Boylan consulting

Engineering & Environmental

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

MAIN BODY

FOR

Hibernia Steel (Manufacturing) Limited

FOR

Proposed Galvanising Facility at Mell, Drogheda, Co. Louth

May 2023

Summary of Document Revisions			
Rev No.	**Date Revised**	**Section Revised**	**Revision Description**

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1 INTRODUCTION

1.1 General

Boylan Consulting has been appointed by Hibernia Steel (Manufacturing) Limited to prepare an Environmental Impact Assessment Report (EIAR) for a proposed hot dip galvanising facility at Mell, Drogheda, County Louth.

This chapter of the EIAR was prepared on behalf of Boylan Consulting by Steven Peck, BA (Hons), MA, MRTPI, and approved by Cathal Boylan, BEng. (Hons) Engineering, Director at Boylan Consulting. Steven Peck is a Chartered Town Planner with significant experience in EIA projects including large infrastructure and urban development projects. As Director at Boylan Consulting Cathal Boylan has overseen numerous EIA projects, and prior to setting up Boylan Consulting Cathal Boylan worked as a Project Manager with ESB International, on numerous applications for large scale infrastructural projects many of which were supported by the EIA process. Cathal is a Chartered Engineer and is a member of Engineers Ireland.

This EIAR accompanies an application for planning permission and an application for an Industrial Emissions Licence.

1.2 EIA Legislation and Guidance

Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment was adopted in June 1985. The 1985 Directive was amended by Directives 97/11/EC, 2003/35/EC and 2009/31/EC, and the Directive and its amendments were codified in 2011 by Directive 2011/92/EU, which was amended by Directive 2014/52/EU. This legislation has been transposed into relevant Irish statutory provisions.

This EIAR has been prepared in accordance with the relevant legislative requirements and over-arching guidance within the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (published May 2022), Department of Housing, Planning and Local Government Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessment (published August 2018), European Commission Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (published November 2017), European Commission Environmental Impact Assessment of Projects: Guidance on Scoping (published November 2017) and the former Department of the Environment, Heritage and Local Government Development Management Guidelines for

Planning Authorities (published June 2007). In addition, the individual chapters of this EIAR should be referred to for further information on guidance consulted by the relevant contributing consultants.

1.3 Objectives of EIA

The central purpose of Environmental Impact Assessment is to carry out assessment of likely and significant effects on the environment of a project in parallel with project design and to document the process in an EIAR which is submitted to the consenting authority in order to inform a decision on whether the project should be permitted to proceed.

The Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports sets out the following fundamental principles to be followed when preparing an EIAR:

- Anticipating, avoiding and reducing significant effects
- Assessing and mitigating effects
- Maintaining objectivity
- Ensuring clarity and quality
- Providing relevant info to decision makers
- Facilitating better consultation.

This EIAR details the results of the EIA process which was carried out on parallel with project design. The EIA process will be completed by the consenting authorities (Louth County Council / An Bord Pleanála in the case of the application for planning permission and the Environmental Protection Agency in the case of the application for an Industrial Emissions Licence. The consenting authorities will be required to assess the effects of the development on the environmental factors set out within the EIA legislation, which are:

- Population and human health;
- Biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive;
- Land, soil, water, air and climate;
- Material assets, cultural heritage and the landscape; and
- The interaction between the forgoing factors.

This EIAR details the assessment process for these factors in respect of the proposed development. Assessment is also provided as to any significant effects on the environment derived from the vulnerability of the proposed development to risks of major accidents and / or disasters that are relevant to the development, as required by EIA legislation (see Section 1.2).

The EIAR sets out mitigation measures aiming to avoid / prevent / reduce where appropriate any significant adverse effects identified as likely to occur as a result of the proposed development.

The EIAR sets out a description of alternatives to the development proposals which were studied and an indication of the main reasons for selecting the chosen option.

It is intended that the EIAR will assist the consenting authorities, statutory consultees and the public in assessing the development proposals.

1.4 Format of EIAR

This EIAR consists of:

- Non-technical summary
- Main body
- Appendices

1.4.1 Volume 1 - Non-technical summary

The non-technical summary is a summary of the content of the EIAR, written in non-technical language.

1.4.2 Volume 2 - Main body

Chapter 1 sets out the introduction to the EIAR including the objectives of EIAR, its regulatory context, the format of the EIAR, details of the project team, details of EIA screening and EIAR scoping, the justification for the project, difficulties encountered and assumptions made.

Chapter 2 sets out a detailed description of the project and proposed development site.

Chapter 3 sets out alternatives to the development proposals studied and reasons for the option selected

Chapters 4-12 set out assessments in respect of environmental topics as follows:

- Population and Human Health
- Biodiversity
- Cultural Heritage
- Land, Soils and Geology
- Water
- Traffic and Transportation
- Noise

- Air Quality and Climate
- Landscape and Visual Impact
- Material Assets
- Interaction of the Foregoing

For clarity, consistency and ease of reference, generally the following structure is used within chapters 4-12:

- Introduction
- Methodology
- Characteristics of the Development
- Receiving Environment
- Impacts of the Development
- Mitigation measures
- Monitoring Measures
- Residual Impacts
- Interactions with Other Impacts

Identified effects are described in accordance with guidance within Table 3.4 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, which is reproduced in Figure 1-1.

Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative or neutral	**Positive Effects** A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Describing the Significance of Effects "'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see *Determining Significance* below.).	**Imperceptible** An effect capable of measurement but without significant consequences.
	Not significant An effect which causes noticeable[2] changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	**Extent** Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision.	**Likely Effects** The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	**Momentary Effects** Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day
	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years
	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

Describing the Types of Effects	**Indirect Effects (a.k.a. Secondary Effects)** Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do-Nothing Effects' The environment as it would be in the future should the subject project not be carried out.
	`Worst case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

Figure 1-1 Reproduction of Table 3.4 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, which provides guidance on descriptions of effects

1.4.3 Volume 3 – Appendices

Relevant supporting information is provided within the Appendices.

1.5 Project team

Boylan Consulting has led the preparation of this EIAR with the assistance of specialist environmental consultants who have undertaken specific assessments as part of their evaluation of the project.

Directive 2011/92/EU, as amended by Directive 2014/52/EU, states in relation to the persons responsible for preparing EIARs that 'Experts involved in the preparation of environmental impact assessment reports should be qualified and competent.'

To demonstrate compliance with this requirement and in line with best practice Table 1-1 sets out the names of the environmental consultants which have prepared each element of the EIAR and lists their qualifications and summarises their relevant competence and experience.

Boylan Consulting trade as both an engineering and environmental consultancy. With a staff of 13 comprising both environmental scientists and engineers the Company has been providing environmental solutions to industry since 2006.

Boylan Consulting has significant experience in carrying out environmental impact assessments and the preparation of EIARs and has successfully defended assessments in An Bord Pleanála oral hearings. Prior to setting up Boylan Consulting, director Cathal Boylan, worked as a Project Manager with ESB International, on numerous planning applications for large scale infrastructural projects, many of which were supported by the EIA process.

Table 1-1 Names of the environmental consultants which have prepared each part of the EIAR, their qualifications and summaries of their relevant competence and experience.

Consultant	EIAR Part(s) Prepared
Boylan Consulting, Main St. Mullagh, Kells, Co. Meath. Tel: 046 928 6000 E-mail: info@boylanengineering.ie EIAR chapters 1 Introduction, 3 Alternatives, 4 Population & Human Health and 14 Interactions of the Foregoing, and the Introduction, Alternatives, Population & Human Health and Interactions of the Foregoing sections of the Non-Technical Summary, were prepared on behalf of Boylan Consulting by Steven Peck, BA (Hons), MA, MRTPI, and approved by Cathal Boylan, BEng. (Hons) Engineering, Director at Boylan Consulting. Steven Peck is a Chartered Town Planner with significant experience in EIA projects including large infrastructure and urban development projects. As Director at Boylan Consulting Cathal Boylan has overseen numerous EIA projects, and prior to setting up Boylan Consulting Cathal Boylan worked as a Project Manager with ESB International, on numerous planning applications for large scale infrastructural projects many of which were supported by the EIA process. Cathal is a Chartered Engineer and is a member of Engineers Ireland.	• **Chapter 1** Introduction • **Chapter 3** Alternatives • **Chapter 4** Population & Human Health • **Chapter 14** Interactions of the Foregoing • Introduction, Alternatives, Population & Human Health and Interactions of the Foregoing sections of the Non-Technical Summary
Boylan Consulting, Main St. Mullagh, Kells, Co. Meath. Tel: 046 928 6000 E-mail: info@boylanengineering.ie EIAR Chapter 2 Project Description, and the Project Description section of the Non-Technical Summary were prepared by Niamh Murray (M.Sc. (Biol), Environmental Scientist at Boylan Consulting. Niamh Murray holds an Advanced Diploma in Environmental and Planning Law from Kings Inns and has more than 20 years industrial and consultancy experience in the environmental field.	• **Chapter 2** Project Description • Project Description section of the Non-Technical Summary
Kingfisher Environmental Consultants 4 Silverhill, Kilboglashy, Ballysadare, Co. Sligo Tel: 087 2641979 E-mail: freddiesymmons@hotmail.com EIAR Chapter 5 Biodiversity, and the Biodiversity section of the Non-Technical Summary were prepared by Mr. Freddie P.R. Symmons B.Env.Sc. (HONS) MCIEEM – Senior Environmental Consultant and Ecologist of Kingfisher Environmental Consultants. The author has over 28 years professional experience in the project management and writing of EIS/EIAR documents	• **Chapter 5** Biodiversity • Biodiversity section of the Non-Technical Summary

in Ireland and in Ecological Surveys and Reporting. The author is also a *Full Member of the Chartered Institute of Ecology and Environmental Management.* The author also prepared the Appropriate Assessment Natura Impact Statement which accompanies this proposed development.	
Dr. Charles Mount charles.mount@gmail.com Tel: 045 485 812 E-mail: charles.mount@gmail.com EIAR Chapter 6 Cultural Heritage, and the Cultural Heritage section of the Non-Technical Summary were prepared by Dr. Charles Mount who is a member of the Institute of Archaeologists of Ireland and a member of the Discovery Programme and has more than thirty years of cultural heritage assessment experience. He holds M.A. and Ph.D. degrees in archaeology as well as a professional diploma in EIA and SEA Management.	• **Chapter 6** Cultural Heritage • Cultural Heritage section of the Non-Technical Summary
Envirologic Ltd. Robertson House, Unit 49 Baldoyle Industrial Estate, Baldoyle, Dublin 13. Tel: 087 202 4695 info@envirologic.ie EIAR Chapter 7 Land, Soils and Geology, and the Land, Soils and Geology section of the Non-Technical Summary were prepared by Colin O'Reilly PhD (Hydrology) and Eoin Moorhouse BSc of Envirologic Ltd. Dr. Colin O'Reilly has a doctorate degree in soils systems and hydrology. He has over 15 years of professional and field-based experience as a hydrogeologist coupled with a primary degree in agricultural science which was followed by a doctorate degree in hydrology, awarded by the Centre for Water Resources Research, School of Architecture, Landscape and Civil Engineering, UCD, while a recipient of a Teagasc Walsh Fellowship. Envirologic has key competencies in hydrogeology and hydrology. Colin is a current and active member of Engineers Ireland and International Association of Hydrogeologists (Irish Group). Eoin Moorhouse is employed by Envirologic as a graduate hydrologist. Eoin has a primary degree in Marine Science which was followed by two years working in a Galway-based private consultancy. Eoin has experience of EIAR preparation and as part of this chapter was responsible for site work and GIS mapping.	• **Chapter 7** Land, Soils and Geology • Land, Soils and Geology section of the Non-Technical Summary
Envirologic Ltd. Robertson House, Unit 49 Baldoyle Industrial Estate, Baldoyle, Dublin 13. Tel: 087 202 4695 info@envirologic.ie EIAR Chapter 8 Water, and the Water section of the Non-Technical Summary were prepared by Colin O'Reilly PhD (Hydrology) and Eoin Moorhouse BSc of Envirologic Ltd. Dr. Colin O'Reilly has a doctorate degree in soils systems and hydrology. He has over 15 years of professional and field-based experience as a hydrogeologist coupled with a primary degree in agricultural science which was followed by a doctorate degree in hydrology, awarded by the Centre for Water Resources Research, School of Architecture, Landscape and Civil Engineering, UCD, while a recipient of a Teagasc Walsh Fellowship. Envirologic has key competencies in hydrogeology and hydrology. Colin is a current and active member of Engineers Ireland and International Association of Hydrogeologists (Irish Group). Eoin Moorhouse is employed by Envirologic as a graduate hydrologist. Eoin has a primary degree in Marine Science which was followed by two years working in a Galway-based private consultancy. Eoin has experience of EIAR preparation and as part of this chapter was responsible for site work and GIS mapping.	• **Chapter 8** Water • Water section of the Non-Technical Summary

PMCE Limited Unit 17, Greenmount House Greenmount Office Park, Harold's Cross Rd, Harold's Cross, Dublin 6W, Co. Dublin, D6W VX78 info@pmceconsultants.com EIAR Chapter 9 Traffic and Transportation, and the Traffic and Transportation section of the Non-Technical Summary were prepared by Mr Aly Gleeson and Mr Antonis Papadakis of PMCE Ltd, which is a civil engineering consultancy based in Co. Dublin, and specialises in Transport and Road Safety Engineering. Aly Gleeson is a Chartered Civil Engineer, Fellow of Engineers Ireland, and a Director of PMCE with over 20 years' post-graduate experience. His engineering background includes delivery of major international projects, local authority safety schemes, bus & cycle projects, and residential developments. Aly has developed his background in engineering to include Traffic and Transport Assessments, Design projects and Road Safety Audits. This has involved working with large construction clients, specialised design consultancy's, local authorities, and Transport Infrastructure Ireland. Antonis Papadakis is a Project Engineer with PMCE specialising in Traffic and Transportation Engineering. Antonis' has experience in both Traffic Modelling and Junction Capacity Analysis following extensive work on a variety of traffic projects. His traffic engineering background includes a variety of projects such as quarries, mines, hotels, residential, commercial and community developments.	• **Chapter 9** Traffic and Transportation • Traffic and Transportation section of the Non-Technical Summary
Fitzsimons Walsh Environmental Limited 85 Lansdowne Park, Ennis Road, Co. Limerick, Limerick Tel: 087 798 0201 E-mail: oliver@fitzsimonswalshenvironmental.com EIAR Chapter 10 Noise, and the Noise section of the Non-Technical Summary were prepared by Mr. Oliver Fitzsimons MSc, BSc Environmental Science. Mr Fitzsimons has over 20 years of experience preparing noise impact assessments.	• **Chapter 10** Traffic and Transportation • Traffic and Transportation section of the Non-Technical Summary
Odour Monitoring Ireland, Unit 32, DeGranville Court, Dublin Rd, Trim, Co. Meath, Ireland Tel: 086 855 0401 E-mail: info@odourireland.com EIAR Chapter 11 Air Quality and Climate, and the Air Quality and Climate section of the Non-Technical Summary were prepared by Dr. Brian Sheridan B.Sc. (Hons), M.Sc. Eng. Ph.D. Eng. director of Odour Monitoring Ireland Ltd.	• **Chapter 11** Air Quality & Climate • Air Quality and Climate section of the Non-Technical Summary
Mullin Design Associates 559 Ormeau Rd, Rosetta Ave, Down, Belfast BT7 3JA, United Kingdom Tel: 0777 575 2010 info@mullin.ie EIAR Chapter 12 Landscape and Visual Impact, and the Landscape and Visual Impact section of the Non-Technical Summary were prepared by Mullin Design Associates, Chartered Landscape Architects. The assessment was completed by Pete Mullin, BA (Hons) CMLI, MILI Chartered Landscape Architect and principal of Mullin Design Associates. Pete has produced several hundred Landscape and Visual Impact Assessments during over 25 years in the profession.	• **Chapter 12** Landscape and Visual Impact • Landscape and Visual Impact section of the Non-Technical Summary

Boylan Consulting, Main St. Mullagh, Kells, Co. Meath. Tel: 046 928 6000 E-mail: info@boylanengineering.ie EIAR Chapter 13 Material Assets, and the Material Assets section of the Non-Technical Summary were prepared by Alwyn Flaws, Chartered Civil Engineer of Boylan Consulting. Alwyn Flaws has a Higher Diploma in Science for Civil Engineering and Construction a Batchelor degree of Engineering Civil and Transportation Engineering and Flood Risk Assessment and a Master degree of Science Construction Project Management.	• **Chapter 13** Material Assets • Material Assets section of the Non-Technical Summary

1.6 Screening stage

The purpose of the screening stage is to determine if EIA is required for the project. It has been identified that an EIA is required as the proposed development would exceed the relevant threshold(s) under Class 4 (b) (ii) of the Planning and Development Regulations 2001 as amended - *'Installations for the processing of ferrous metals - application of protective fused metal coats, where the production area would be greater than 100 square metres'.*

The proposed facility will also require an Industrial Emissions Licence (IED), which will be acquired through an application to the Environmental Protection Agency. This EIAR shall accompany the application. The requirement for IED comes from the Industrial Emissions Directive (Directive 2010/75/EU).

The First Schedule of the EPA Act, 1992 (as amended) specifies activities for which IED is required. The proposed development exceeds the relevant threshold for IED under Class 3.2.1 (c) - *'The processing of ferrous metals -application of protective fused metal coats with an input exceeding 2 tonnes of crude steel per hour.'*

1.7 Scoping stage

The Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports sets out at Guidelines Section 3.3.1 that '"Scoping" is the process of deciding what information should be contained in an EIAR, and what methods should be used to gather and assess that information.' The European Commission Environmental Impact Assessment of Projects: Guidance on Scoping sets out at Page 6 that Scoping comprises 'The process of identifying the content and extent of the information to be submitted to the Competent Authority under the EIA process'.

The scope of this EIAR was informed by the following:

- The requirements of EIA legislation
- Over-arching guidance within the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports , Department of Housing, Planning and Local Government Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessment, European Commission Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report, European Commission Environmental Impact Assessment of Projects: Guidance on Scoping and the former Department of the Environment, Heritage and Local Government Development Management Guidelines for Planning Authorities, together with further guidance as consulted by the relevant contributing consultants, as set out within the individual chapters of this EIAR.
- The provisions of the National Planning Framework (2018) and Eastern and Midland Regional Spatial and Economic Strategy (2019)
- The provisions of the Louth County Development Plan 2021-2027
- The nature, location and scale of the proposed development; the existing environment including any sensitive features / land uses; and any likely significant impacts of the proposed development on the environment.
- The results of pre-planning consultation undertaken with Louth County Council. Refer to Appendix 2.
- Scoping letters, documenting a brief outline of the proposed development, were issued to the statutory consultees listed below. Copies of the scoping letters are provided in Appendix 3A.
    - Environmental Protection Agency
    - Irish Water
    - Inland Fisheries Ireland
    - An Taisce
    - Fáilte Ireland
    - National Parks & Wildlife Services
    - Transport Infrastructure Ireland
    - Office of Public Works
    - Waterways Ireland
    - Louth County Council
    - Department of Culture, Heritage & An Ghaeltacht
    - The Heritage Council

  - Health & Safety Authority
  - Geological Survey Ireland
  - Health Services Executive
- Feedback from consultation invitations are included in Appendix 3B. Feedback detail has been considered in the environmental impact assessment.

1.8 Justification for project

The proposed development is anticipated to lead to the creation of approximately 110 jobs. In this regard the proposed development will support national and regional strategic planning outcomes for a strong economy, supported by enterprise, innovation and skills. Indigenous employment generating investment is supported by the Louth County Development Plan 2021-2027 ('the Development Plan') and Louth Local Economic and Community Plan 2016-2022.

It is considered that the proposed development accords with strategic spatial strategies for growth at national, regional and local levels. In this regard it is highlighted that:

- At national level, it is considered that the proposed development supports the development of the Drogheda Regional Centre in accordance with National Planning Framework policy objectives 2b and 7.
- At regional level, it is considered that the proposed development accords with Eastern and Midland Region Regional Spatial and Economic Strategy Regional Policy Objective 4.14 for the Drogheda Regional Growth Centre in respect of promoting self-sustaining economic and employment-based development opportunities to match and catch-up on rapid phases of housing delivery in recent years to provide for employment growth and reverse commuting patterns, and Regional Policy Objective 4.18 for the Drogheda Regional Growth Centre in respect of developing new industry on suitable sites to enhance Drogheda's role as a strategic employment centre on the Dublin-Belfast Economic Corridor and provide for employment opportunities.
- At local level, the proposed development is considered as located within the Northern Environs of Drogheda as referenced in the Development Plan[1]. The Development Plan states that the development of the employment and residential lands in the Northern Environs are a fundamental element of the immediate and long-term growth strategy for the town (Development Plan Section 2.13.2). The Development Plan states that the land bank will act

[1] The Northern Environs as referenced in the Development Plan does not appear as defined in the Development Plan however the term is assumed as referring to the lands which were the subject of the now superseded North Drogheda Environs Local Area Plan 2004.

as a counter balance to the level of growth that has taken place in the Southern Environs of the town (Development Plan Section 2.13.6). The Northern Environs is considered to contain two areas of undeveloped lands zoned for employment uses, located within the west and east of the Northern Environs area, respectively. In view of this, it is considered that it follows that employment development on the undeveloped lands zoned for employment uses within the west of the Northern Environs – including the application site – is a fundamental element of the immediate growth strategy for Drogheda, particularly as it is considered that the Development Plan indicates (Development Plan Section 5.12.4) there is at present no funding available for completion of the Port Access Northern Cross Route (a road project) as far as the undeveloped lands zoned for employment uses in the east of the Northern Environs, or the water services infrastructure to provide for the release of these lands.

- The application site is provided by IDA Ireland and comprises part of lands at this location to be developed as an IDA Ireland business park (see Section 2.2).
- Pre-planning consultation was undertaken with Louth County Council (see Section 1.7) in respect of zoning policy and Louth County Council advised that the principle of the proposal at this location is acceptable.
- It is also highlighted that the application site context includes (see also Section2.2) uncompleted access roads and other infrastructure installed on foot of planning permission Reg. Ref.: 071435 / An Bord Pleanála Ref.: PL15.228184 which were intended to serve lands in this area including the application site, representing significant prior investment in this area, and it is considered that the proposed development represents an opportunity to utilise some of this infrastructure, and it is considered that these are positive considerations in respect of the location of the proposed development.

The proposed development has been brought forward in accordance with an EIA process aiming to ensure a high level of protection of the environment and public health.

1.9 Cumulative effects

Directive 2014/52/EU and Schedule 6 to the Planning and Development Regulations 2001 as amended require that EIARs contain a ‘description of the likely significant effects of the project on the environment resulting from the cumulation of effects with other existing and / or approved projects’. In relation to this criterion, the Checklist for Information Required to Describe Effects at Table 3.5 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports includes that the EIAR should have ‘considered cumulative effects due to cumulation of effects with those of other projects that are existing or are approved but not yet built or operational'. A relevant assessment in line with these requirements is included in each of the following chapters 4-13.

This EIAR also takes into account cumulative effects arising from the interaction between the various impacts within the proposed project. (While not expressly required by EIA legislation, this has been clarified by the Court of Justice of the European Union (see Section 1.4.3 of the European Commission Guidance on the Preparation of the Environmental Impact Assessment Report)).

1.10 Difficulties encountered

Any difficulties encountered in compiling the information in this EIAR are set out within the relevant sections of the EIAR. No difficulties were encountered in compiling this chapter of this EIAR.

1.11 Uncertainties involved

Any uncertainties involved in the assessment within this EIAR are set out within the relevant sections of the EIAR. No uncertainties pertained to the preparation of this chapter of this EIAR.

1.12 Bibliography

Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency, May 2022.

Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessment, Department of Housing, Planning and Local Government, August 2018.

Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report, European Commission, November 2017.

Environmental Impact Assessment of Projects: Guidance on Scoping, European Commission, November 2017.

Development Management Guidelines for Planning Authorities, former Department of the Environment, Heritage and Local Government, June 2007.

National Planning Framework, Department of Housing, Planning and Local Government, February 2018.

Eastern and Midland Regional Spatial and Economic Strategy, Eastern and Midland Regional Assembly, June 2019.

Louth County Development Plan 2021-2027, Louth County Council, November 2021.

Louth Local Economic and Community Plan 2016-2022, Louth County Council, March 2016.

2 PROJECT DESCRIPTION

2.1 Introduction

This chapter was prepared by Niamh Murray (M.Sc. (Biol), Environmental Scientist at Boylan Consulting. She holds an Advanced Diploma in Environmental and Planning Law from Kings Inns and has more than 20 years industrial and consultancy experience in the environmental field.

Hibernia Steel (Manufacturing) Limited are preparing a planning application to construct and operate a hot-dip galvanising facility with zinc kettle at Mell, Drogheda, Co. Louth.

It is planned to process up to 36,000TPA of steel at the plant (it may be less in the first couple of years of operation). All impact assessments have been completed on a worst-case-scenario basis i.e. on the assumption that maximum processing takes place from year 1.

Processing will be conducted in-doors. There will be some storage of steel, both processed and non-processed, out-doors.

In summary the proposal includes:

- Construction of a main building with an approximate gross floor area of 5719m^2. The building contains
    - (i) 'black material' (unprocessed material) jigging area (in-take area)
    - (ii) Pre-treatment area
    - (iii) Galvanising (treatment) area
    - (iv) Galvanised material unjigging area (out-take area)
    - (v) Services area
    - (vi) Staff welfare facilities (2 storey over basement)
- Construction of 2 No. stacks to extract flue gases from the main and stand-by furnaces respectively. These will be located on the roof at a height of 20 m above finished floor level (or 63 m aOD).
- Construction of 1 No. stack to extract white fumes from the zinc kettle. Exhaust air will be filtered through bag filters. filtered air from the bag filters will then be exhausted to air at 20 m above finished floor level (or 63m aOD).
- Construction of 1. No. stack to extract exhaust air from the pre-treatment area. Acid vapours produced in the pre-treatment area are passed through a scrubber prior to discharge to air. This stack will be located at 20 m above finished floor level (or 63 m aOD).

- Construction of ESB sub-station within the main building.
- Installation of 2 no. LPG storage tanks.
- Installation of double weighbridge.
- Construction of office building (2 storeys) with an approximate gross floor area of 298m^2.
- Provision of trailer and truck parking spaces.
- Provision of 110 no. visitor and staff parking areas, 2 of which are wheelchair accessible and 7 of which are EV charging locations.
- Provision of 20 no. staff and visitor bicycle parking.
- Provision of concrete yard and additional hardcore yard.
- Installation of stormwater management system.
- Installation of 2 No. rainwater harvesting tanks.
- Construction of soil berm.
- Landscaping works.
- Firewater retention infrastructure.
- Provision of vehicular and pedestrian entrance to the facility, site security fencing and entrance walls and gates.

2.1.1 Company history

Hibernia Steel is a family-run, independent steel supplier. They have been in business since 1990 and are based in Grangegeeth, Slane, Co. Meath. They currently supply, cut and drill steel for commercial and domestic customers. They are a significant steel supplier in Ireland, offering services to commercial, manufacturing, agricultural and residential markets.

The proposed development is for a galvanising plant which will complement the existing business.

2.2 Site location

It is proposed to locate the facility at Mell, Drogheda, Co. Louth.

The site is located approx. 2.5Km to the north west of Drogheda town centre. Refer to Figure 2-1 for site location map. Figure 2-2 shows the site of the proposed development in it's geographical context. The site is 3.419Ha in size.

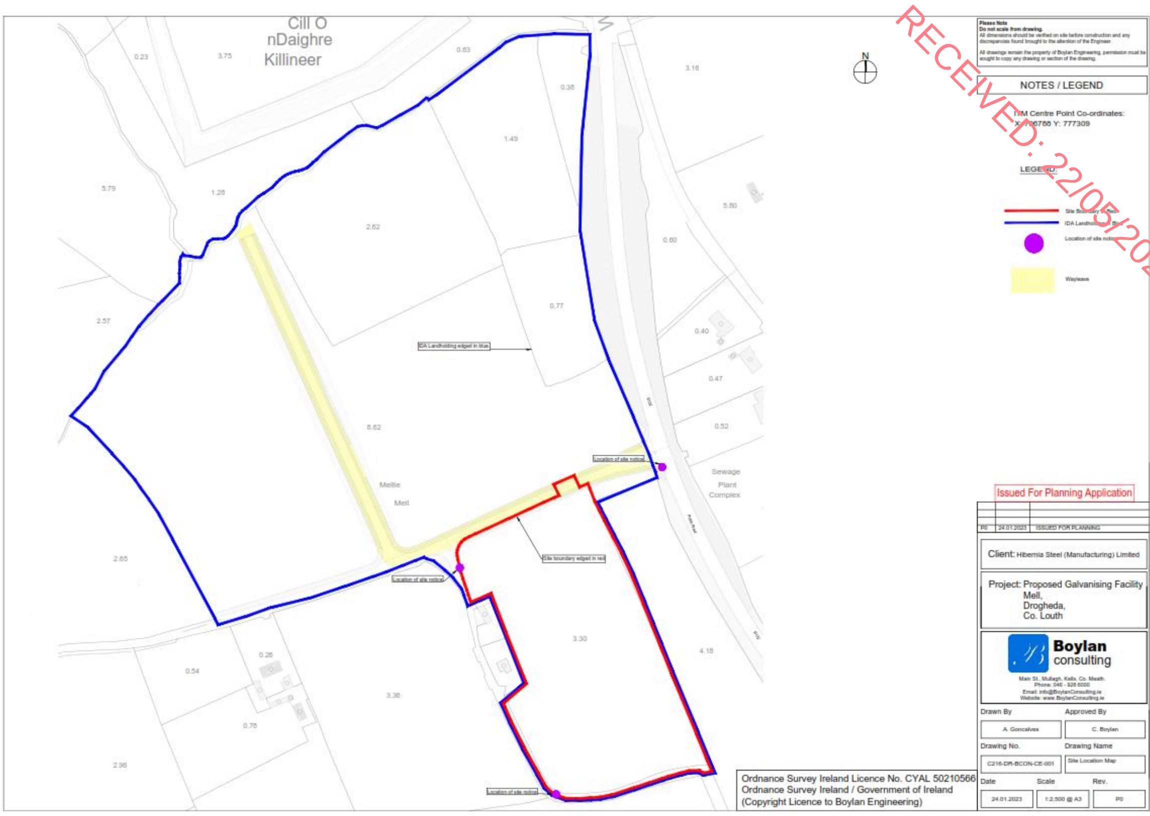

Figure 2-1 Site Location Map

Figure 2-2 Site Location in Geographical Context (Source: AutoCAD drawing)

The proposed site is located in an area zoned 'General Employment' in the Louth County Development Plan 2021-2027 and is within a larger land holding owned by the IDA. Some roads and minor infrastructural works have been previously carried out (but not completed) within the wider IDA landholding (prior to its acquisition by the IDA), with a view to developing a business park. The proposed site comprises part of lands to be developed as an IDA business park.

The proposed works are not located within a potential flood risk area and there are no indicators to suggest that any part of the application site may be at risk of flooding.

Surrounding lands are currently used predominantly for agricultural purposes.

2.3 Physical characteristics

2.3.1 Site description

The site of the proposed development is 3.419Ha. The site is unused and comprises primarily overgrown land. There is an existing concrete pad 164m^2 in the north eastern corner of the proposed site, presumably developed with the previous minor infrastructural works carried out within the wider IDA landholding (prior to acquisition by the IDA). There are 2 residential properties located adjacent to the western boundary. A minor road known as Chapel Lane (L6323) runs along the western and southern boundary. The site is bounded to the north by a part-built (currently closed) access road linking Chapel Lane to the R132, which will be completed as part of the IDA's plans for the wider lands at this location. The site is bounded to the east by an open field.

The site itself is overgrown with small trees, grasses and brambles. There are existing hedgerows along the eastern, southern and part of the western boundary. The site is completely open along the northern boundary. There are footpaths along the access road linking Chapel Lane to the R132. There are overhead power cables traversing the site.
In terms of topography, the site is elevated at the northern end compared to the southern end. There is a level difference of almost 10m across the site from north to south.

2.3.2 Proposed Buildings & Site layout

The current site layout is provided in the Existing Site Layout Drawing (Ref. C216-DR-BCON-CE-002) and the proposed layout is provided in Proposed Site Layout (C216-DR-BCON-CE-003). Drawings are provided in Appendix 1.

The main building has a gross floor area of 5719m^2 and is divided into three main sections

- In-take/out-take section at the southern end of the building. This is single storey and has a maximum height above finished ground level of 14.55m.
- Processing & services area at the northern end of the building. This is also single storey with maximum height above finished ground level of 17.30m. The processing area is the area where the steel is pre-treated and galvanised. The services area is where the chemicals are stored, mixed and distributed from. It also contains air abatement infrastructure (acid vapour scrubber & white fumes bag filters) and control panels.
- Welfare facilities, located at northeastern corner.

The building has been orientated to take advantage of the natural topography of the site. The proposed building heights are for operational reasons and to accommodate required equipment.
The office building is a 2-storey building with a gross floor area of (298m^2) and is provided close to the site entrance.
All built structures will be finished in dark / muted colours.

Hardstanding around the main building consists of an inner area of concrete and an outer gravelled area. Both processed and unprocessed steel will be stored in the gravelled area. The car park is surfaced with asphalt roadways and permeable hardstanding parking spaces (allowing for infiltration of storm water from the northern portion of the site. Refer to Section 2.3.6 below and Chapter 13 (Material Assets) of this EIAR for further information in relation to the storm water management system).

The entrance to the proposed development is from the access road linking Chapel Lane to the R132 along the north western boundary. This access road is currently closed and in a part-built state. The access road and its junction with the R132 road will be completed as part of IDA Ireland's plans for the wider lands at this location, and these works do not comprise part of the subject application proposals. In this regard, IDA Ireland has advised it will be carrying out an entire infrastructure enhancement project, which is endorsed by the IDA Board and capital expenditure plans in 2023. IDA Ireland has advised it has published its tender to complete the works (closing date 31st May 2023), and forecasts completion of the works in early Q1 2024.

Parking spaces are provided along the northern portion of the site. There are 110 visitor & staff car parking spaces. This includes 7 EV charging points and 2 wheelchair accessible parking spaces. Bicycle parking is also provided. There is also truck and trailer parking spaces along the northwestern side of the main building.

A double weighbridge is provided to weigh in-coming and out-going loads of steel.

A 3m high soil berm (from finished ground level on the Hibernia side) and a further 1 m high impermeable fence is provided along the western boundary which will reduce potential visual or noise impacts on adjacent residences.

It is proposed to landscape the entire site. Refer to Landscaping Plan (MDA Dwg.23.10.100' in Appendix 4).

2.3.3 Site Access

The entrance to the proposed development is along the northern boundary from the access road linking Chapel Lane to the R132. Construction and operational traffic from the proposed development will use the access road linking Chapel Lane to the R132 to access the R132, and the proposed development will be accessed from the R132 only i.e. no traffic from the facility will use Chapel Lane.

Pedestrian access is also provided to / from the access road linking Chapel Lane to the R132.

2.3.4 Plant & equipment

A detailed description of the process and equipment is provided in the Process Flow Drawing (Ref.: C216-DR-BCON-CE-203 Process Flow Drawing).

In summary the processing equipment consists of:

1. Overhead cranes & monorails for the movement of steel
2. Racks for storing 'black' (unprocessed) steel and galvanised steel
3. 12 No. pre-treatment tanks/baths for stripping and degreasing the steel prior to galvanising
4. Acid vapour scrubber for treatment of acid vapours from the pre-treatment operations. Treated vapours are discharged to air.
5. Heating units for pre-treatment tanks
6. Acid storage tanks
7. Waste acid storage tanks
8. Mixing & dosing units
9. Flux recycling & regenerating unit
10. Drier
11. Zinc kettle (14.5m x 1.8m x 3m)
12. Gas furnace and stand-by furnace
13. Flue gas economiser & ventilator
14. Flue gas exhausting chimney
15. Cooling tower
16. Quench/passivation tank
17. White fumes filter bags and exhaust

Refer to Section 2.4.1 for further information on the galvanising process.

Ancillary plant and equipment includes:

1. Diesel forktrucks for handling and transport of materials
2. Double weighbridge

3. Buildings
4. Site offices
5. Stormwater management infrastructure
6. Fire water retention infrastructure
7. Security gate & fencing
8. Rainwater harvesting tanks

2.3.5 Services

Electrical power, lighting and space heating will be provided via the electricity network. The installed capacity requirements for the site is 950kVa. This refers to the installed power and not to the effective/average consumption. It is expected that the absorbed value will be approximately half of the installed one because all of the equipment will not be used concurrently. The facility will consume approximately 810,000kWh/yr of electrical power. An ESB substation will be constructed within the main building.

Liquid petroleum gas (LPG) will be used to fuel the furnace for heating the zinc kettle, pre-treatment tanks and drier. LPG will be stored on site in 2 No. 2T tanks. 720,000m^3 gas per annum will be consumed by the facility.

Domestic wastewater generated at the facility will be connected to the Irish Water sewer system. The subject application proposals include for foul water services within the application site as far as the application site boundary. Onward connection between the wider IDA lands and the Irish Water network will be completed as part of IDA Ireland's plans for the wider lands at this location, and these works do not comprise part of the subject application proposals.

Potable water will be supplied from the public mains. The subject application proposals include for water services within the application site as far as the application site boundary. Onward connection between the wider IDA lands and the Irish Water network will be completed as part of IDA Ireland's plans for the wider lands at this location, and these works do not comprise part of the subject application proposals. Non-potable water is supplied from rainwater harvesting and from public mains. Where available, rainwater will be used for toilets and process water. Refer to Proposed Water Main Layout drawing in Appendix 1 (ref. C216-DR-BCON-CE-102).

Firefighting water will be obtained from hydrants from the potable water supply, discussed above.

Fuel for mobile plant (forktrucks) is stored within a bunded area, and there are appropriate spill kit materials available on-site.

In respect of IDA Ireland's plans for the wider IDA lands at this location mentioned above, IDA Ireland has advised it will be carrying out an entire infrastructure enhancement project, which is endorsed by the IDA Board and capital expenditure plans in 2023. IDA Ireland has advised it has published its tender to complete the works (closing date 31st May 2023), and forecasts completion of the works in early Q1 2024.

Further information in relation to services is available in Chapter 13 Material Assets.

2.3.6 Storm water management

The storm water management design is provided in the Proposed Drainage Layout Drawing in Appendix 1 (Ref.: C216-DR-BCON-CE-101).

Infiltration rates in the northern portion of the site are favourable. The catchment consisting of the upper portion of the site (from the northern gable of the shed heading north) is managed by infiltration to ground as the infiltration rates in this area are suitable. There are two proposed mediums/methods of infiltration;

- Permeable parking bays designed to manage 100 year +20% climate change. Satisfying 24-hour half drain time.
- SC310 Stormtech units dealing with upper concrete yard and asphalt entrance road, designed to manage 100 year +20% uplift for climate change. Satisfying 24-hour half drain time.

Any runoff from roads and yard will pass through an appropriately sized full retention interceptor.

Clean roofwater will be captured in rainwater harvesting tanks and used in toilets and for processing purposes.

The infiltration rates at the lower (southern) end of the site are much poorer than in the upper portion of the site and it is therefore proposed to use a concrete attenuation tank with a controlled discharge to the drain that runs along the southern edge of the site. The system is designed to discharge at a rate of 13.5 l/s and is designed to ensure the run-off post development is similar to that prior to development. The attenuation tank is 380m^3 and is sized to manage 100 year event +20% uplift for climate change. All run-off from the concrete yard passes through an appropriately sized full retention interceptor prior to discharge to the attenuation tank. All discharge from the attenuation tank is controlled via a Hydrobrake. A shut off valve will be installed after each interceptor to withhold surface water run-off during a potential contamination event.

2.4 Characteristics of the project – general

2.4.1 Description of activities - Main activity

Galvanising is the process of applying a protective zinc coating to steel or iron, to prevent rusting. The proposed (and most common) method is hot-dip galvanising, in which the parts are submerged in a bath of hot molten zinc. A detailed description of the process and equipment is provided in the Process Flow Drawing in Appendix 1 (Ref.: C216-DR-BCON-CE-203 Process Flow Drawing).

It is proposed to process a maximum of 36,000 Tonnes of steel per annum. Production will start on a phased basis, with 12,000 tonnes per annum during year 1 of production and increasing to a maximum of 36,000 tonnes per annum by Year 3. All assessments in this EIAR have been based on an annual production capacity of 36,000 Tonnes per annum from year 1.

In general the galvanising process consists of the following steps:

- Stripping (acid bath) (HCl) to remove zinc and other impurities
- Degreasing (alkaline bath) (TIB Clean-A 300).
- Rinse
- Pickling to remove iron oxides & scales (acid bath) (HCl)
- Rinse
- Fluxing to prepare surfaces for the metallurgical phase by applying a saline layer that facilitates the Iron-Zinc bonding process. (Double salts $ZnCl_2$ & NH_4Cl)
- Galvanising – immersion in molten zinc. Zinc kettle approx. 14.5mx1.8mx3m. The zinc is slowly heated to the melting point of Zn (ca. 450^{0}C) and maintained at that temperature. The Zinc kettle will rarely be shut down.
- Passivation is an optional step to prevent the formation of iron oxides post galvanisation.
- Buffering

The degreaser tank, rinsing tank and fluxing tank all have heating units. The zinc kettle has a high velocity furnace. LPG is used for heating purposes. 2 x 2T LPG tanks will be provided on-site.

Acid vapours from the Process Area are vented through a scrubber prior to discharge to atmosphere.

Flue gases from the gas furnace are passed through a heat economizer and ventilator prior to discharge to the atmosphere.

White fumes (dust) are generated by the immersion of steel into molten zinc. These fumes are segregated inside the hood above the zinc kettle and are sucked by a ventilation system through a bag filter. Filtered air is then discharged to the atmosphere.

2.4.2 Description of activities - Construction stage

The construction phase will be 18 to 24 months in duration and will include

- Site set-up: Securing of the site, setting up a compound/welfare facilities, laydown areas and goal post/bunting to protect existing overhead ESB line and installation of silt fence (or similar)
- Site clearance: removal of shrubs and brambles
- Earthworks: Stripping of topsoil followed by bulk dig and cut/fill operations, construction of soil berm, excavation to suitable formation level, Importation of stone (AMT) for the formation of levels for buildings and yard construction. Top-soil will be stored on-site in sealed piles not exceeding 2m in height to be re-used later for landscaping. Sub-soil will be stored in stockpiles not exceeding 2 m prior to re-using as backfill.
- Installation of underground pipework, interceptors, manholes and all other ancillary infrastructure required for services.
- Construction of foundations.
- Construction of buildings, yards, car parks and all ancillary abatement systems infrastructure.
- Electrical installation
- Pipework installation
- Back-filling, compaction and grading of soils
- Construction of firewater retention wall
- Installation of processing equipment
- Construction of security fencing and installation of gates
- Landscaping

Construction operations shall only be carried out during designated construction hours, which are proposed to be as follows:

Monday to Friday: 8 am to 6 pm

Saturdays: 8 am to 2 pm

2.4.3 Facility management & staffing

There will be approximately 110 people employed at the facility, including management, operatives, staff and drivers when operating at full capacity.

2.4.4 Hours of operation

The proposed opening hours of the facility are 6.30 am to 8.00 pm Monday to Friday and 08.00 am to 01.00 pm on Saturdays.

The processing plant operational hours will be restricted to 07.00 am to 05.00 pm on weekdays. The facility will not be opened on Sundays or bank holidays.

There will also be an additional 10 days of shutdown per annum. This time will be used for general maintenance around the facility.

2.4.5 Oil & chemical storage

Diesel and chemicals will be stored in bunded structures to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area
- 25% of the total volume of the substances stored within the bunded area

Outlined in Table 2-1 is a list of chemicals proposed to be used and stored on site.

Table 2-1 Chemicals proposed to be used & stored on site

Material/Substance	Form	CAS Number	Vol. Stored (fresh) (L)	Vol. stored (waste) (T)	Hazard statement	Nature of use	Named substance
HCl	Liquid	7647-01-0	35,000	2.2	H290/H314/H335	Pre-treatment	Yes
TIB Clean A 300 (Degreaser) - Quaternary ammonium compounds, C12-14-alkyl(hydroxyethyl)dimethyl, ethoxylated, chlorides… Phosphonic acid, (1- hydroxyethylidene) bis-sodium hydroxide	Liquid	68439-46-3/1554325-20-0/2809-21-4/1310-73-2	5,000	N/A	N/A	Pre- treatment	No
LPG	Gas	68476-85-7		N/A	N/A	Fuel	Yes
Waste Pickling Acid (HCl, $FeCl_2$, $ZnCl_2$)	Liquid	7647-01-0/7758-94-3/7646-85-7	N/A	70,000	H290/H302/H314	Waste generated	Yes
TIB Flux D S700 (Flux) – Zinc Chloride & Ammonium Chloride	Liquid	7646-85-7/12125-02-9	6,000	N/A	N/A	Pre-treatment	No
High Hydrated Lime - Calcium dihydroxide	Solid	1305-62-0	5,000		N/A	White fumes filter	No
Zinc Chloride Solution	Liquid	7646-85-7	3,700		H400/H410	Flux	No
TG3.65 (Flux) - Zinc Chloride	Liquid	7646-85-7	3,700	2.5	N/A	Pre-treatment	No
H2O2 (30% w/w)	Liquid	7722-84-1	2,820	N/A	N/A	Pre-treatment	No

NaOH	Liquid	1310-73-2	2,720	N/A	N/A	Pre-treatment	No
TIB Inhibitor Premium (Pickling Inhibitor) - 2- Propyn-1-ol,	Liquid	38172-91-7	200	N/A	N/A	Pre-treatment	No
NH4OH (28-30% w/w)	Liquid	7732-18-5/ 1336-21-6	1,780	N//A	H314/H302	Pre-treatment	Yes
Waste Stripping Acid (HCl, FeCl2, ZnCl2)	Liquid	7647-01-0/ 7758-94-3/7646-85-7	N/A	35,000	H290/H302/H314	Waste generated	Yes
Waste (Dross - Zn 90-95% & Fe 6%)	Solid	7440-66-6/7439-89-6	N/A	25	N/A	Waste generated	No
Zinc	Solid	7440-66-6	100,000	350	N/A	Galvanising Process	No
Waste (Skimmings - Zn 30-40% + ZnO + Zn(OH)2	Solid	7440-66-6/1314-13-2/20427-58-1	N/A	25	N/A	Waste generated	Yes
Filter Dust (Solid/ Powder) (Zn 27% - NH4Cl 34%)	Solid	7440-66-6/12125-02-9		10	N/A	White Fumes	Yes

2.4.6 Site security

Paladin fencing will surround the site, there will be an electric gate at the main entrance and pedestrian gates will be provided either side of the main gate. The plant will be unmanned outside of operational hours however monitored cameras will be provided.

2.4.7 Fire safety

All buildings will be designed and constructed as required by the Building Control (Amendment) Regulations, 2014 and appropriate fire certificates will be obtained from Louth County Council. Hibernia Steel (Manufacturing) Limited will provide information pertaining to the processing of materials to the local emergency services. The local fire brigade will be invited on site so as they can develop a comprehensive view of the nature and extent of the facility itself. The purpose of this action is to ensure that the emergency services are familiar with the site, its layout and its processes so as to ensure that they are adequately informed, in the event of an emergency situation. Fire hydrants will be provided within the site and water sourced from potable water supply. Emergency Response Procedures will be in place for the facility in conjunction with the site's Environmental Management System and Safety Statement. All personnel will be suitably trained to respond in accordance with Emergency Response Procedure.

2.4.8 General operational safety

The general operational safety at the proposed development will be planned in accordance with the requirements of Safety, Health & Welfare at Work Act, 2005, Safety, Health & Welfare at Work (General Applications) Regulations, 2007 as Amended, Safety, Health & Welfare at Work (Construction) Regulations, 2013 as Amended through the implementation of a site specific safety system.

The safety statement will outline

- The health & safety policy
- Identify the hazards
- Assess the risks
- How the safety, health and well-being of all employees and visitors is managed
- Training and supervision plan
- Emergency procedures
- Duties of employer and employee
- Responsibilities of those with specific Health & Safety tasks
- Outline of personal protective equipment required and provided

- First aid & fire safety procedures
- Accident and near-miss reporting and investigation
- Communication and participation

2.5 Characteristics of the project – environmental aspects

2.5.1 Environmental aspect / factor assessment

The following assessments are documented in the following chapters:

Chapter 4	Population and Human Health
Chapter 5	Biodiversity
Chapter 6	Cultural Heritage
Chapter 7	Land, Soils and Geology
Chapter 8	Water
Chapter 9	Traffic and Transportation
Chapter 10	Noise
Chapter 11	Air Quality and Climate
Chapter 12	Landscape and Visual Impact
Chapter 13	Material Assets

A summary of Interactions is provided in Chapter 14.

2.5.2 Sensitive receptors

A number of sensitive receptors have been identified within 1km of the site. Refer to Sensitive Receptor Drawing Ref. C216-DR-BCON-CE-201 in Appendix 1 which includes two residences located on the western boundary of the proposed site.

There are a number of SPAs and SACs within 15km of the proposed site. Refer to Figure 2-3 and Table 2-2. The NHAs and pNHAs are provided in Figure 2-4 and Table 2-3.

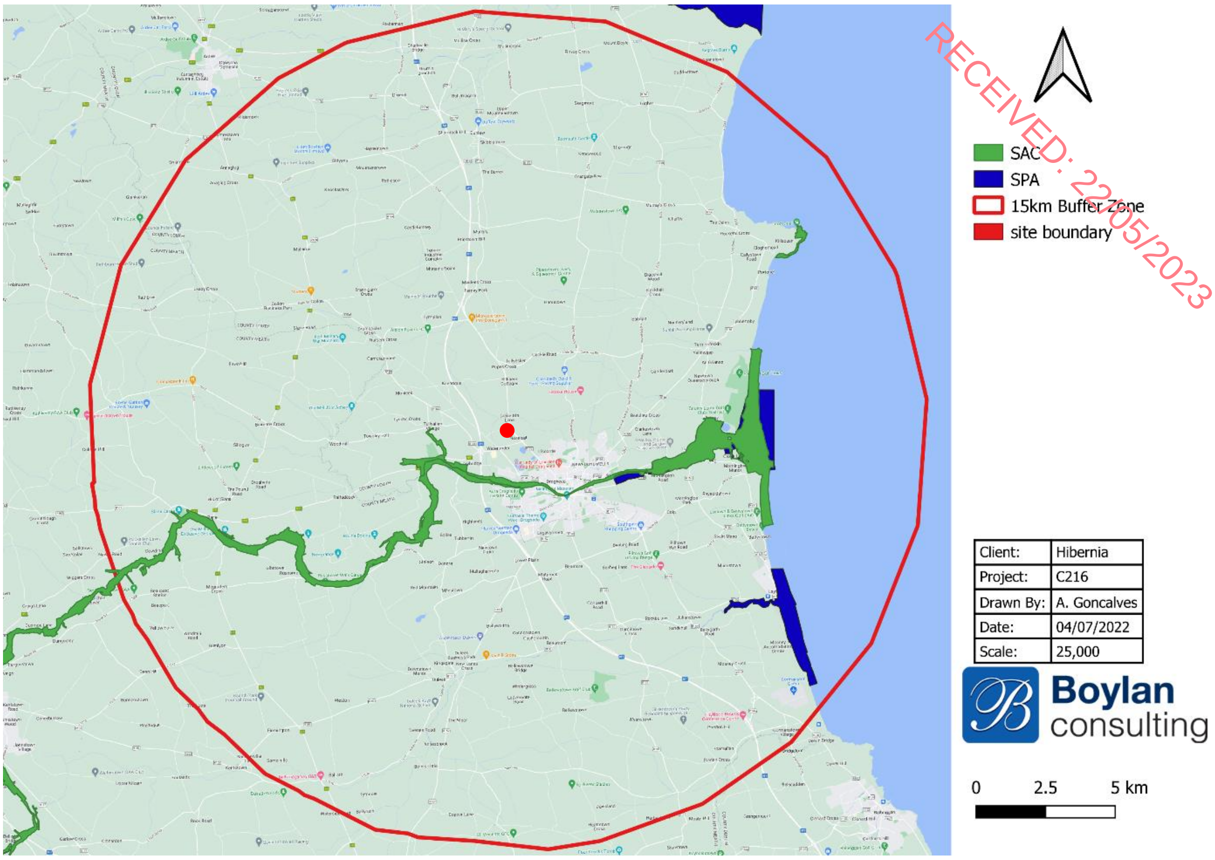

Figure 2-3 SPAs & SACs within 15 km of proposed development (Source: QGIS)

Table 2-2 SPAs and SACs within 15km of proposed development (Source: www.npws.ie/)

Designation	Number	Approximate closest location from the Application Site
River Boyne And River Blackwater (south direction)	SAC (002299)	1.7km south
River Boyne And River Blackwater (south direction)	SPA (004232)	1.7km southwest
Boyne Estuary (east direction)	SPA (004080)	4.2km east
River Nanny Estuary and Shore (southeast direction)	SPA (004158)	10.7km southeast
Clogher Head (Northeast direction)	SAC (001459)	11.5km Northeast

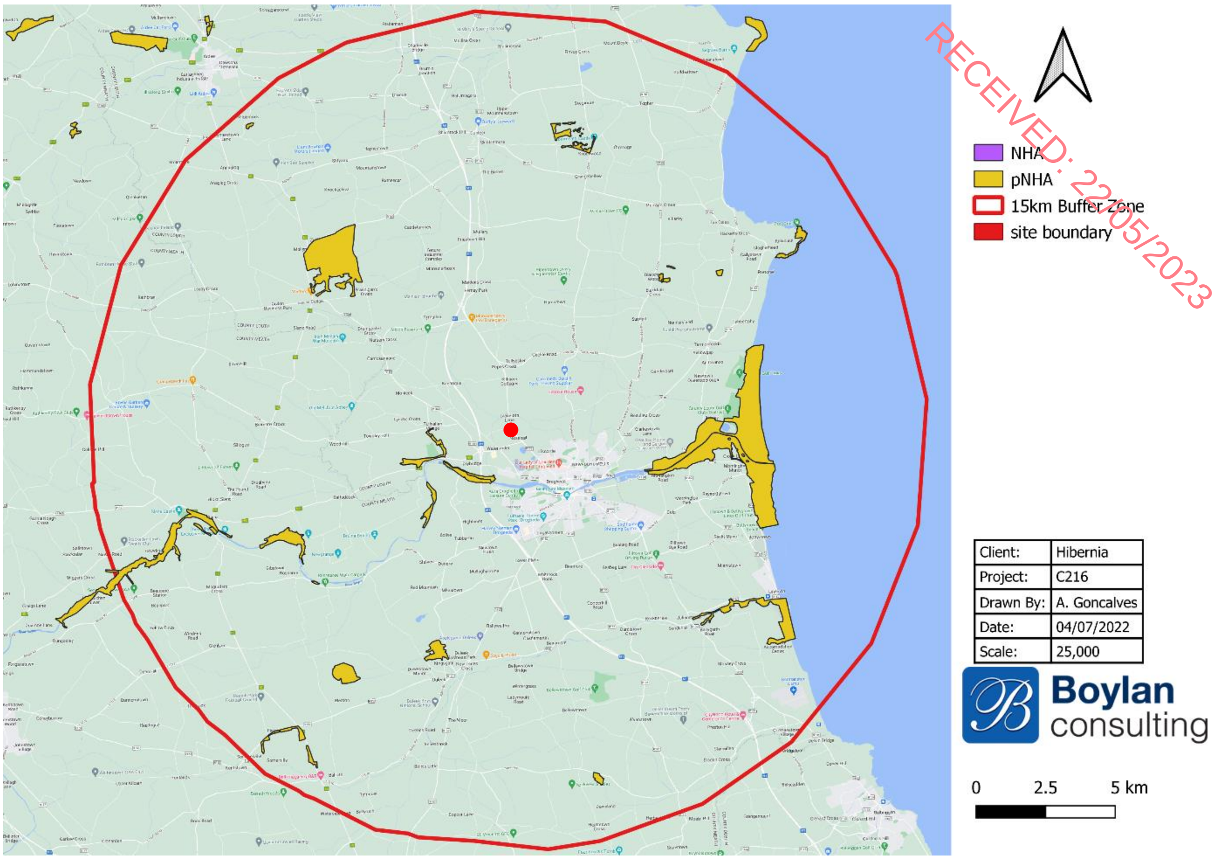

Figure 2-4 NHAs and pNHAs within 15km of the development (Source: QGIS)

Table 2-3 - NHAs and pNHAs within 15km of proposed development (Source: www.npws.ie/)

Designation	Number	Approximate closest location from the Application Site
Boyne Coast and Estuary (east direction)	pNHA (001957)	4.2km East
Mellifont Abbey Woods (North west direction)	pNHA (001464)	7.1km North west
King William's Glen (west direction)	pNHA (001804)	2.7km West
Boyne River Islands (South west direction)	pNHA (001862)	2km South west
Dowth Wetland (South west direction)	pNHA (001861)	3.6km South west
Crewbane Marsh (South west direction)	pNHA (000553)	8.5km South west
Boyne Woods (South west direction)	pNHA (001592)	10.8km South west
Duleek Commons (South direction)	pNHA (001578)	8.1km South
Thomastown Bog (South west direction)	pNHA (001593)	10.4km South west
Balrath Woods (South west direction)	pNHA (001579)	13.1km South west
Cromwell's Bush Fen (South east direction)	pNHA (001576)	12.9km South east
Laytown Dunes/Nanny Estuary (South east direction)	pNHA (000554)	9.5km South east
Blackhall Woods (North east direction)	pNHA (001293)	7.6km North east
Castlecoo Hill (North east direction)	pNHA (001458)	9.3km North east
Clogher Head (North east direction)	pNHA (001459)	11.3km North east
Barmeath Woods (North east direction)	pNHA (001801)	10km North east

2.5.3 Emissions

Air

There are 5 No. point source emissions to air

Table 2-4 Point source emissions to air

Number	Source	Height (m) (above finished floor level)	Stack*diameter (m)
E1	Cooling tower	7.5 m	1m
E2	Flue gas (main)	20 m	0.6 m
E3	Flue gas (stand-by)	20 m	0.6 m
E4	Acid vapour scrubber (acid vapours from pre-treatment area)	20 m	1.5 m
E5	White fumes/dust (from zinc kettle)	20 m	1.6 m

*There is no stack associated with the cooling tower, there is a discharge point for water vapour emissions on the western side of the main building (approx. 7.5m above finished floor level). All other air emission points are located on the roof of the main building at 20m above finished floor level.

The locations of the discharge points are depicted on the Emission Points drawing in Appendix 1 (Ref.: C216-DR-BCON-CE-202). Further details in relation to air emissions are provided in Chapter 11 Air Quality and Climate.

Water

Domestic wastewater will be discharged to local sewer. Refer to Section 2.3.5 above.

Storm water from yard areas will pass through a full retention oil interceptor prior to discharge. Water generated in the northern portion of the site will infiltrate to ground. Storm water generated in the southern portion of the site will be attenuated and released to the open drain at the south of the site. Refer to Section 2.3.6 and Chapter 13 Material Assets for further details on storm water management.

2.5.4 Waste generation

Construction phase

Waste generated during the construction phase will be managed in accordance with a detailed Construction Waste Management Plan. Waste volumes and type generated during construction are expected to be similar to other typical construction projects. There are no demolition works associated with this project.

It is expected that there will be no export of soils off-site. Soils not suitable for use as fill within the site will be used to construct non-structural landscaping berms.

Operational phase

Wastes likely to arise during the operational phase include chemicals from pre-treatment operations, white dust from galvanising process, general office and canteen waste and packaging materials from raw materials. Periodically waste materials will arise due to equipment maintenance.

Waste chemicals will be stored in the services area in designated containers prior to collection by an authorised contractor for disposal or recovery. White dusts are contained within the filter bags until collected by an authorised waste collector for disposal. Source segregated skips will be provided for packaging materials and other dry recyclables. Where materials cannot be source segregated, general skip receptacles will be provided. All wastes arising on site will be collected by authorised collectors only and recovered at authorised facilities only. Wastewater from the oil interceptor will be collected on scheduled basis by an authorised contractor.

2.5.5 Nuisance control

The processing building will be appropriately cladded to minimise noise impacts on neighbouring properties.

Good management practices implemented onsite will ensure that the proposed development does not give rise to nuisance type impacts.

2.5.6 Use of natural resources

Water will be supplied from the public main and from rainwater harvesting. Approximately 1,500 m3 water will be consumed by the process annually. Rainwater harvesting will be used to augment the mains supply.

Liquid Petroleum Gas (LPG) gas will be the main source of energy for heating on site. Two LPG tanks will be provided on-site.

Electricity will be sourced from a connection to the local grid. Electricity may ultimately be generated from fossil fuels or renewables (e.g. wind, solar).

The site of the proposed development is 3.419Ha which will be transformed from existing unused and overgrown land to a developed site.

Chemicals as outlined in Table 2-1 will be used during the process.

2.5.7 Unplanned Events

Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (May, 2022) indicates that EIARs should address unplanned effects as relevant (examples include accidents, spills, floods and fires). Directive 2014/52/EU further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned. The Directive gives examples of 'flooding, sea level rise, or earthquakes'.

An Emergency Response Procedure for the site will be prepared prior to start-up of the operational phase. Adequate spill kits will be provided on site to clean -up spills from traffic accidents or leaks from mobile equipment.

The storage of chemicals on-site are below the lower tier thresholds outlined in Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances Regulations 2015 (S.I. No. 209 of 2015 or COMAH Regulations) as transposed from EU Directive 2012/18/EC known as Seveso III Directive. A list of chemicals proposed to be stored on site was notified to the Health & Safety Authority (HSA) and it was confirmed by them that based on the inventory below that the facility is not a Tier 1 or Tier 2 COMAH site. However, it meets the criteria of a process industries site and would be subject to inspection by the Chemical, COMAH, Production and Storage unit of the HSA. (Refer to Appendix 5A for copy of notification form and Appendix 5B for correspondence from HSA). All chemicals will be stored in suitable containers and bunded as required.

The site is considered low risk in terms of flooding, sea level rise and earthquakes.

All buildings will be designed and constructed as required by the Building Control (Amendment) Regulations, 2014 and appropriate fire certificates will be obtained from Louth County Council. In the unlikely event of a fire the storm water attenuation tank and lower yard will be used to retain fire water. The valves in the attenuation tank will be shut-off to prevent migration of contaminated fire water to surface water. Hydrants will be provided within the site.

Unplanned events are considered in the individual environmental assessment chapters.

2.5.8 Remediation & aftercare

An Environmental Liability Risk Assessment (ELRA) and Closure Remediation and Aftercare Plan (CRAMP) will be prepared in accordance with the *Guidance on Assessing and Costing Environmental Liabilities* (EPA, 2014).

2.6 Bibliography

EPA. May 2022. *Guidelines on the information to be contained in Environmental Impact Assessment Reports.*

EPA. 2014. *Guidance on Assessing and Costing Environmental Liabilities.*

Louth County Council. November 2021. *Louth County Development Plan 2021-2027*.

3 ALTERNATIVES

3.1 Introduction

This chapter of the EIAR was prepared on behalf of Boylan Consulting by Steven Peck, BA (Hons), MA, MRTPI, and approved by Cathal Boylan, BEng. (Hons) Engineering, Director at Boylan Consulting. Steven Peck is a Chartered Town Planner with significant experience in EIA projects including large infrastructure and urban development projects. As Director at Boylan Consulting Cathal Boylan has overseen numerous EIA projects, and prior to setting up Boylan Consulting Cathal Boylan worked as a Project Manager with ESB International, on numerous applications for large scale infrastructural projects many of which were supported by the EIA process. Cathal is a Chartered Engineer and is a member of Engineers Ireland.

Directive 2014/52/EU requires an EIAR to contain 'A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.'

The presentation and consideration of the various reasonable alternatives investigated by the developer is an important requirement of the EIA process.

This chapter of the EIAR has been prepared with reference to relevant guidance within:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency, May 2022.
- Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessment, Department of Housing, Planning and Local Government, August 2018.
- Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report, European Commission, November 2017.

It is noted that the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports state at Section 3.4.1 that 'The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with 'an indication of the main reasons for selecting the chosen option'. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required'[2].

3.2 Rationale for proposed development

The proposed development is anticipated to lead to the creation of approximately 110 jobs. In this regard the proposed development will support national and regional strategic planning outcomes for a strong economy, supported by enterprise, innovation and skills. Indigenous employment generating investment is supported by the Louth County Development Plan 2021-2027 ('the Development Plan') and Louth Local Economic and Community Plan 2016-2022.

It is considered that the proposed development accords with strategic spatial strategies for growth at national, regional and local levels. In this regard it is highlighted that:

- At national level, it is considered that the proposed development supports the development of the Drogheda Regional Centre in accordance with National Planning Framework policy objectives 2b and 7.
- At regional level, it is considered that the proposed development accords with Eastern and Midland Region Regional Spatial and Economic Strategy Regional Policy Objective 4.14 for the Drogheda Regional Growth Centre in respect of promoting self-sustaining economic and employment-based development opportunities to match and catch-up on rapid phases of housing delivery in recent years to provide for employment growth and reverse commuting patterns, and Regional Policy Objective 4.18 for the Drogheda Regional Growth Centre in respect of developing new industry on suitable sites to enhance Drogheda's role as a strategic employment centre on the Dublin-Belfast Economic Corridor and provide for employment opportunities.
- At local level, the proposed development is considered as located within the Northern Environs of Drogheda as referenced in the Development Plan[3]. The Development Plan states that the development of the employment and residential lands in the Northern Environs are a fundamental element of the immediate and long-term growth strategy for the town (Development Plan Section 2.13.12). The Development Plan states that the land bank will act as a counter balance to the level of growth that has taken place in the Southern Environs of the town (Development Plan Section 2.13.6). The Northern Environs is considered to contain two areas of undeveloped lands zoned for employment uses, located within the west and east of the Northern Environs area, respectively. In view of this, it is considered that it follows that

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[2] Ref CJEU Case 461/17

[3] See Footnote 1

employment development on the undeveloped lands zoned for employment uses within the west of the Northern Environs – including the application site – is a fundamental element of the immediate growth strategy for Drogheda, particularly as it is considered that the Development Plan indicates (Development Plan Section 5.12.4) there is at present no funding available for completion of the Port Access Northern Cross Route (a road project) as far as the undeveloped lands zoned for employment uses in the east of the Northern Environs, or the water services infrastructure to provide for the release of these lands.

- The application site is provided by IDA Ireland and comprises part of lands at this location to be developed as an IDA Ireland business park (see Section 2.2).
- Pre-planning consultation was undertaken with Louth County Council (see Section 1.7) in respect of zoning policy and Louth County Council advised that the principle of the proposal at this location is acceptable.
- It is also highlighted that the application site context includes (see also Section 2.2) uncompleted access roads and other infrastructure installed on foot of planning permission Reg. Ref.: 071435 / An Bord Pleanála Ref.: PL15.228184 which were intended to serve lands in this area including the application site, representing significant prior investment in this area, and it is considered that the proposed development represents an opportunity to utilise some of this infrastructure, and it is considered that these are positive considerations in respect of the location of the proposed development.

The proposed development has been brought forward in accordance with an EIA process aiming to ensure a high level of protection of the environment and public health.

3.3 Consideration of alternatives

3.3.1 Alternative locations

Lands Adjoining East of Hibernia Steel Premises, Grangegeeth, Co. Meath (Approximate centre point X: 695073 Y:778854).

Consideration was given by the Applicant to locating the development on lands adjoining the east of the Hibernia Steel Premises in Grangegeeth, Co. Meath. No agreement to acquire the lands could be reached with the land owner (the land owner was not interested in selling the lands).

In respect of planning and environmental considerations it was also noted that any proposed development on these lands at Grangegeeth would rely on ‘local’ classification rural roads for vehicular access, would not benefit from any specific zoning policy facilitating industrial development, and would not benefit from any known nearby connections to the Irish Water foul drainage network.

Lands Adjoining West of Hibernia Steel Premises, Grangegeeth, Co. Meath (Approximate centre point X: 694878 Y:778690)

Consideration was given by the Applicant to locating the development on lands adjoining the west of the Hibernia Steel Premises in Grangegeeth, Co. Meath. No agreement to acquire the lands could be reached with the land owner.

In respect of planning and environmental considerations it was also noted that any proposed development on these lands at Grangegeeth would rely on 'local' classification rural roads for vehicular access, would not benefit from any specific zoning policy facilitating industrial development, and would not benefit from any known nearby connections to the Irish Water foul drainage network.

Lands at Drogheda Business and Technology Park, Co. Meath (Approximate centre point X: 706965 Y:774204)

The Applicant made contact with IDA Ireland seeking possible siting options. Two options were provided by IDA Ireland, lands at Drogheda Business and Technology Park, Co. Meath, and the application site. Consideration was given by the Applicant to locating the development on the lands at Drogheda Business and Technology Park. The E1 Strategic Employment Zones (High Technology Uses) zoning policy at this location was considered less supportive of the proposed development than the E1 General Employment zoning policy at the application site.

3.3.2 Alternative processes

Galvanising is the process of applying a protective zinc coating to steel or iron, to prevent rusting. The proposed (and most common) method is hot-dip galvanising, in which the parts are submerged in a bath of hot molten zinc. This can be done on a batch or continuous basis. Hibernia Steel propose to use a batch system. This is the most common galvanising method. The design of the proposed galvanising process and all associated specialised plant, machinery and works will be provided by a specialist supplier and is similar to other modern examples of such facilities.

Other methods of galvanising in industrial applications, include thermally sprayed zinc coatings, electroplated zinc coatings, and sherardized steel components.

The proposed method is in line with the products, services and the market in which the applicant is operating.

From an environmental perspective, the proposed galvanising process is considered to be the best option. The process allows the recovery and recycling of zinc, thus reducing waste and minimizing the impact on the environment. The process has a low energy consumption, and is also more efficient in terms of zinc usage, the zinc used in the process being recovered and reused.

The applicant considered several suppliers for the galvanising plant all of which were assessed in terms of cost, reliability, level of automation, environmental factors, technical support, health and safety considerations and installation considerations. From an environmental perspective the plant that was chosen had the following advantages over other suppliers:

(i) Highly automated, reducing the requirement for higher numbers of forklift trucks on site.

(ii) Energy efficient Gas-powered heating system – LPG was deemed more sustainable than electrical options.

(iii) Option for Hibernia to supply and manufacture steel for internal structures, reducing haulage of finished steel products.

(iv) Professional team & good technical support.

3.3.3 Alternative layouts

An alternative broad layout was considered at an early stage in the design process as indicated in Figure 3-1. This broad layout included the in-take / out-take area of the main building located to the north, and the processing and services area located to the south.

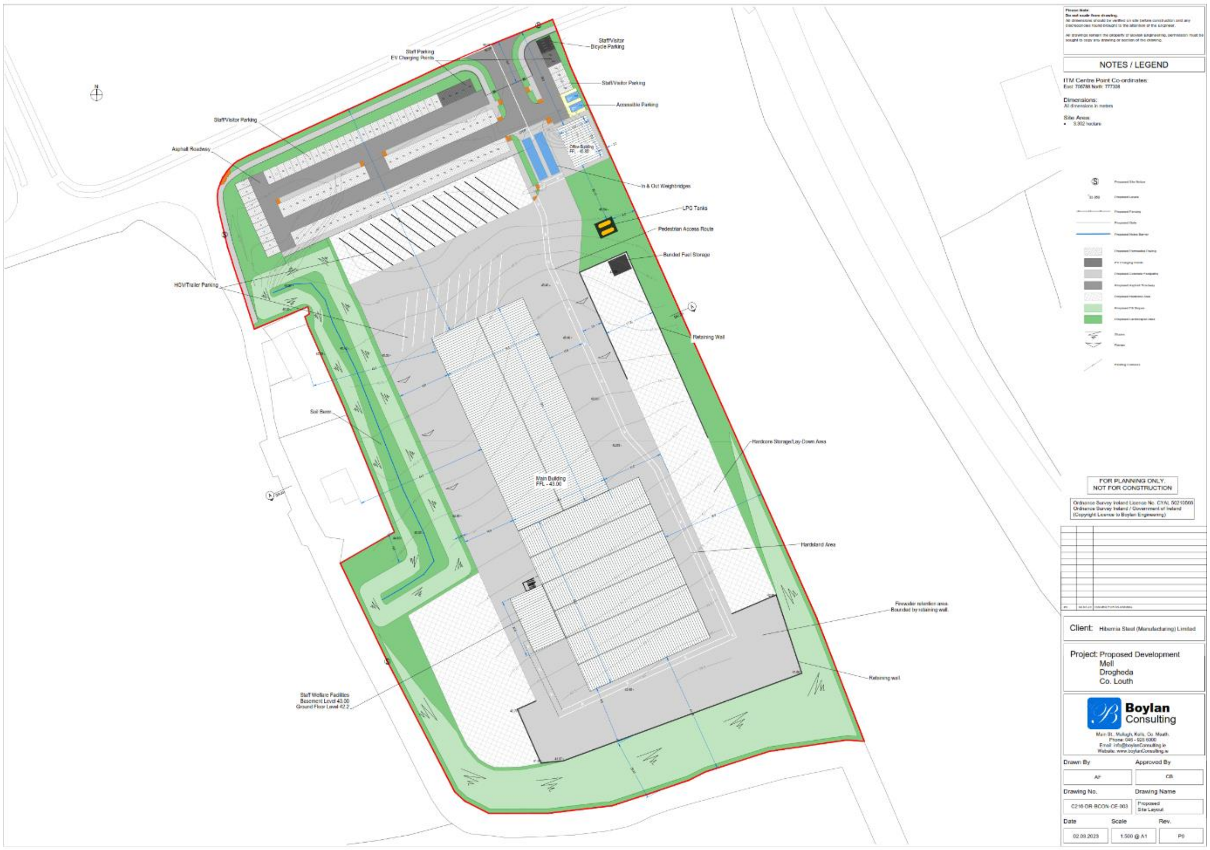

Figure 3-1 Indication of alternative broad layout considered at an early stage in the design process. This broad layout included the in-take / out-take area of the main building located to the north, and the processing and services area located to the south.

This broad layout option was discounted in favour of the selected option. In respect of environmental considerations, the reasons for discounting this option included that siting the in-take / out-take area to the south as proposed increases distances from the two residential properties on the western site boundary and this was identified as likely reducing noise effects on these receptors.

3.3.4 Alternative designs

The overall size / scale of the project reflects key project parameters and technical and operational factors. The differing heights of the two main sections of the main building are for operational reasons and to accommodate required equipment.

3.3.5 'Do-nothing' alternative

In a 'do-nothing' alternative, the proposed project would not proceed. In this event, the effects of the project on the environmental factors considered in this EIAR would not arise, including positive effects arising e.g. in relation to the anticipated generation of employment and economic activity. Ecology on the site would continue to evolve.

The Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports state at Section 3.4.2 that assessment in respect of 'do-nothing' alternatives should include cumulatively considering the effects of projects which already have consent but are not yet implemented. No projects which already have consent but are not yet implemented have been identified that it is considered individually or cumulatively would significantly affect the evolution of the environmental factors of the site and environs.

3.4 Bibliography

Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency, May 2022.

Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessment, Department of Housing, Planning and Local Government, August 2018.

Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report, European Commission, November 2017.

National Planning Framework, Department of Housing, Planning and Local Government, February 2018.

Eastern and Midland Regional Spatial and Economic Strategy, Eastern and Midland Regional Assembly, June 2019.

Louth County Development Plan 2021-2027, Louth County Council, November 2021.

Louth Local Economic and Community Plan 2016-2022, Louth County Council, March 2016.

4 POPULATION & HUMAN HEALTH

4.1 Introduction

This chapter of the EIAR was prepared on behalf of Boylan Consulting by Steven Peck, BA (Hons), MA, MRTPI, and approved by Cathal Boylan, BEng. (Hons) Engineering, Director at Boylan Consulting. Steven Peck is a Chartered Town Planner with significant experience in EIA projects including large infrastructure and urban development projects. As Director at Boylan Consulting Cathal Boylan has overseen numerous EIA projects, and prior to setting up Boylan Consulting Cathal Boylan worked as a Project Manager with ESB International, on numerous applications for large scale infrastructural projects many of which were supported by the EIA process. Cathal is a Chartered Engineer and is a member of Engineers Ireland.

4.2 Methodology

This chapter of the EIAR has been prepared with reference to relevant guidance within:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency, May 2022.
- Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessment, Department of Housing, Planning and Local Government, August 2018.
- Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report, European Commission, November 2017.

The European Commission Guidance on the Preparation of the Environmental Impact Assessment Report includes at Footnote 2 that 'The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive [...]'. The Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports include at Section 3.3.6 that 'in an EIAR, the assessment of impacts on population & human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under the environmental factors of air, water, soil etc.'.

This chapter contains an assessment of the likely significant land-use and socio-economic effects of development. Information in respect of the existing receiving environment was obtained from the Central Statistics Office, Economic and Social Research Institute, National Planning Framework, Eastern and Midland Region Regional Spatial and Economic Strategy, Louth County Development Plan 2021-2027 ('the Development Plan') and the Louth County Council planning applications website. In accordance with the above-mentioned guidance at Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, the assessment of impacts on population and human health in this chapter refers to the assessments of those environmental factors under which human health effects might occur, as addressed elsewhere in this EIAR. These factors are identified as water quality, traffic (road safety), noise and air quality, respectively, and the reader is directed to the relevant EIAR Chapters 8 Water, 9 Traffic & Transportation, 10 Noise and 11 Air Quality and Climate, respectively, for relevant background information where appropriate. Assessment is also provided as to any significant effects on population and human health derived from the vulnerability of the proposed development to risks of major accidents and / or disasters, as required by EIA legislation (see Section 1.3).

No difficulties were encountered in compiling this chapter of this EIAR.

4.3 Characteristics of the development

The description of the proposed development is provided within Chapter 2. In summary, the proposal is for a hot dip galvanising facility at Mell, Drogheda, County Louth.

4.4 Receiving environment

The existing environment is considered in this section under the following headings:

- Employment and Economic Activity
- Population
- Land Use and Settlement Patterns

Each environmental factor as assessed within the relevant chapter of this EIAR includes a relevant receiving environment description and these are not duplicated in this section.

4.4.1 Employment and Economic Activity

The CSO's Labour Force Survey for Quarter 3 2022, published in November 2022, identifies that unemployment decreased nationally by 30,000 (-20.0%) in the year to Quarter 3 2022 bringing the total number of persons unemployed to 119,100.

There was an annual increase in employment of an estimated 3.4% or 83,000 in the year to Quarter 3 2022, bringing total employment to an estimated 2,554,300. The long-term unemployment rate decreased from 1.7% to 1.1% over the year to Quarter 3 2022. Long-term unemployment accounted for 27.2% of total unemployment in Quarter 3 2022 compared with 32.3% a year earlier.

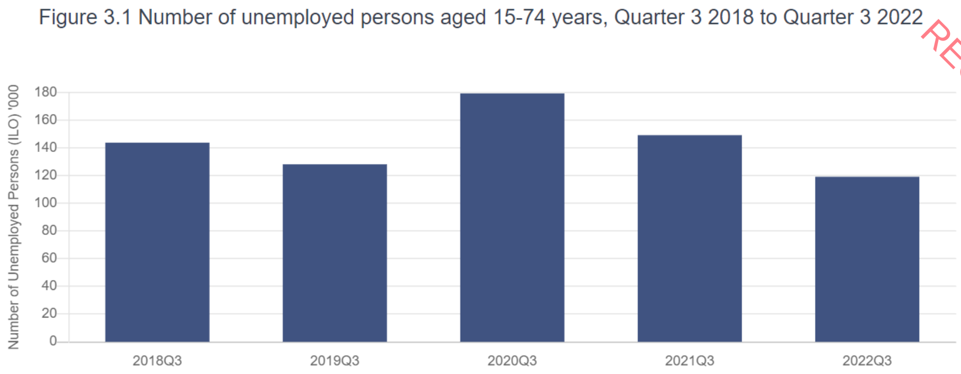

Figure 4-1 Reproduction of Figure 3.1 within CSO's Labour Force Survey for Quarter 3 2022, indicating number of unemployed persons aged 15-74 years, Quarter 3 2018 to Quarter 3 2022.

In its Quarterly Economic Commentary published in October 2022, the ESRI forecast that 2023 will see a further fall in unemployment:

'Given the rapid recovery of the labour market in the first half of 2022, we expect the unemployment rate to continue to improve gradually. We now anticipate an unemployment rate of 4.8 per cent and 4.1 per cent in 2022 and 2023, respectively.' (ESRI Quarterly Economic Commentary, October 2022, p. 49)

The ESRI forecasts the economy to grow at a reduced pace in 2023 with forecast gross domestic product (GDP) growth of 4.1 per cent, and forecast modified domestic demand (MDD) growth of 2.5 per cent, respectively, in 2023. (ESRI Quarterly Economic Commentary, October 2022, pp. 1 and 14)

Population

The application site is located within the electoral division (ED) of St. Peter's, within the administrative area of Louth County Council. Table 4-1 sets out relevant preliminary census 2022 data from the CSO.

Table 4-1 Population change at the State, County Louth and St. Peter's ED levels, 2016-2022 (preliminary CSO census 2022 data).

Unit	Population		
	2016	2022	% change
State	4,761,865	5,123,536	7.6
Louth	128,884	139,100	7.9
St. Peter's ED	9,721	10,858	11.7

The CSO preliminary census 2022 data includes that the population of the State increased between 2016 and 2022 by 7.6%, bringing its total population to 5,123,536. Growth within County Louth and the St. Peter's ED was higher than the national average, with growth rates of 7.9% and 11.7%, respectively.

4.4.2 Land Use and Settlement Patterns

The application site comprises lands located west of the R132 road north-west of Drogheda, County Louth. The site comprises unused land. Surrounding land uses comprise predominantly agricultural / unused lands. There are two residential properties adjacent to the western boundary.

The application site context includes (see also Section 2.2) uncompleted access roads and other infrastructure installed on foot of planning permission Reg. Ref.: 071435 / An Bord Pleanála Ref.: PL15.228184 which were intended to serve lands in this area including the application site.

The application site is provided by IDA Ireland and comprises part of lands at this location to be developed as an IDA Ireland business park (see Section 2.2).

In respect of broad settlement and land use patterns, key planning policies of relevance to the proposed development are considered to include:

- Drogheda is designated as a Regional Centre within the National Planning Framework (NPF), the growth of which, in accordance with the Regional Spatial and Economic Strategy, is supported by NPF policy objectives 2b and 7.
- Drogheda is designated as a Regional Growth Centre within the Eastern and Midland Region Regional Spatial and Economic Strategy (EMRA RSES). The RSES states at Section 6.4 (RSES p.132) that the role of Regional Growth Centres within the RSES is to serve as a focal point to gain critical mass and deliver positive impacts to their surrounding areas and enhance overall regional and national growth. The RSES states at Section 4.5 (RSES p.53) that the EMRA RSES Regional Growth Centres are critical to the implementation of effective regional development as set out in the NPF. Regional Policy Objectives for the Drogheda Regional Growth Centre include Regional Policy Objective 4.14 to 'promote self-sustaining economic and employment-based development opportunities to match and catch-up on rapid phases of housing delivery in recent years to provide for employment growth and reverse commuting patterns', and Regional Policy Objective Regional Policy Objective 4.18 to 'enhance Drogheda's role as a strategic employment centre on the Dublin-Belfast Economic Corridor and provide for employment opportunities through identification of suitable sites for new industry including FDI'.
- Relevant Louth County Development Plan 2021-2027 ('the Development Plan') policies in respect of the Drogheda Regional Growth Centre include Policy CS 11 which includes supporting the Drogheda Regional Growth Centre as a regional economic driver targeted to grow to city scale with a population of 50,000 by 2031 and capitalising on its strategic location on the Dublin-Belfast Economic Corridor, Policy EE 28 which is to prioritise economic development in Drogheda and Dundalk taking account of the strategic importance of the

settlements along the Dublin-Belfast Economic Corridor and their designation as Regional Growth Centres in the RSES, and Policy EE 33 which is to promote the Drogheda Regional Growth Centre as a primary centre for employment in the County that maximises the locational advantage of the town along the Dublin-Belfast Economic Corridor.

- The proposed development is considered as located within the Northern Environs of Drogheda as referenced in the Development Plan[4]. The Development Plan states at Section 2.13.6 in respect of the Northern Environs that this land bank will '[...] ensure the town has the capacity to deliver the population and economic growth envisaged in the NPF and RSES and will act as a counter balance to the level of growth that has taken place in the Southern Environs of the town'. The Development Plan states at Section 2.13.2 that the development of the employment and residential lands in the Northern Environs are a fundamental element of the immediate and long-term growth strategy for the town. The Northern Environs is considered to contain two areas of undeveloped lands zoned for employment uses, located within the west – including the application site – and east of the Northern Environs area, respectively. It is considered that the Development Plan indicates at Section 5.12.4 that there is at present no funding available for completion of the Port Access Northern Cross Route (a road project) as far as the undeveloped lands zoned for employment uses in the east of the Northern Environs, or the water services infrastructure to provide for the release of these lands.
- Under the Development Plan the site is zoned 'E1 General Employment' with objective 'To provide for general enterprise and employment generating activities'.

4.5 Impacts of the development

4.5.1 Construction stage

Direct impacts

Employment and Economic Activity

The construction of the proposed development is likely to have positive effects on employment and economic activity within the construction sector, including contributing to the viability of the enterprises engaged in construction during the period.

Land-Use and Settlement Patterns

As set out in Section 4.5.2 it is considered that the operational phase of the proposed development will deliver benefits in respect of broad settlement and land use patterns including supporting the

[4] See footnote 1.

development of the Drogheda Regional Centre in accordance with National Planning Framework policy objectives 2b and 7, enhancing Drogheda's role as a strategic employment centre on the Dublin-Belfast Economic Corridor, contributing economic / employment development towards matching and catching-up on rapid phases of housing delivery in Drogheda in recent years, assisting in counter balancing the level of growth that has taken place in the Southern Environs of the town, and making use of previous investment in infrastructure.

As such, the site is considered suitable in respect of broad settlement and land use patterns for construction activities required to provide the proposed development.

Water Quality

Chapter 8 Water Table 8-9 sets out that construction stage predicted effects on the water environment without mitigation will be slight (not significant) in significance.

Table 8-10 of Chapter 8 sets out mitigation measures which further reduce the significances of these effects to imperceptible.

Traffic (road safety)

In respect of road safety, Chapter 9 Traffic & Transportation Section 9.5.1 sets out an assessment of sightlines at the access road linking Chapel Lane to the R132 access on the R132, which will be used by construction and operational traffic. This concludes that the required visibility is met.

Noise

Chapter 10 Noise Table 10-12 sets out that construction stage predicted effects on the noise environment will be moderate (not significant) in significance. Mitigation measures are set out in Section 10.6.

Air Quality

Chapter 11 Air Quality and Climate Table 11-13 sets out that construction stage predicted effects on the air quality and climate environment will be imperceptible in significance. Mitigation measures are set out in Table 11-14.

<u>Indirect impacts</u>

Employment and Economic Activity

The construction of the proposed development is likely to have positive indirect effects on employment and economic activity in services supporting the construction operations e.g. retail and professional services, including contribution to the viability of such retail and professional services during the period.

4.5.2 Operational stage

Direct impacts

Employment and Economic Activity

The proposed development is anticipated to lead to the creation of approximately 110 jobs. It is considered that this will have likely positive effects on employment and economic activity.

Land-Use and Settlement Patterns

In respect of broad settlement and land use patterns, it is considered that the proposed development accords with strategic spatial strategies for growth at national, regional and local levels. In this regard it is highlighted that:

- At national level, it is considered that the proposed development supports the development of the Drogheda Regional Centre in accordance with National Planning Framework policy objectives 2b and 7.
- At regional level, it is considered that the proposed development accords with Eastern and Midland Region Regional Spatial and Economic Strategy Regional Policy Objective 4.14 for the Drogheda Regional Growth Centre in respect of promoting self-sustaining economic and employment-based development opportunities to match and catch-up on rapid phases of housing delivery in recent years to provide for employment growth and reverse commuting patterns, and Regional Policy Objective 4.18 for the Drogheda Regional Growth Centre in respect of developing new industry on suitable sites to enhance Drogheda's role as a strategic employment centre on the Dublin-Belfast Economic Corridor and provide for employment opportunities.
- At local level, the proposed development is considered as located within the Northern Environs of Drogheda as referenced in the Development Plan[5]. The Development Plan states that the development of the employment and residential lands in the Northern Environs are a fundamental element of the immediate and long-term growth strategy for the town (Development Plan Section 2.13.2). The Development Plan states that the land bank will act as a counter balance to the level of growth that has taken place in the Southern Environs of the town (Development Plan Section 2.13.6). The Northern Environs is considered to contain two areas of undeveloped lands zoned for employment uses, located within the west and east

[5] See footnote 1.

of the Northern Environs area, respectively. In view of this, it is considered that it follows that employment development on the undeveloped lands zoned for employment uses within the west of the Northern Environs – including the application site – is a fundamental element of the immediate growth strategy for Drogheda, particularly as it is considered that the Development Plan indicates (Development Plan Section 5.12.4) there is at present no funding available for completion of the Port Access Northern Cross Route (a road project) as far as the undeveloped lands zoned for employment uses in the east of the Northern Environs, or the water services infrastructure to provide for the release of these lands.

- The application site is provided by IDA Ireland and comprises part of lands at this location to be developed as an IDA Ireland business park (see Section 2.2).
- Pre-planning consultation was undertaken with Louth County Council (see Section 1.7) in respect of zoning policy and Louth County Council advised that the principle of the proposal at this location is acceptable.
- It is also highlighted that the application site context includes (see also Section 2.2) uncompleted access roads and other infrastructure installed on foot of planning permission Reg. Ref.: 071435 / An Bord Pleanála Ref.: PL15.228184 which were intended to serve lands in this area including the application site, representing significant prior investment in this area, and it is considered that the proposed development represents an opportunity to utilise some of this infrastructure, and it is considered that these are positive considerations in respect of the location of the proposed development.

In view of the foregoing it considered that the proposed development will deliver benefits in respect of broad settlement and land use patterns including supporting the development of the Drogheda Regional Centre in accordance with National Planning Framework policy objectives 2b and 7, enhancing Drogheda's role as a strategic employment centre on the Dublin-Belfast Economic Corridor, contributing economic / employment development towards matching and catching-up on rapid phases of housing delivery in Drogheda in recent years, assisting in counter balancing the level of growth that has taken place in the Southern Environs of the town, and making use of previous investment in infrastructure.

Water Quality

Chapter 8 Water Table 8-9 sets out that operational stage predicted effects on the water environment without mitigation will range from range from slight (not significant) to moderate (not significant) in significance.

Table 8-10 of Chapter 8 sets out mitigation measures which further reduce the significances of these effects to imperceptible.

Traffic (road safety)

In respect of road safety, Chapter 9 Traffic & Transportation Section 9.5.2 sets out an assessment of sightlines at the access road linking Chapel Lane to the R132 access on the R132, which will be used by construction and operational traffic. This concludes that the required visibility is met.

Noise

Chapter 10 Noise Table 10-12 sets out that operational stage predicted effects on the noise environment will be moderate (not significant) in significance. Mitigation measures are set out in Section 10.6.

Air Quality

Chapter 11 Air Quality and Climate Table 11-13 sets out that operational stage predicted effects on the air quality and climate environment will range from imperceptible to low in significance. Mitigation measures are set out in Table 11-14.

<u>Indirect impacts</u>

Employment and Economic Activity

It is considered that the proposed development and associated employment will have likely positive indirect effects on employment and economic activity, e.g. employment in / requirement for suppliers of materials / services supporting the proposed galvanising facility, and employment in / requirement for suppliers of goods / services to the anticipated 110 employees, including contributing to the viability of such enterprises.

Population

It is considered that the employment creation associated with the proposed development will likely support population growth in the area.

4.5.3 Unplanned events

<u>Direct impacts</u>

Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports indicates that EIARs should address unplanned effects as relevant (examples include accidents, spills, floods and fires). Directive 2014/52/EU further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned. The Directive gives examples of 'flooding, sea level rise, or earthquakes'.

Section 2.5.7 sets out that the proposed development will not comprise a Tier 1 or Tier 2 COMAH site. No features or land uses in the vicinity of the site have been identified as likely resulting in risks of an accident and / or disaster.

Section 2.5.7 sets out that the site is considered low risk in terms of flooding, sea level rise and earthquakes. An Emergency Response Procedure for the site will be prepared prior to start-up of the operational phase.

Section 2.5.7 sets out that all buildings will be designed and constructed as required by the Building Control Regulations, and appropriate fire certificates will be obtained from Louth County Council. In the unlikely event of a fire the storm water attenuation tank and lower yard will be used to retain fire water. The valves in the attenuation tank will be shut-off to prevent migration of contaminated fire water to surface water. Hydrants will be available within the development.

Unplanned events including major accidents and / or disasters assessed as potentially affecting water quality are set out within Chapter 8 Water Table 8-9. Table 8-10 of Chapter 8 sets out relevant mitigation measures and sets out that the predicted effects arising from these unplanned events will be imperceptible in significance.

Chapter 11 Air Quality and Climate states at Section 11.5.4 that with regards to unplanned events (accidental / major disasters) such as a fire, the risk would be considered low, and the impacts to air quality would be considered negligible.

In view of the foregoing no likely significant effects on population and human health are anticipated to arise as a result of unplanned events including major accidents and / or disasters.

Indirect impacts

No significant indirect effects on population and human health are identified as likely to arise as a result of unplanned events including major accidents and / or disasters.

4.5.4 Cumulative impacts

Effects arising in respect of existing developments are considered within the assessment of the receiving environment, and in respect of water quality, traffic, noise and air quality, within the receiving environment sections of EIAR chapters 8, 9, 10 and 11 respectively, and as such are considered cumulatively with the effects of the proposed development as set out in this Chapter.

In accordance with EIA legislation and Table 3.5 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (see Section 1.9 of Chapter 1), searches were undertaken for approved developments, but not yet built or operational, of relevance to the consideration of cumulative effects in respect of population and human health and none were identified. This includes as set out in Sections 8.5.2, 9.5.4, 10.5.6 and 11.5.5, respectively, searches undertaken for approved developments, but not yet built or operational, of relevance to the consideration of cumulative effects in respect of water quality, traffic, noise and air quality, respectively.

4.5.5 'Do-nothing' impacts

In the event that the proposed development did not proceed, the effects of the development on population and human health considered in this chapter would not arise, including positive effects arising in relation to the anticipated generation of employment and economic activity, and in relation to broad settlement and land use patterns.

4.6 Mitigation measures

Water *Quality*

Chapter 8 Water Table 8-10 sets out mitigation measures in respect of predicted effects on the water environment.

Noise

Chapter 10 Noise Section 10.6 sets out mitigation measures in respect of predicted effects on the noise environment.

Air Quality

Chapter 11 Air Quality and Climate Table 11-14 sets out mitigation measures in respect of predicted effects on the air quality and climate environment.

4.7 Monitoring measures

Proposed monitoring measures are as set out in Sections 8.7, 9.7, 10.7 and 11.9.

4.8 Residual impacts

4.8.1 Construction Stage

Employment and Economic Activity

The construction of the proposed development is likely to have positive direct effects on employment and economic activity within the construction sector, including contributing to the viability of the enterprises engaged in construction during the period.

The construction of the proposed development is likely to have positive indirect effects on employment and economic activity in services supporting the construction operations e.g. retail and professional services, including contribution to the viability of such retail and professional services during the period.

Land-Use and Settlement Patterns

As set out in this section below it is considered that the operational phase of the proposed development will deliver benefits in respect of broad settlement and land use patterns including supporting the development of the Drogheda Regional Centre in accordance with National Planning Framework policy objectives 2b and 7, enhancing Drogheda's role as a strategic employment centre on the Dublin-Belfast Economic Corridor, contributing economic / employment development towards matching and catching-up on rapid phases of housing delivery in Drogheda in recent years, assisting in counter balancing the level of growth that has taken place in the Southern Environs of the town, and making use of previous investment in infrastructure.

As such, the site is considered suitable in respect of broad settlement and land use patterns for construction activities required to provide the proposed development.

Water Quality

Chapter 8 Water Table 8-10 sets out that, following adoption of the proposed mitigation measures in respect of predicted effects on the water environment, predicted effects during construction on the water environment will be imperceptible in significance. On this basis no likely significant effects on population and human health are anticipated during construction.

Traffic (road safety)

In respect of road safety, Chapter 9 Traffic & Transportation Section 9.5.1 sets out an assessment of sightlines at the access road linking Chapel Lane to the R132 access on the R132, which will be used by construction and operational traffic. This concludes that the required visibility is met. On this basis no likely significant effects on population and human health are anticipated during construction.

Noise

Chapter 10 Noise Table 10-12 sets out that construction stage predicted effects on the noise environment will be moderate (not significant) in significance. On this basis no likely significant effects on population and human health are anticipated during construction.

Air Quality

Chapter 11 Air Quality and Climate sets out at Section 11.7.1 that there will be no residual impacts on air quality or climate as a result of the construction phase. On this basis no likely significant effects on population and human health are anticipated.

4.8.2 Operational Stage

Employment and Economic Activity

The proposed development is anticipated to lead to the creation of approximately 110 jobs. It is considered that this will have likely positive effects on employment and economic activity.

It is considered that the proposed development and associated employment will have likely positive indirect effects on employment and economic activity, e.g. employment in / requirement for suppliers of materials / services supporting the proposed galvanising facility, and employment in / requirement for suppliers of goods / services to the anticipated 110 employees, including contributing to the viability of such enterprises.

Population

It is considered that the employment creation associated with the proposed development will likely support population growth in the area.

Land-Use and Settlement Patterns

In respect of broad settlement and land use patterns, it is considered that the proposed development accords with strategic spatial strategies for growth at national, regional and local levels. In this regard it is highlighted that:

- At national level, it is considered that the proposed development supports the development of the Drogheda Regional Centre in accordance with National Planning Framework policy objectives 2b and 7.
- At regional level, it is considered that the proposed development accords with Eastern and Midland Region Regional Spatial and Economic Strategy Regional Policy Objective 4.14 for the

Drogheda Regional Growth Centre in respect of promoting self-sustaining economic and employment-based development opportunities to match and catch-up on rapid phases of housing delivery in recent years to provide for employment growth and reverse commuting patterns, and Regional Policy Objective 4.18 for the Drogheda Regional Growth Centre in respect of developing new industry on suitable sites to enhance Drogheda's role as a strategic employment centre on the Dublin-Belfast Economic Corridor and provide for employment opportunities.

- At local level, the proposed development is considered as located within the Northern Environs of Drogheda as referenced in the Development Plan[6]. The Development Plan states that the development of the employment and residential lands in the Northern Environs are a fundamental element of the immediate and long-term growth strategy for the town (Development Plan Section 2.13.2). The Development Plan states that the land bank will act as a counter balance to the level of growth that has taken place in the Southern Environs of the town (Development Plan Section 2.13.6). The Northern Environs is considered to contain two areas of undeveloped lands zoned for employment uses, located within the west and east of the Northern Environs area, respectively. In view of this, it is considered that it follows that employment development on the undeveloped lands zoned for employment uses within the west of the Northern Environs – including the application site – is a fundamental element of the immediate growth strategy for Drogheda, particularly as it is considered that the Development Plan indicates (Development Plan Section 5.12.4) there is at present no funding available for completion of the Port Access Northern Cross Route (a road project) as far as the undeveloped lands zoned for employment uses in the east of the Northern Environs, or the water services infrastructure to provide for the release of these lands.
- The application site is provided by IDA Ireland and comprises part of lands at this location to be developed as an IDA Ireland business park (see Section 2.2).
- Pre-planning consultation was undertaken with Louth County Council (see Section 1.7) in respect of zoning policy and Louth County Council advised that the principle of the proposal at this location is acceptable.
- It is also highlighted that the application site context includes (see also Section 2.2) uncompleted access roads and other infrastructure installed on foot of planning permission Reg. Ref.: 071435 / An Bord Pleanála Ref.: PL15.228184 which were intended to serve lands in this area including the application site, representing significant prior investment in this area,

[6] See footnote 1.

and it is considered that the proposed development represents an opportunity to utilise some of this infrastructure, and it is considered that these are positive considerations in respect of the location of the proposed development.

In view of the foregoing it considered that the proposed development will deliver benefits in respect of broad settlement and land use patterns including supporting the development of the Drogheda Regional Centre in accordance with National Planning Framework policy objectives 2b and 7, enhancing Drogheda's role as a strategic employment centre on the Dublin-Belfast Economic Corridor, contributing economic / employment development towards matching and catching-up on rapid phases of housing delivery in Drogheda in recent years, assisting in counter balancing the level of growth that has taken place in the Southern Environs of the town, and making use of previous investment in infrastructure.

Water Quality

Chapter 8 Water Table 8-10 sets out that, following adoption of the proposed mitigation measures in respect of predicted effects on the water environment, predicted effects during operation on the water environment will be imperceptible in significance. On this basis no likely significant effects on population and human health are anticipated during operation.

Traffic (road safety)

In respect of road safety, Chapter 9 Traffic & Transportation Section 9.5.2 sets out an assessment of sightlines at the access road linking Chapel Lane to the R132 access on the R132, which will be used by construction and operational traffic. This concludes that the required visibility is met. On this basis no likely significant effects on population and human health are anticipated during operation.

Noise

Chapter 10 Noise Table 10-12sets out that operational stage predicted effects on the noise environment will be moderate (not significant) in significance. On this basis no likely significant effects on population and human health are anticipated during operation.

Air Quality

Chapter 11 Air Quality and Climate sets out at Section 11.7.2 that the impact of construction and operation of the proposed development is likely to be imperceptible with respect to human health. On this basis no likely significant effects on population and human health are anticipated.

4.9 Interactions with other impacts

Consideration of effects arising on other environmental factors which might affect population and human health is intrinsic to the assessment in this chapter (see also Section 4.2).

Consideration was also given as to whether any effects arising on population and human health could affect the other environmental factors, and no likely significant effects were identified.

4.10 Bibliography

Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency, May 2022.

Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessment, Department of Housing, Planning and Local Government, August 2018.

Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report, European Commission, November 2017.

National Planning Framework, Department of Housing, Planning and Local Government, February 2018.

Eastern and Midland Regional Spatial and Economic Strategy, Eastern and Midland Regional Assembly, June 2019.

Louth County Development Plan 2021-2027, Louth County Council, November 2021.

Labour Force Survey for Quarter 3 2022, Central Statistics Office, November 2022

Quarterly Economic Commentary, Economic and Social Research Institute, October 2022.

Preliminary census 2022 data, Central Statistics Office, June 2022.

5 BIODIVERSITY

5.1 Introduction

This Biodiversity section of the EIAR has been written by Mr. Freddie P.R. Symmons B.Env.Sc. (HONS) MCIEEM – Senior Environmental Consultant and Ecologist of Kingfisher Environmental Consultants. The author has over 28 years professional experience in the project management and writing of EIS/EIAR documents in Ireland and in Ecological Surveys and Reporting. The author is also a *Full Member of the Chartered Institute of Ecology and Environmental Management.* The author also prepared the Appropriate Assessment Natura Impact Statement which accompanies this proposed development.

5.2 Methodology

The field survey and desk-based assessment of the proposed site for the Galvanising Facility at Mell, Drogheda, Co. Louth was undertaken in January 2023. The aims of this Biodiversity section of the EIAR are to:

1 Conduct a review to establish current baseline conditions relevant to biodiversity within the site boundary, and the local surrounding environs;

2 Assess the potential impacts to biodiversity, which can be reasonably expected to occur as a result of the proposed development;

3 Assess the likely impact if any upon protected wildlife sites, namely Natural Heritage Areas; Special Areas of Conservation; and Special Protection Areas for Birds;

4 Recommend suitable mitigation measures to address identified adverse impacts.

This Biodiversity chapter of the EIAR has been prepared with reference to relevant guidance and findings within:

- CIEEM – Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (CIEEM Guidelines 2018).
- Department of Environment, Heritage and Local Government - Notice Nature – Wildlife, Habitats & the Extractive Industry – Guidelines for the Protection of Biodiversity within the Extractive Industry.
- Department of Housing, Planning and Local Government - Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessment, August 2018.
- Environmental Protection Agency - Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, May 2022.

- European Commission - Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report, November 2017.
- Kingfisher Environmental Consultants - Habitats Directive: Stage 2 Appropriate Assessment Natura Impact Statement for Proposed Galvanising Plant at Mell, Drogheda, Co. Louth, (January 2023).

5.3 Difficulties Encountered

No difficulty was encountered in compiling information for this Biodiversity chapter.

5.4 Characteristics of the development

The development will consist of:

"Proposed Galvanising Facility at Mell, Drogheda, Co. Louth".

Hibernia Steel is a family-run, independent steel supplier. They have been in business since 1990 and are based in Grangegeeth, Slane, Co. Meath. They currently supply, cut and drill steel for commercial, manufacturing, agricultural and residential markets.

The proposed development is for a galvanising plant which will complement the existing business. Galvanising is the process of applying a protective zinc coating to steel or iron, to prevent rusting. The proposed (and most common) method is hot-dip galvanising, in which the parts are submerged in a bath of hot molten zinc.

It is planned to process up to 36,000TPA of steel at the plant (it may be less in the first couple of years of operation). All processing will be conducted in-doors. There will be some storage of steel both processed and non-processed out-doors.

5.4.1 Site Location Overview and Existing Description

It is proposed to locate the facility at a 3.419 hectare site at Mell, Drogheda, County Louth. The site is located approx. 2.5 km to the northwest of Drogheda town centre. Please refer to Figure 5-1 for the site in its regional geographical context and Figure 5-2 shows the site of the proposed development in its local context. Figure 5-3 is as an illustrated aerial photo of the current site showing the key local geographical features. To the north is a part-built (currently closed) access road linking Chapel Lane (L6323) to the R132, which will be completed as part of the IDA's plans for the wider lands at this location.

The site is unused and comprises primarily overgrown land. There is an existing concrete pad 164m2 in the north-eastern corner of the proposed site, presumably developed with the previous minor infrastructural works carried out within the wider IDA landholding (prior to acquisition by the IDA).

The site is within a larger land holding owned by the IDA and is zoned General Employment in the Louth County Development Plan 2021-2027. Some internal roads and minor infrastructural works have previously been part built (but not completed) within the wider IDA landholding, with a view to developing a business park. The proposed site comprises part of lands to be developed as an IDA business park.

There are 2 residential properties located adjacent to the western boundary. A minor road known as Chapel Lane runs along the western and southern boundary. The site is bounded to the north by the access road linking Chapel Lane (L6323) to the R132 and to the east by an open field. The surrounding lands comprise predominantly agricultural (tillage and grazing) / unused lands.

The site previously was in agricultural use and then became part of the previously proposed Business Park. At this time, when the site was being prepared for the previously proposed business park, the majority of the site and the lands to the north were cleared and readied for development, which inevitably due to the intervening time period has since become overgrown with scrub, small trees, grasses and brambles.

There are existing hedgerows along the western boundary and these become treelines in parts of the eastern and southern boundary. The site is completely open along the northern boundary. There are footpaths along the access road linking Chapel Lane (L6323) to the R132.

There are overhead power cables traversing the site. In terms of topography, the site is elevated at the northern end compared to the southern end. There is a level difference of almost 10 metres across the site from north to south.

Figure 5-1 1:50,000 Scale Map indicating site location (Source: myplan.ie)

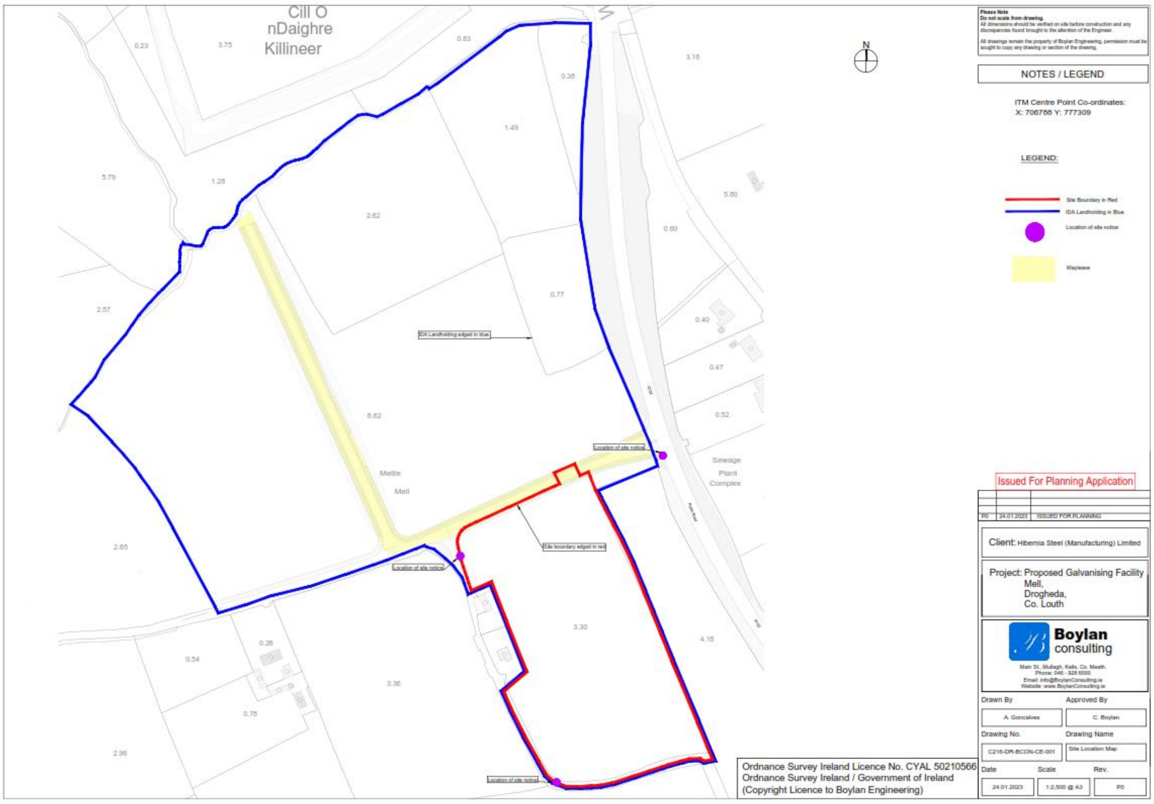

Figure 5-2 Site Location (Source: Boylan Consulting)

Figure 5-3 Aerial Photo of Proposed Site for Galvanising Facility (Source: Bing Maps)

5.4.2 Proposed Development Details

The proposed site layout plan is shown in Figure 5-4. The site infrastructure will include a main building which has a gross floor area of 5719m^2 and is divided into three main sections:

- In-take/out-take section at the southern end of the building. This is single storey and has a maximum height above finished ground level of 14.55m.

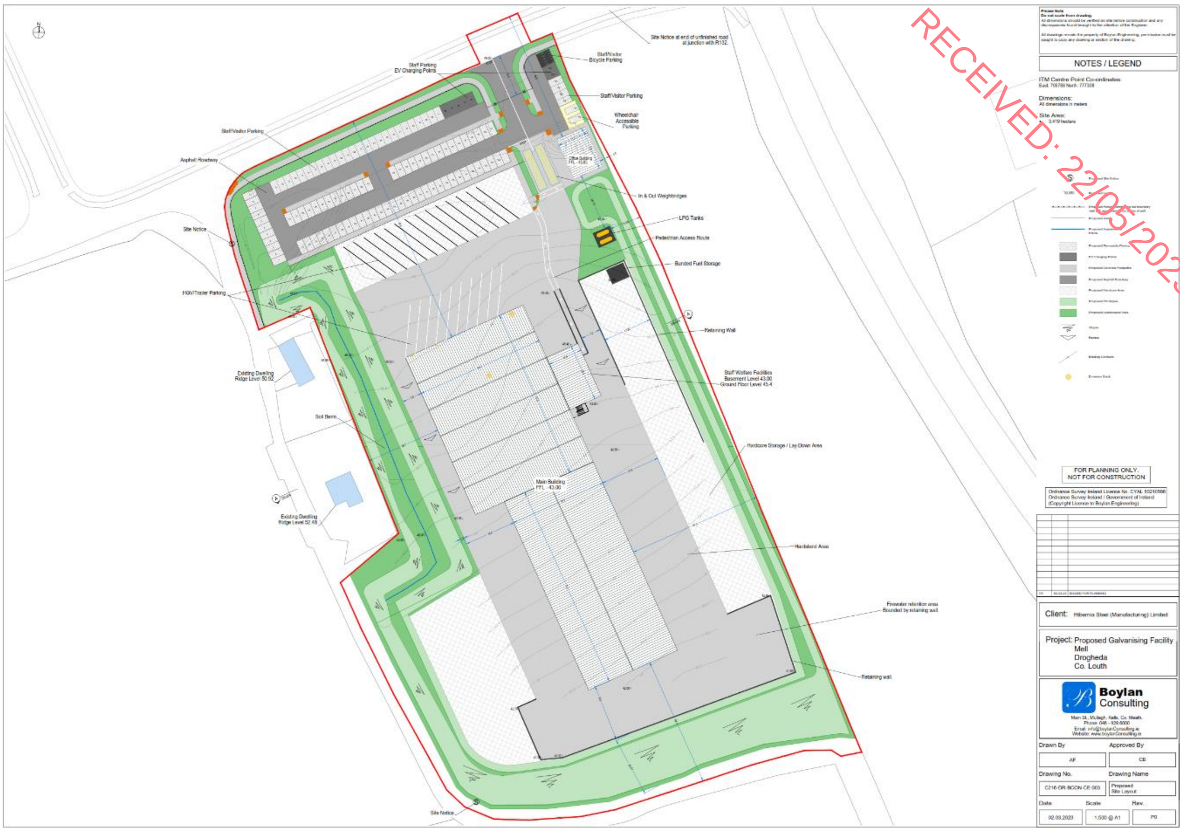

Figure 5-4 Proposed Site Layout Plan (Source: Consulting Engineers for Project)

- Processing & services area at the northern end of the building. This is also single storey with maximum height above finished ground level of 17.30m. The processing area is the area where the steel is pre-treated and galvanised. The services area is where the chemicals are stored, mixed and distributed from. It also contains air abatement infrastructure (acid vapour scrubber & white fumes bag filters) and control panels.
- Welfare facilities, located at north-eastern corner.

The building has been orientated to take advantage of the natural topography of the site. The proposed building heights are for operational reasons and to accommodate required equipment.

The office building is a 2-storey building with a gross floor area of (298m^2) and is provided close to the site entrance.

The proposal also includes:

- Construction of 2 No. stacks to extract flue gases from the main and stand-by furnaces respectively. These will be located on the roof at a height of 20 m above finished floor level (or 63 m aOD).
- Construction of 1 No. stack to extract white fumes from the zinc kettle. Exhaust air will be filtered through bag filters. filtered air from the bag filters will then be exhausted to air at 20 m above finished floor level (or 63m aOD).
- Construction of 1. No. stack to extract exhaust air from the pre-treatment area. Acid vapours produced in the pre-treatment area are passed through a scrubber prior to discharge to air. This stack will be located at 20 m above finished floor level (or 63 m aOD).
- Construction of ESB sub-station within the main building.
- Installation of 2 no. LPG storage tanks.
- Installation of double weighbridge to weigh in-coming and out-going loads of steel.
- Provision of trailer and truck parking spaces.
- Provision of 110 no. visitor and staff parking areas, 2 of which are wheelchair accessible and 7 of which are EV charging locations.
- Provision of 20 no. staff and visitor bicycle parking.
- Provision of concrete yard and additional hardcore yard.
- Installation of stormwater management system.
- Installation of 2 No. rainwater harvesting tanks
- Construction of soil berm.
- Landscaping works
- Firewater retention infrastructure
- Provision of vehicular and pedestrian entrance to the facility, site security fencing and entrance walls and gates.

Hardstanding around the main building consists of an inner area of concrete and an outer gravelled area. Both processed and unprocessed steel will be stored in the gravelled area. The car park is surfaced with asphalt roadways and permeable hardstanding parking spaces allowing for infiltration of storm water from the northern portion of the site.

The entrance to the proposed development is from the access road linking Chapel Lane to the R132 along the north western boundary. This access road is currently closed and in a part-built state. The access road and its junction with the R132 road will be completed as part of IDA Ireland's plans for the wider lands at this location (see Section 2.3.2), and these works do not comprise part of the subject application proposals.

A 3m high soil berm (from finished ground level on the Hibernia side) and a further 1 m high impermeable fence is provided along the western boundary which will reduce any potential visual or noise impacts on adjacent residences.

It is expected that there will be no export of soils off-site. Soils not suitable for use as fill within the site will be used to construct non-structural landscaping berms. Paladin fencing will surround the site and there will be an electric gate at the main entrance and pedestrian gates will be provided either side of the main gate. The plant will be unmanned outside of operational hours however monitored cameras will be provided.

Electrical power, lighting and space heating will be provided via the electricity network. The installed capacity requirements for the site is 950kVa. This refers to the installed power and not to the effective/average consumption. It is expected that the absorbed value will be approximately half of the installed one because all of the equipment will not be used concurrently. The facility will consume approximately 810,000kWh/yr of electrical power. An ESB substation will be constructed within the main building.

Liquid petroleum gas (LPG) will be used to fuel the furnace for heating the zinc kettle, pre-treatment tanks and drier. LPG will be stored on site in 2 No. 2T tanks. 720,000m^3 gas per annum will be consumed by the facility.

Domestic wastewater generated at the facility will be connected to the Irish Water sewer system. The subject application proposals include for foul water services within the application site as far as the application site boundary. Onward connection between the wider IDA lands and the Irish Water network will be completed as part of IDA Ireland's plans for the wider lands at this location (see Section 2.3.5), and these works do not comprise part of the subject application proposals.

Potable water will be supplied from the public mains. The subject application proposals include for water services within the application site as far as the application site boundary. Onward connection between the wider IDA lands and the Irish Water network will be completed as part of IDA Ireland's plans for the wider lands at this location and these works do not comprise part of the subject application proposals. Non-potable water is supplied from rainwater harvesting and from public mains.

Firefighting water will be obtained from hydrants from the potable water supply, discussed above.

Fuel for mobile plant (forktrucks) will be stored within a bunded area, refuelling will be carried out on hardstanding area with appropriate spill kit materials available on-site.

In respect of IDA Ireland's plans for the wider IDA lands at this location mentioned above, IDA Ireland has advised it will be carrying out an entire infrastructure enhancement project, which is endorsed by the IDA Board and capital expenditure plans in 2023. IDA Ireland has advised it has published its tender to complete the works (closing date 31st May 2023), and forecasts completion of the works in early Q1 2024.

The storm water management design is provided in the Proposed Drainage Layout Drawing accompanying the Planning Application. Infiltration rates in the northern portion of the site are favourable. The catchment consisting of the upper portion of the site (from the northern gable of the shed heading north) is managed by infiltration to ground as the infiltration rates in this area are suitable. There are two proposed mediums/methods of infiltration;

- Permeable parking bays designed to manage 100 year +20% climate change. Satisfying 24-hour half drain time.
- SC310 Stormtech units dealing with upper concrete yard and asphalt entrance road, designed to manage 100 year +20% uplift for climate change. Satisfying 24-hour half drain time.

Any runoff from roads and yard will pass through an appropriately sized full retention interceptor.

Clean roofwater will be captured in rainwater harvesting tanks and used in the office and welfare building toilets and for processing purposes.

The infiltration rates at the lower (southern) end of the site are much poorer than in the upper portion of the site and it is therefore proposed to use a concrete attenuation tank with a controlled discharge to the drain that runs along the southern edge of the site. The system is designed to discharge at a rate of 13.5 l/s and is designed to ensure the run-off post development is similar to that prior to development.

The attenuation tank will be sized to manage 100 year event +20% uplift for climate change. All run-off from the concrete yard will pass through an appropriately sized full retention interceptor prior to discharge to the attenuation tank.

All discharge from the attenuation tank will be controlled via a Hydrobrake. A shut off valve will be installed after each interceptor to withhold surface water run-off in the unlikely occurrence of a potential contamination event.

In general the galvanising process consists of the following steps:

- Stripping (acid bath) (HCl) to remove zinc and other impurities
- Degreasing (alkaline bath) (TIB Clean-A 300).
- Rinse
- Pickling to remove iron oxides & scales (acid bath) (HCl)
- Rinse
- Fluxing to prepare surfaces for the metallurgical phase by applying a saline layer that facilitates the Iron-Zinc bonding process. (Double salts $ZnCl_2$ & NH_4Cl)
- Galvanising – immersion in molten zinc. Zinc kettle approx. 14.5mx1.8mx3m. The zinc is slowly heated to the melting point of Zn (ca. 450^{0}C) and maintained at that temperature. The Zinc kettle will rarely be shut down.
- Passivation is an optional step to prevent the formation of iron oxides post galvanisation.
- Buffering

The degreaser tank, rinsing tank and fluxing tank all have heating units. The zinc kettle has a high velocity furnace. LPG is used for heating purposes. 2 x 2T LPG tanks will be provided on-site.

Acid vapours from the Process Area are vented through a scrubber prior to discharge to atmosphere.

Flue gases from the gas furnace are passed through a heat economizer and ventilator prior to discharge to the atmosphere.

White fumes (dust) are generated by the immersion of steel into molten zinc. These fumes are segregated inside the hood above the zinc kettle and are sucked by a ventilation system through a bag filter. Filtered air is then discharged to the atmosphere.
The proposed opening hours of the facility are 6.30 am to 8.00 pm Monday to Friday and 08.00 am to 01.00 pm on Saturdays. The processing plant operational hours will be restricted to 07.00 am to 05.00 pm on weekdays.

The facility will not be opened on Sundays or bank holidays. There will also be an additional 10 days of shutdown per annum. This time will be used for general maintenance around the facility.

Diesel and chemicals will be stored in bunded structures to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area
- 25% of the total volume of the substances stored within the bunded area.

Wastes likely to arise during the operational phase include chemicals from pre-treatment operations, white dust from galvanising process, general office and canteen waste and packaging materials from raw materials. Periodically waste materials will arise due to equipment maintenance.

Waste chemicals will be stored in the services area in designated containers prior to collection by an authorised contractor for disposal or recovery.

White dusts are contained within the filter bags until collected by an authorised waste collector for disposal.

Source segregated skips will be provided for packaging materials and other dry recyclables.

Where materials cannot be source segregated, general skip receptacles will be provided. All wastes arising on site will be collected by authorised collectors only and recovered at authorised facilities only.

Wastewater from the oil interceptor will be collected on scheduled basis by an authorised contractor.

5.5 Receiving environment

5.5.1 Site Habitat Survey

The ecology of the existing site at Mell, Drogheda, County Louth has been described in accordance with *Fossit, J.A., 2000. A Guide to Habitats in Ireland, The Heritage Council, Kilkenny.* The author visited the site and carried out a habitat assessment and walk over survey on 24th January 2023.

In addition, the following references have been used in the preparation of this habitat description:

- Devlin, Z. 2014. The Wildflowers of Ireland – A Field Guide: The Collins Press, Cork.
- Harrap, S, 2013. Harrap's Wild Flowers – A Field Guide to Wild Flowers of Britain & Ireland. Bloomsbury, London.
- Hubbard, C. E. 1992. Grasses: A Guide to their Structure, Identification, Uses and Distribution in the British Isles.
- Jermy, A. C., Chater, A. O. & R. W. David. 1982. Sedges of the British Isles: BSBI Handbook No. 1. BSBI, London.
- Joyce, P. M. 1998. Growing Broadleaves – Silvicultural Guidelines for Ash, Sycamore, Wild Cherry, Beech & Oak in Ireland. Coford, Dublin.
- Smith, A. J.E. 1978. The Moss Flora of Britain & Ireland. Cambridge University Press, Cambridge.
- Stace, C. A. 1991. New Flora of the British Isles.
- Streeter, D. 2016. Collins Wild Flower Guide 2nd Edition – The Most Complete Guide to the Wild Flowers of Britain and Ireland. William Collins, London.
- Webb, D. A. Parnell J. & D. Doogue. 1996. An Irish Flora. Dundalgan Press Ltd., Dundalk.
- www.wildflowersireland.ie

The existing site habitat survey is shown in Figure 5-5 and is based on a recent aerial photograph of the site combined with field evidence and field habitat survey works which are superimposed on the site area.

It is important to stress that this site previously was in agricultural use and as set out previously in Section 5.4.1 then became part of a previously proposed Business Park. At this time, when the site was being prepared for the business park (ca. 2008-2010), most of the site and the lands to the north were cleared and readied for development, which inevitably due to the intervening time period has since become overgrown with scrub, small trees, grasses and brambles. Therefore the site has undergone habitat changes over a relatively short time period of ca. 13-15 years. The site habitats are all typical of disturbed ground that is recolonising due to years of neglect and lack of use and all habitat types merge into each other as natural succession has taken place on site.

Figure 5-6 shows the site shortly after it was cleared and stripped for the Business Park (year unknown but thought to be ca. 2008-2010 (*pers comm*.).

The current site habitats consist of the following elements:

Habitat FW4 – Drainage Ditches

In the north-western corner of the site is a man-made drainage ditch (artificial) which must have been dug during the site clearance works back when the site was being first cleared for the previously proposed Business Park. This small drain runs is ca. 1 to 1.5 m wide with ca. 20 cm depth of stagnant water present – see Figure 5-7. There is no obvious flow and the open ditch does not support any aquatic plants. This drain flows to the side road on the western boundary where it appears to collect. It is uncertain whether there is a culvert at the road and the connectivity with known streams in the area is uncertain. The plants in the vicinity of this drainage ditch include common grasses, Gorse (*Ulex uropaeus*), young Ash saplings (*Fraxinus excelsior*), young Grey or Pussy Willow (*Salix cinerea*), Brambles (*Rubus fruticosus agg*.); Rushes (*Juncus spp*.); and Common Dock (*Rumex abtusifolius*) As this drain is a man-made feature and is not in flow, it has little if any conservation value and is likely to dry up completely in dry weather.

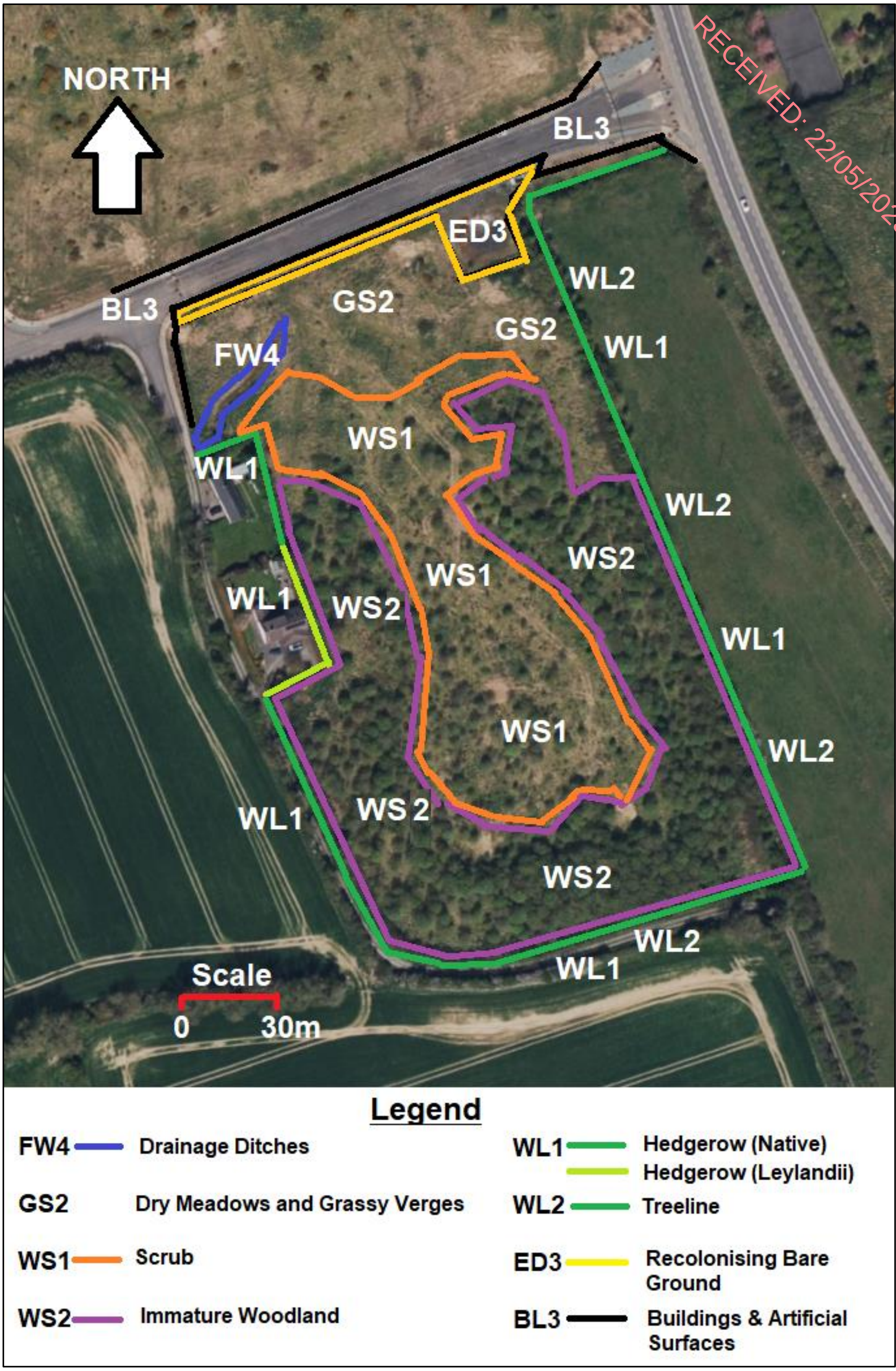

Figure 5-5 Current Site Habitat Survey (Aerial Photo sourced from Bing Maps)

Figure 5-6 Aerial Photo of Habitats on Site ca. 2008-1010 after Site Clearance Works for the previously proposed Business Park (Source: myplan.ie)

Figure 5-7 Artificial Drainage Ditch on Site (Habitat FW4)

Habitat BL3 – Buildings & Artificial Surfaces

Forming the northern boundary to the proposed site is a concrete footpath and tarmacadam road as shown in Figure 5-8. This area is currently not driven on as the access is blocked off at the R132 by large boulders and barriers. In parts of the footpath and edge of the road, common weed or ruderals are present occasionally including Moss species and Grasses including Bents and Fescues growing on the concrete and tarmac pavement in un-trafficked areas. Other plants include occasional Brambles (*Rubus fruticosus agg.*) along with small Willowherb (*Epilobium spp*.); Buddleia (*Buddleja davidii*); Dandelion (*Taraxacum spp.*), Creeping Buttercup (*Ranunculus repens*), Greater Plantain (*Plantago major.);* Ribwort Plantain (*Plantago lanceolata*); Nettle (*Urtica dioica*); Clovers (Trifolium spp.); Black Medic (*Medicasgo lupulina*); Daisy (*Bellis perennis*); Thistles (*Cirsium spp*); and Docks (*Rumex spp.).* Artificial surfaces such as roads and footpaths have little biodiversity value and are present to act as hard surfaces for vehicles and pedestrians respectively. Where this area has greater than 50% plant cover it merges into habitat type **ED3 – Recolonising Bare Ground.** The built areas of the proposed site and the roads and carparking areas will become habitat type **BL3 – Buildings & Artificial Surfaces**. Where it is proposed to have green areas and landscaping then these will change to habitat type **BC4 – Flower Beds and Borders** and **GA2 Amenity Grassland (improved).**

Figure 5-8 View of Northern Boundary of Site which is the Footpath and Part Built Access Road which is Habitat Type BL3-Buildings & Artificial Surfaces

Habitat ED3 – Recolonising Bare Ground

The site was all cleared in preparation for the development of the previously proposed Business Park in ca. 2008 – 2010 and as such most of the site was stripped and bare. In the north-east corner of the site there is a hardstanding concrete and tarmac area as shown on Figure 5-8 and Figure 5-9**.**

Over time this part of the site and a strip of land bordering the footpaths has been partially recolonised by ruderals. Vegetation cover should be greater than 50% for inclusion in this category. This habitat category is used for any areas where bare or disturbed ground, derelict sites or artificial surfaces of tarmac, concrete or hard core have been invaded by herbaceous plants.

The typical plant species are those found in **Habitat BL3 – Buildings & Artificial Surfaces,** but in greater profusion. Also present are several small Grey or Pussy Willow saplings (*Salix cinerea*). As this area of the site contains primarily common weed species it is not considered to have any particular biodiversity value and is common within the area. This habitat type merges with habitat type **GS2 – Dry Meadows and Grassy Verges** as one moves from north to south into the site and is an earlier sere (stage of succession) of the grassland habitat.

Figure 5-9 Habitat ED3 – Recolonising Bare Ground at the North-Eastern and Northern Portion of the Site

Habitat GS2 – Dry Meadows and Grassy Verges

Within the northern higher section of the site (where the land rises from the northern road to the intersecting power lines across the site, and along the site hedgerows and treelines the habitat becomes more grass dominated and tussocky. The main area of this habitat type is where the land rises in elevation and is uneven and is dryer underfoot – see Figure 5-10 which shows this habitat type **GS2 – Dry Meadows and Grassy Verges**. This area was previously farmland which was stripped for development and then has reverted back to grassland through succession from **Habitat ED3 – Recolonising Bare Ground.** This habitat merges with the **Drainage Ditch (FW4)** and further south into the site into habitat type **WS1 – Scrub.**

This type of grassland is now best represented on grassy roadside verges, on the margins of tilled fields, on railway embankments, in churchyards and cemeteries, and in some neglected fields or gardens. These areas have little or no grazing or fertiliser application. This pattern of management produces grasslands with a high proportion of tall, coarse and tussocky grasses such as False Oat-grass (*Arrhenatherum elatius*) and Cock's-foot (*Dactylis glomerata*). Other grasses include Yorkshire-fog (*Holcus lanatus).*

The broadleaved herb component is characterised by a range of species that grow tall, such as Hogweed (*Heracleum sphondylium*), Nettle (*Urtica dioica*), Common Knapweed (*Centaurea nigra*); Thistles (*Cirsium spp*); Meadowsweet (*Filipendula ulmaria*); Willowherbs (*Epilobium spp*.); Rushes (*Juncus spp*.); Common Dock (*Rumex abtusifolius*) and occasional Buddleia (*Buddleja davidii*); Larger plants are found scattered through this habitat and include Gorse (*Ulex uropaeus*), young Ash saplings (*Fraxinus excelsior*), young Grey or Pussy Willow (*Salix cinerea*), and Brambles (*Rubus fruticosus agg*.).

Other plants present include climbers such as Cleavers (*Galium aparine*); Bush Vetch (*Vicia sepium);* and Meadow Vetchling *(Lathyrus pratensis).* There is one isolated patch of red stemmed Dogwood *(Carnus sanguinea)* to the northwest of this habitat type and may be introduced through human intervention.

This habitat type has low to medium biodiversity value and will principally become the main carparking areas and road of the site and will become habitat type **BL3 – Buildings & Artificial Surfaces.**

Figure 5-10 Habitat GS2 – Dry Meadows and Grassy Verges in the Northern central part of the Proposed Site

Habitat WS1 – Scrub

The dry grassland areas of the site extends in a southerly direction from the northern road boundary and then gradually become more overgrown and dominated by impenetrable thicket comprising of Brambles (*Rubus fruticosus agg*.); Gorse (*Ulex uropaeus*), young Ash saplings (*Fraxinus excelsior*), young Grey or Pussy Willow (*Salix cinerea*); Blackthorn (*Prunus spinosa*); Hogweed (*Heracleum sphondylium*); Dog Rose (*Rosa canina),* Nettle (*Urtica dioica*); and also occasional Silver Birch (*Betula pendula*). This is **Scrub WS1** habitat and is shown in Figure 5-11.

This broad habitat category includes areas that are dominated by at least 50% cover of shrubs, stunted trees or brambles. The canopy height is generally less than 5 m, or 4 m in the case of wetland areas. Scrub frequently develops as a precursor to woodland and is often found in inaccessible locations, or on abandoned or marginal farmland as is the case on this site. In the absence of grazing and mowing, scrub can expand to replace grassland as is happening on this site. Trees are included as components of scrub if their growth is stunted.

If tall trees are present, these should have a scattered distribution and should not form a distinct canopy. This category does not include areas that are dominated by young or sapling trees (<5 or 4 m in height) or young conifer plantations (see **Immature woodland – WS2**).

Scrub can be either open, or dense and impenetrable, and it can occur on areas of dry, damp or waterlogged ground. Common components include spinose plants such as Blackthorn (*Prunus spinosa*); Gorse (*Ulex europaeus*); Bramble (*Rubus fruticosus agg*.); and erect or scrambling roses (*Rosa spp*.). In addition, there are often colonising tree species such as willows (*Salix spp*.) and small birches (*Betula spp.*)

The field layer is often impoverished and poorly-developed but, in some situations, may be similar to that of woodland.

Figure 5-11 View of Willow, Blackthorn, Birch, Ash and Bramble dominated Scrub Habitat (WS1) on Site which dominates the central interior of the site

The **Scrub WS1** habitat merges continually into the **Immature woodland – WS2** which primarily consists of Grey or Pussy Willow (*Salix cinerea*) and forms more of a complex between the two habitats depending on the tree cover. The habitats are similar except the density of saplings and trees in immature woodland is greater and is the next sere in natural habitat succession. In places the **Scrub WS1** habitat merges with the precursor habitat type which is **GS2 – Dry Meadows and Grassy Verges.**

Scrub WS1 in the context of this site at Mell, Drogheda is an indication of lack of use of a site and neglect in terms of land management. It is never the intention for a site to be allowed to revert to scrub in the same way a derelict house and gardens will revert to scrub without management and intervention with grazing or cutting. The site was not scrub before and the aerial photograph from ca. 2008-2010 shows that the site was entirely clear of vegetation save for the boundary hedgerows and treelines.

Scrub WS1 has no particular conservation value in a regional context, but locally it can provide cover for small mammals such as mice, rabbits and foraging foxes and feeding opportunities for small birds. However, having walked the site, there is no evidence of widespread use of the scrub in terms of nesting or feeding except maybe by visiting foxes for whom the site forms part of a larger range.

As the Scrub habitat is mainly in the central area of the site, this area will be cleared and will become the main area for the buildings on site and will change to another non-priority habitat type - **BL3 – Buildings & Artificial Surfaces.**

Habitat WS2 – Immature Woodland

The southern, western and eastern portions of the site are typified by immature tree saplings and young trees principally of young Grey or Pussy Willow (*Salix cinerea*); Blackthorn (*Prunus spinosa*); young Ash saplings (*Fraxinus excelsior*), and also occasional Silver Birch (*Betula pendula*). This is shown in Figure 5-12. This habitat type is a mix of scrub becoming **Immature Woodland (WS2)**. Immature woodland includes areas that are dominated by young or sapling trees that have not yet reached the threshold heights of 5 metres plus.

Figure 5-12 Habitat WS2 – Immature Woodland with principally Grey or Pussy Willow (Salix cinerea); Blackthorn (Prunus spinosa); young Ash saplings (Fraxinus excelsior), and also occasional Silver Birch (Betula pendula).

The ground flora is not well developed and consists of a well deposited leaf layer with occasional Grasses and Mosses, Ivy (*Hedera helix*); Rushes (*Juncus spp*.); Dog Rose (*Rosa canina),* Nettle (*Urtica* *dioica*); and Buttercup (*Ranunculus spp*.). There is a distinct lack of impenetrable thicket which is more associated with the accompanying **Scrub WS1** habitat.

As part of the proposed development works during the construction phase it is proposed to clear this vegetation ready for setting out and creating the correct site levels for construction works. Most of the trees, especially willow, ash, blackthorn and birch are only here due to lack of use of the site and opportunities to naturally colonise the site through self-seed dispersion and the colonising nature of these species. Whilst the immature woodland is quite extensive on site, it does not take many years for a site to revert back to this habitat type which in this case has been over a ca. 13 – 15 year period based on aerial photography (i.e the site was previously fully cleared).

The **WS2 – Immature Woodland** will provide suitable biomass for firewood when felled and cleared and will be used purposefully. Where this woodland exists on site, this will change to a mixture of **BL3 – Buildings & Artificial Surfaces** and landscaping and embankments which come under habitat types **BC4 – Flower Beds and Borders** and **GA2 Amenity Grassland (improved).**

Based on the field evidence gathered and the natural succession occurring on the site, this immature woodland has low to medium biodiversity value in a local context but does not provide extensive foraging areas for animals or birds, and little if any birdlife was evident except for occasional Rook activity with evidence of white bird faeces on the ground. Where the **WS2 – Immature Woodland** is close to the perimeter boundaries, it merges into the hedgerows and treelines which will remain as part of the development. Therefore, any mature trees which are within the boundary treelines and not on site such as principally Ash (*Fraxinus excelsior*) and Blackthorn (*Prunus spinosa*) will remain post development.

Habitat WL1 Hedgerows and WL2 Treeline

The southern, western and eastern boundaries are typical overgrown rural hedgerows and treelines which form liner habitats **WL1 Hedgerows** and **WL2 Treeline. See** Figure 5-13**.**

Figure 5-13 WL1 Hedgerows and WL2 Treeline in the southwestern corner of the site

From Figure 5-5 it can be seen that the western boundary (around the 2 no. dwelling houses) is principally overgrown hedgerow with the occasional large Ash tree (*Fraxinus excelsior*). The dwelling house to the south is separated from the development site by a non-native hedgerow comprising of a tall Leylandii hedge interspersed with trailing Bramble (*Rubus fruticosus agg*.). At the foot of this hedgerow on the western boundary is a small area of grassy verge more similar to **GS2 – Dry Meadows and Grassy Verges** with common plants such as Hogweed, Nettles, Ivy and Cleavers.

Tree species common in the hedgerows and treelines of the southern and eastern boundaries consist mainly of Ash (*Fraxinus excelsior*) and Blackthorn (*Prunus spinosa*) which are typically very densely covered in Ivy (*Hedera helix*). Some of the western boundary is typified by large and overgrown Bramble bushes (*Rubus fruticosus agg*.). There are also interspersed sections of Dog Rose (*Rosa canina).* The understorey is typified by Hogweed, Cleavers, Nettles, Thistles and Vetches which are all commonly found plants along field and hedgerow margins.

As the hedgerows are beneficial to wildlife and act as wildlife corridors for mammals and birds, they are remaining intact as part of the site development proposal as they also serve as screening and noise buffers and any security fencing will be emplaced inside the hedgerows as part of the construction works.

The site habitat survey has demonstrated that the habitats on-site have low to medium biodiversity value and are non-priority habitats for conservation and are not listed in the Habitats Directive.

Avifauna

During the site survey, several bird species which are common and found throughout Ireland were observed. These birds are typical of Irish farmlands and are found in both hedgerows and open fields typical of this habitat type. They include species such as the Grey crow *Corvus corone cornix*, Wood Pigeon *Columba palumbus*, Blackbird *Tudus merul*), Rook *Corvus frugilegus*, Magpie *Pica pica*, Blue tit *Parus caeruleus*, Chaffinch *Fringilla coelebs*, Wren *Troglodytes troglodytes*, Bullfinch *Pyrrhula pyrrhula* and Robin *Erithacus rubecula*.

Mammals

During the site visit in January 2023 there was evidence of Rabbits *Oryctolagus cuniculus* in the general area of the site probably due to extensive scrub within the site. It is likely that the site is frequented by Foxes *Vulpes vulpes,* Stoat *Mustela erminea.* Badgers *Meles meles* may visit the site as part of a larger territory but none were observed on site nor was there any evidence of them. Both Field mice *Apodemus sylvaticus* and Brown rat *Rattus norwegicus* are probably also present. There are no suitable habitats within the proposed site to act as a habitat for bats as the willow dominated immature woodland is young and transitional. However bats may forage and feed along the perimeter hedgerows and treelines as part of a larger territory and it is intended to leave these intact.

Insects

Different species of Butterfly may fly over the site as part of their wider territory. In January 2023 due to the time of the year of the site survey, no butterflies were observed, but it is likely that several common species of butterfly *Lepidoptera* visit the site including Cabbage White and Tortoiseshell.

Amphibians

There was no evidence of amphibians on-site and even though there is a man-made drainage ditch to the north-west corner of the site, this will be removed during site construction works. There are no other ponded areas on site which could provide suitable breeding habitat for the Common Frog *Rana* *temporarya* or for Newts. As the site has no connecting streams, the site does not serve as part of the habitat for amphibians.

In summary, none of the habitats or species of flora and fauna found within the proposed site at Mell are listed being protected species and none are worthy of specific conservation.

5.5.2 Site Hydrology and Surface Water Connectivity

Information pertaining to the site's hydrology both in a local and regional context has been derived from field evidence and the EPA Water Maps on-line – see Figure 5-14.

In addition, information was sought from Envirologic who have been engaged to assess the EIAR chapter relating to Water for the proposed development of the Galvanising Facility.

The proposed site for the galvanising facility is located within the River Boyne Catchment area which flows in a west to east direction ca. 1. 5 km south of the site. However, from the EPA Hydrology maps for the area, there appear to be no main streams or rivers in close proximity to the site – therefore any connectivity is on a localised level.

From information provided by Envirologic Consultants, the following has been determined with regards to localised surface water drainage.

The site slopes predominantly from north to south, with the exception of the northernmost 50 m which slopes to the north. An open field drain is located adjacent to the southern site boundary. Rainfall-runoff generated on the south-sloping portion of the site enters this field drain, which directs water eastwards along the southern boundary before turning south, along the eastern side of the local road.

This open channel continues for a distance of approximately 135 m alongside the eastern margin of the local road before being culverted westwards beneath the local road. This road culvert was observed as having collapsed. It appears to have been a circular culvert with diameter of approximately 300 mm though this was difficult to confirm due to the collapsed condition and it being submerged.

Figure 5-14 The hydrology of the site area at Mell (Source: EPA Maps)

At the downstream end of this culvert (western side of local road) waters merge with the outfall from an open drain on the western side of the local road (300 mm diameter culvert). Having merged, rainfall-runoff flows westwards before being culverted again within a short distance (5 m west of the local road) via a 0.5 m x 0.5 m box culvert. This short culvert serves as a field crossing. A brief schematic of this arrangement is shown in Figure 5-15.

Figure 5-15 Drainage arrangement beneath local road south of site

The local drainage network subsequently enters private agricultural lands and due to restricted access it proved difficult to observe the downstream routing between the local road culvert described above and the main channel of the Mell Stream. Based on aerial imagery two potential routes are presented in Figure 5-16:

(i) the stream flows directly west and outfalls directly to the Mell Stream north of the N51/L6322 roundabout, or

(ii) the stream flows south and enters N51 drainage infrastructure before entering the Mell Stream close to the N51/L6322 roundabout. In either scenario rainfall-runoff from the site is hydrologically connected to the Mell Stream.

The northernmost (50 m) part of the site contains proposed car parking and proposed truck parking areas. Rainfall-runoff generated in this area is currently directed towards the stormwater infrastructure along the access road linking Chapel Lane to the R132.

Figure 5-16 Drainage Network Downstream of Site

A 65 m long open channel was noted in the northwestern corner of the site, appearing to emanate from one of the two adjacent residences. Aerial imagery suggests that this channel was installed in the period 2007 – 2011, possibly at the time of development of roads and infrastructural works, possibly to capture rainfall-runoff flowing in a northwest direction. The channel falls in a northerly direction towards the stormwater infrastructure along the access road linking Chapel Lane to the R132. Surface water was observed in the channel but not flowing.

Engineering drawings prepared in 2008 shows that the existing stormwater infrastructure along the northern site boundary consists of a 225 mm pipe that falls from northeast to southwest. This pipe outfalls to the Mell Stream 450 m west of the site. Lands further to the north drain to a separate tributary of the Mell Stream. The application site does not propose to connect to this drainage infrastructure. The contributing catchments to each of the routings discussed above have been inferred in Figure 5-17.

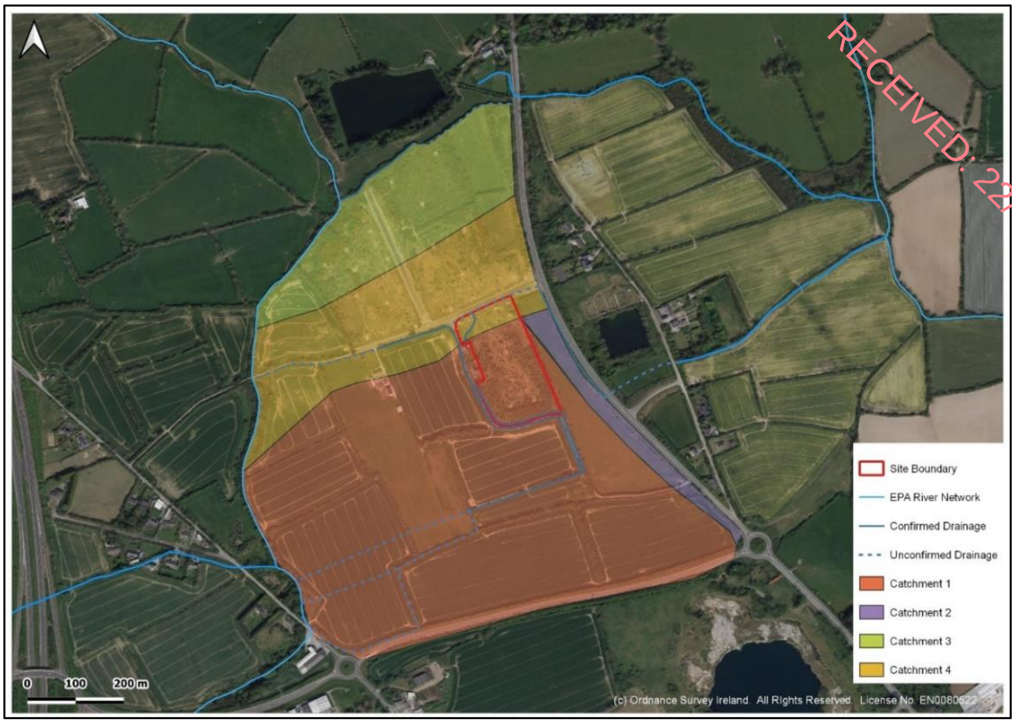

Figure 5-17 Estimated catchments of local channels

The Mell Stream (EPA Code: 07_1902) flows in a general southerly direction and outfalls to the River Boyne ca. 1.5 km southwest of the site (as the crow flies). In terms of hydrological connectivity the River Boyne is 2.6 km downstream of the application site. Hence the application site is located within the Boyne catchment (HA07). The site does not appear to be hydrologically connected to the Yellowbatter River (EPA Code: 07Y04) which is mapped as flowing 250 meters to the east of the site.

For WFD purposes the Mell Stream is referenced by the EPA as the Tullyeskar_010 which is characterised by the EPA under WFD criteria as follows:

- WFD Risk 3rd Cycle = 'Under Review'
- River Significant Pressures = Agriculture & Urban Runoff
- Status = Moderate Status (2016 to 2021).

Domestic wastewater generated at the facility will be connected to the Irish Water sewer system. The subject application proposals include for foul water services within the application site as far as the application site boundary. Onward connection between the wider IDA lands and the Irish Water network will be completed as part of IDA Ireland's plans for the wider lands at this location, and these works do not comprise part of the subject application proposals.

During the construction phase portable toilets will be utilised and emptied as appropriate by a licensed contractor.

There is currently no on-site stormwater infrastructure. Rejected rainfall on the south-sloping part of the site is currently collected in an open drain on the southern boundary.

A shallow east-west ridge set back 50 m from the northern boundary defines a north-south catchment divide within the site. Boylan Engineering commissioned infiltration testing in December 2022/January 2023 with a view to informing optimal stormwater management design. The results have guided a stormwater management scheme tailored towards the different subsoil infiltration properties in the northern and southern parts of the site.

Infiltration rates in the northern part of the site are sufficient to dispose of all stormwater generated in this area to ground. This area is primarily parking and the following infiltration approaches are proposed:

- Permeable parking bays for cars and some truck parking is designed to manage 1 in 100 year rainfall plus 20% climate change growth factor.
- 378 no. SC310 Stormtech units (footprint 941 m^2; volume 235 m^3) to manage runoff generated on internal access roads (asphalt) in the northern part of the site, upper concrete yard and asphalt road entrance. These units are designed to manage 1 in 100 year rainfall plus 20% climate change growth factor.
- Clean rainfall on main building roof will be captured in a rainwater harvesting tank and will be used in toilets and for processing purposes.

Infiltration rates in the southern part of the site are lower than in the northern area. It is therefore proposed that rainfall-runoff generated in the southern part of the site will pass through an attenuation storage device before being released to a field drain along the southern field boundary at greenfield runoff rates via a hydrobrake. Specifications are briefly as follows:

1. Area = 2.22 ha;
2. Concrete attenuation tank sized to accommodate 1 in 100 year rainfall plus 20% climate change growth factor (footprint 210 m^2, volume 380 m^3);
3. Outflow from attenuation tank restricted to QBAR (13.5 l/s) using a hydrobrake;

4. No increase above current rainfall-runoff rates for storm events with a return period of less than 100 years;
5. Clean rainfall on roof of main building and office will be captured in a rainwater harvesting tank and used for processing purposes and toilets.
6. Outfall from hydrobrake will discharge to southern boundary drain at southeastern corner of site.

All rainfall-runoff generated on internal roads (asphalt) and upper concrete yard will pass through an appropriately sized full retention hydrocarbon interceptor (NSFA080 or similar approved).

All rainfall-runoff generated on the lower concrete yard will pass through an appropriately sized full retention hydrocarbon interceptor (NSFA200 or similar approved).

A shut off valve is proposed to be installed after the attenuation device in the southern part of the site. A shut off valve shall be installed on the outlet of the interceptor in the northern part of the site. The shut-off valves are used to withhold surface runoff during a potential contamination event (e.g. spillage, fire).

Firefighting water will be obtained from hydrants from the potable water supply, discussed above. In the unlikely event of a fire the stormwater attenuation tank and lower yard will be used to retain fire water. The valves in the attenuation tank will be shut off to prevent migration of contaminated fire water to surface water. This will be constructed in accordance with 'Guidance on Retention Requirements for Firewater Run-off' (EPA, 2019).

5.5.3 Designated Sites

Natural Heritage Areas

Figure 5-18 and Table 5-1 shows the proposed Natural Heritage Areas (pNHA) and Natural Heritage Areas within a 15 km distance of the proposed development at Mell, Drogheda, Co. Louth.

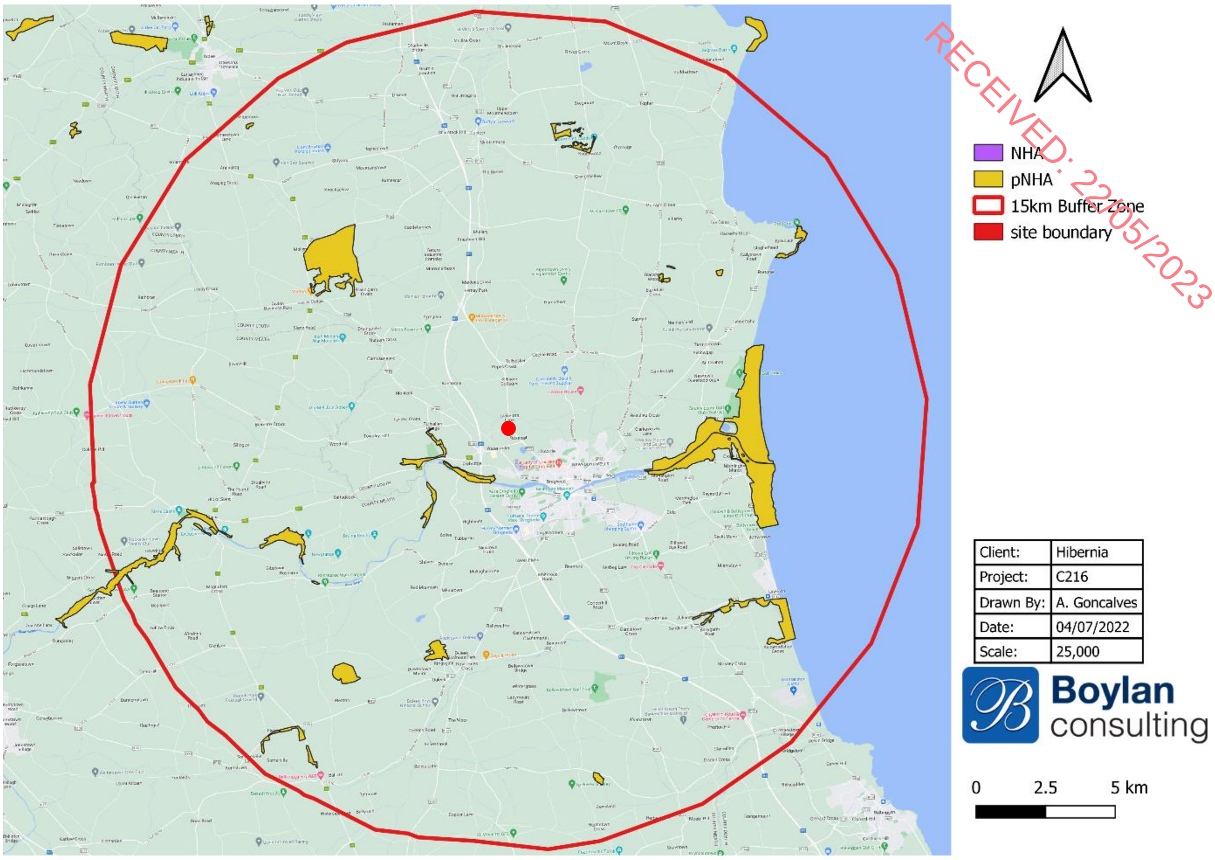

Figure 5-18 NHAs and pNHAs within 15km of the Proposed Development

Table 5-1 NHAs and pNHAs within 15km of proposed development

Designation	Number	Approximate closest location from the Application Site
Boyne Coast and Estuary (east direction)	pNHA (001957)	4.2km East
Mellifont Abbey Woods (North west direction)	pNHA (001464)	7.1km North west
King William's Glen (west direction)	pNHA (001804)	2.7km West
Boyne River Islands (South west direction)	pNHA (001862)	2km South west
Dowth Wetland (South west direction)	pNHA (001861)	3.6km South west
Crewbane Marsh (South west direction)	pNHA (000553)	8.5km South west

Boyne Woods (South west direction)	pNHA (001592)	10.8km South west
Duleek Commons (South direction)	pNHA (001578)	8.1km South
Thomastown Bog (South west direction)	pNHA (001593)	10.4km South west
Balrath Woods (South west direction)	pNHA (001579)	13.1km South west
Cromwell's Bush Fen (South east direction)	pNHA (001576)	12.9km South east
Laytown Dunes/Nanny Estuary (South east direction)	pNHA (000554)	9.5km South east
Blackhall Woods (North east direction)	pNHA (001293)	7.6km North east
Castlecoo Hill (North east direction)	pNHA (001458)	9.3km North east
Clogher Head (North east direction)	pNHA (001459)	11.3km North east
Barmeath Woods (North east direction)	pNHA (001801)	10km North east

No pNHA or NHA Sites are within close proximity of the proposed development site at Mell. The potential for air emissions giving rise to negative impacts upon the NHAs and pNHAs is considered low to negligible given the large separation distance to these sites. There are no nitrogen sensitive bogs within close proximity to the proposed site. There will be no direct or indirect impact upon any of these sites as a consequence of the proposed development.

Natura 2000 Sites (SAC/SPA)

The proposed development site is not located within a Natura 2000 site (i.e. SAC or SPA). This has been confirmed through consultation with:

- NPWS website
- EPA Appropriate Assessment Screening GeoTool
- SAC and SPA maps provided at www.biodiveristyireland.ie.

- Myplan.ie

The map presented as Figure 5-19 shows the existing site marked in relation to the zone of influence and shows the Natura 2000 sites screened. This information on Natura 2000 sites and their boundaries has been confirmed through consultation with the NPWS website and the SAC and SPA maps provided at www.biodiveristyireland.ie, www.epa.ie and www.myplan.ie.

Table 5-2 summarises the Stage 1 Appropriate Assessment Screening information and forms the Screening Findings with regards to Natura 2000 Sites.

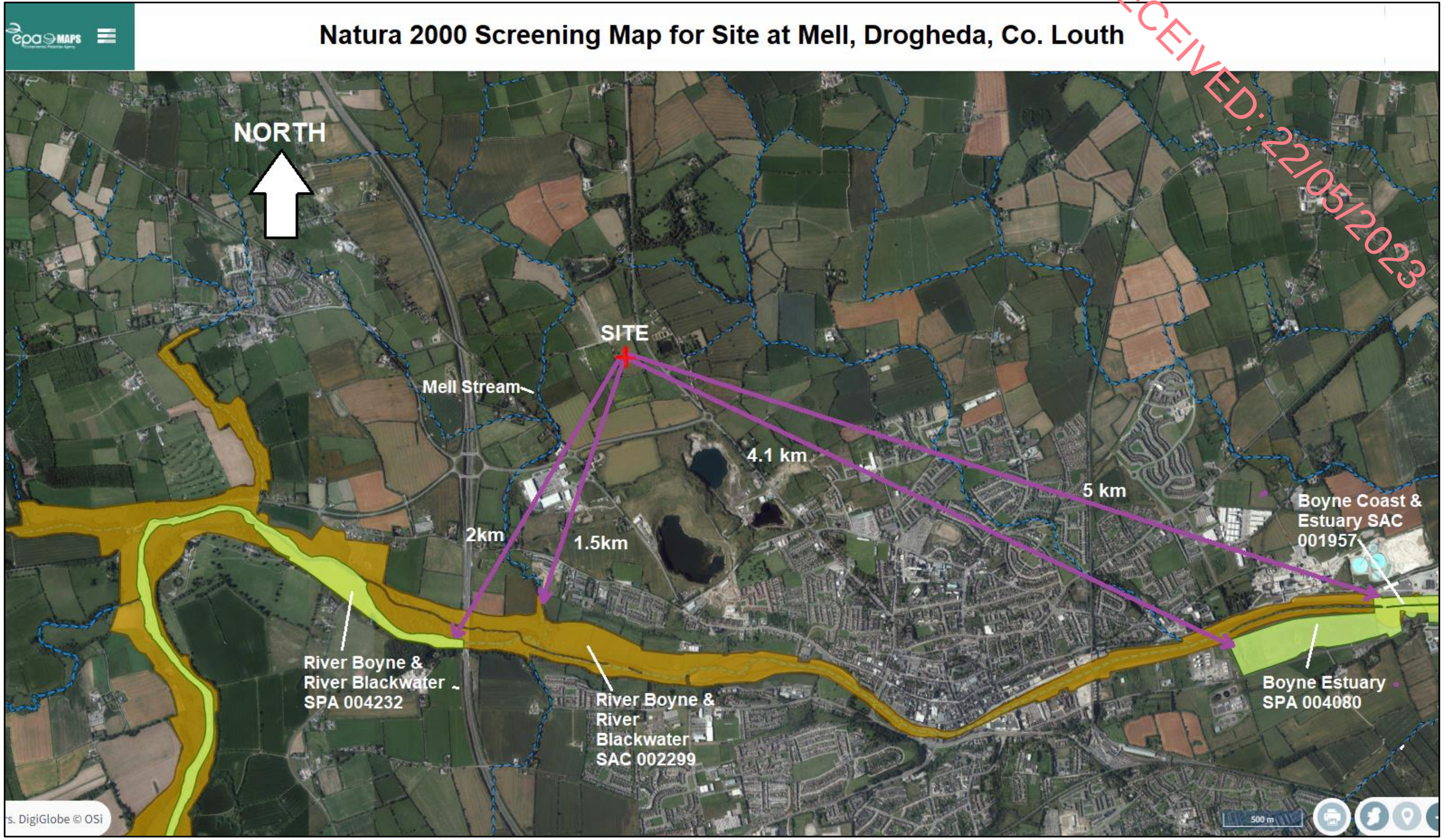

Figure 5-19 Natura 2000 Site Screening Map for the Proposed Development at Mell, Drogheda, Co. Louth (Source: EPA - AA Screening Tool)

Table 5-2 Natura 2000 Site Screened against Development Site at Mell

Site Type	Site Code	Site Name	Distance To (km)	Qualifying Interests (* denotes a priority habitat)	Assessment: Screen in/out/uncertainty
SAC	002299	River Boyne and River Blackwater SAC	1.5km	**Habitats** 7230 Alkaline fens 91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* **Species** 1106 Salmon *(Salmo salar)* 1355 Otter *(Lutra lutra)* 1099 River Lamprey *(Lampetra fluviatilis)*	**Screen In/Uncertainty** Site distance is significantly removed at over 1.5km. No qualifying interests are within the proposed development site. However, site drainage is hydrologically linked to the Mell Stream which flows south and does have hydrological connectivity with the River Boyne. There is therefore a potential hydrological pathway from the site to the River Boyne for potentially silt laden run-off water and pollutants such as hydrocarbons during construction and for pollutants during operation phase. Therefore, there is uncertainty as to the potential for significant impacts and therefore Screen In for further assessment and carry out a Stage 2 NIS.
SPA	004232	River Boyne and River Blackwater SPA	2km	**Birds** A229 Kingfisher *(Alcedo atthis)*	**Screen In/Uncertainty** Site is suitably removed from SPA at 2 km. No likelihood of any disturbance to kingfishers located over 2 km away. The development site does not form part of the nesting, feeding or breeding area for Kingfisher as listed as the qualifying interest. No habitats on site are listed as part of the qualifying interests of the SPA site However, site drainage is hydrologically linked to the Mell Stream which flows south and does have hydrological connectivity with the River Boyne. There is therefore a potential hydrological pathway from the site to the River Boyne for potentially silt laden run-off water and pollutants such as hydrocarbons during construction and for pollutants during operation phase. Therefore, there is uncertainty as to the potential for significant impacts and therefore Screen In for further assessment and carry out a Stage 2 NIS.
SPA	004080	Boyne Estuary SPA	4.1km	**Birds** A048 Shelduck *(Tadorna tadorna)* A140 Golden Plover *(Pluvialis apricaria)* A162 Redshank *(Tringa totanus)*	**Screen In/Uncertainty** Site is suitably removed from SPA at 4.1 km. No likelihood of any disturbance to birdlife located over 4.1 km away. The development site does not form part of the nesting, feeding or breeding area for Birds as listed as the qualifying interest. There are no Wetland habitats on the proposed site and therefore there are no habitats on site that are listed as part of the qualifying

Site Type	Site Code	Site Name	Distance To (km)	Qualifying Interests (* denotes a priority habitat)	Assessment: Screen in/out/uncertainty
				A144 Sanderling *(Calidris alba)* A143 Knot *(Calidris canutus)* A156 Black-tailed Godwit *(Limosa limosa)* A195 Little Tern *(Sterna albifrons)* A169 Turnstone *(Arenaria interpres)* A141 Grey Plover *(Pluvialis squatarola)* A142 Lapwing *(Vanellus vanellus)* A130 Oystercatcher *(Haematopus ostralegus)* **Habitats** Wetlands	interests of the SPA site However, site drainage is hydrologically linked to the Mell Stream which flows south and does have hydrological connectivity with the River Boyne. There is therefore a potential hydrological pathway from the site to the River Boyne for potentially silt laden run-off water and pollutants such as hydrocarbons during construction and for pollutants during operation phase. Therefore, there is uncertainty as to the potential for significant impacts and therefore Screen In for further assessment and carry out a Stage 2 NIS.
SAC	001957	Boyne Coast and Estuary SAC	5km	**Habitats** 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with Ammophila arenaria (white dunes)	**Screen In/Uncertainty** Site is suitably removed from SAC at 5 km and greater. No qualifying interests are within the proposed development site. However, site drainage is hydrologically linked to the Mell Stream which flows south and does have hydrological connectivity with the River Boyne. There is therefore a potential hydrological pathway from the site to the River Boyne for potentially silt laden run-off water and pollutants such as hydrocarbons during construction and for pollutants during operation phase which could damage estuarine habitats. Therefore, there is uncertainty as to the potential for significant impacts and therefore Screen In for further assessment and carry out a Stage 2 NIS.

Site Type	Site Code	Site Name	Distance To (km)	Qualifying Interests (* denotes a priority habitat)	Assessment: Screen in/out/uncertainty
				2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*	

It is acknowledged that whilst other Natura 2000 sites may be a further distance than 5km from the site, these are considered outside of the zone of influence and are screened out due to the large intervening distance, different and separate drainage catchments; no impact pathways; and the assessment that there will be no likely significant effects upon these sites. Divergence to assess these sites removes the focus on assessing any potential impacts upon the River Boyne & River Blackwater SAC, the River Boyne & River Blackwater SPA, the Boyne Estuary SPA and the Boyne Coast and Estuary SAC which are the closest Natura 2000 sites and are within the Source-Pathway-Receptor model due to potential indirect impacts associated with surface water drainage during the construction and operational phase of the development.

The development location consists of non- annexed habitat types – being dry meadows and grassy verges, recolonising bare ground, scrub, immature woodland, buildings and artificial surfaces, drainage ditch, hedgerows and treelines and is segregated from the River Boyne which is the nearest Natura 2000 site by a minimum of 1.5km. In the intervening distance there are fields, dwellings, commercial buildings, roads which all form artificial boundaries between the proposed site and the River Boyne.

The habitat types found within the site at Mell and in the immediate vicinity are non-priority habitats and none of the_habitats or species found within the proposed site boundary are worthy of specific conservation. The on-site habitats have no particular ecological conservation value and does not form the basis of designation of the River Boyne & River Blackwater SAC, the River Boyne & River Blackwater SPA, the Boyne Estuary SPA and the Boyne Coast and Estuary SAC and therefore does not form a part of theses Natura 2000 sites in terms of feeding grounds; species regeneration or nesting (i.e. otter or kingfisher).

Based on the location of the proposed site and that the proposed development site **is not** located within a Natura 2000 site (i.e. SAC or SPA) but is located over 1.5km from the closest Natura 2000 site - the River Boyne & River Blackwater SAC, the AA Screening Assessment concludes that the only potential pathways between the proposed development site and the Natura 2000 Sites is the possibility of indirect impacts from discharge of run-off surface waters containing silt or contaminants during the construction phase of the proposed development or pollutants during the operation phase which could reach the Natura 2000 sites, however unlikely that risk may be.

Therefore, having ascertained during the AA Screening that it is not possible to conclude, as a matter of scientific certainty that the proposed development will not have an effect on any Natura 2000 site, individually or together with other plans and projects, a NIS has been prepared as a precautionary measure to inform and assist the competent authority in carrying out the Appropriate Assessment.

The Site Synopses for the River Boyne & River Blackwater SAC, the River Boyne & River Blackwater SPA, the Boyne Estuary SPA and the Boyne Coast and Estuary SAC sites are provided in Appendix 6.

5.6 Impacts of the development

5.6.1 Construction stage

Direct impacts

None of the qualifying interests of the River Boyne and River Blackwater SAC or SPA, either habitats or species, occur within or directly adjacent to the proposed site. This has been determined during the habitat survey of the site and an assessment of the qualifying interests of the Natura 2000 sites.

The proposed development site consists of non- annexed habitat types – being dry meadows and grassy verges, recolonising bare ground, scrub, immature woodland, buildings and artificial Surfaces, drainage ditch, hedgerows and treelines and is segregated from the River Boyne which is the nearest Natura 2000 site by a minimum of 1.5km. In the intervening distance there are fields, dwellings, commercial buildings, roads which all form artificial boundaries between the proposed site and the River Boyne. The site is over 1.5 km away from the River Boyne SAC and does not border any main streams, rivers or coastal area associated with the Otter (*lutra lutra*) species.

The habitat types found within the site at Mell and in the immediate vicinity are non-priority habitats and none of the habitats or species found within the proposed site boundary are worthy of specific conservation with regards to the EU Habitats Directive. The on-site habitats have no particular ecological conservation value and do not form the basis of designation of the River Boyne & River Blackwater SAC, the River Boyne & River Blackwater SPA, the Boyne Estuary SPA and the Boyne Coast and Estuary SAC sites and therefore do not form a part of these Natura 2000 sites in terms of feeding grounds; species regeneration or nesting.

The site was all cleared in preparation for the development of the previously proposed Business Park in ca. 2008 – 2010. The site is zoned **General Employment** in the Louth County Development Plan 2021-2027. The site was entirely clear of vegetation save for the boundary hedgerows and treelines. In the north-east corner of the site there is a hardstanding concrete and tarmac area from this time.

Most of the young trees and saplings within the site, especially willow, ash, blackthorn and birch are only here due to lack of use of the site and the opportunities to naturally colonise the site through self-seed dispersion and the colonising nature of these species.

In the context of this site at Mell, Drogheda the scrub and immature Willow woodland is an indication of lack of use of the site and neglect in terms of land management. Whilst the immature woodland is quite extensive on site, it does not take many years for a site to revert back to this habitat type which in this case has been over a ca. 13 – 15 year period based on aerial photography. As part of the proposed development works during the construction phase it is proposed to clear this vegetation ready for setting out and site for construction works.

As the hedgerows are beneficial to wildlife and act as wildlife corridors for mammals and birds, they are remaining intact as part of the site development proposal as they also serve as screening and noise buffers and any security fencing will be emplaced inside the hedgerows as part of the construction works.

There are no pathways for direct impacts associated with the proposed development during the construction phase of the works. The land use within and adjacent to the development site, in addition to the separation distance of the proposed works areas from the River Boyne & River Blackwater SAC, the River Boyne & River Blackwater SPA, the Boyne Estuary SPA and the Boyne Coast and Estuary SAC sites would preclude any effects which may significantly impact on the conservation objectives for Kingfishers, River Lamprey, Salmon, Otters, Birdlife or Habitats associated with the Natura 2000 Sites, with respect to their conservation status.

The site clearance works have the potential to impact upon the bird nesting period and ideally should be timed appropriately to be outside of this period being the 1st of March to the 31st of August.

Indirect impacts

The hydrology of the site has been set out earlier in this report and whilst not distinct and clear in terms of hydrological connectivity, the River Boyne is located downstream of the application site (application site is ca. 1.5 km from the River Boyne and River Blackwater SAC). Hence the application site is located within the Boyne catchment (HA07) and there is likely to be connectivity with the Mell Stream which is a tributary of the River Boyne. The proposed development was screened in for NIS to assess any potential impacts upon the local hydrology which could connect to screen-in Natura 2000 sites.

There is an artificial drainage ditch within the northwest corner of the site which does not appear to have any flow and is stagnant is not evaluated as having any fisheries value, due to the seasonal flow regime and distance from any main streams as shown on the EPA Hydrology maps. It is proposed as part of the development works to close off this ditch and backfill the trench as it will not be necessary.

There is potential for significant indirect effects on the River Boyne and River Blackwater SAC and SPA sites arising from the construction and operational phases of the development of the Galvanising Facility. Specifically, the proposed development has the potential to result in water quality impacts including pollution and siltation/sedimentation run-off during construction and built phase of the proposed project before any mitigation measures are considered.

Negative changes in water quality could have an indirect impact upon aquatic invertebrates and fish populations. This in turn could indirectly impact upon fish such as the River Lamprey and Salmon species and could by association impact upon Otters, Kingfishers and Birdlife.

The proposed works have the potential to give rise to indirect water quality impacts during the construction phase due to surface water run-off leading to potential diffuse discharge of pollutants or suspended solids.

(a) Contamination of surface waters with particulate matter from disturbance of soil and subsoil at the site. The effect of this is considered to be adverse, slight (as a function of being a temporary (1-7 years) impact on an attribute of High importance), potentially affecting 1 km of downstream bed substrate, but unlikely providing adequate mitigation measures are implemented.
(b) Contamination of surface waters with hydrocarbons resulting from mobile refuelling of plant and machinery. The effect of this is considered to be adverse, slight (as a function of being a short-term impact (1-7 years) on an attribute of High importance), potentially affecting 1 km of downstream bed habitat, but unlikely providing adequate mitigation measures are implemented.
(c) Contamination of surface waters with cementitious materials from the installation of concrete foundations, concrete hardstanding and sub-surface concrete drainage infrastructure. The

effect of this is considered to be adverse, slight (as a function of being a temporary impact (1-7 years) on an attribute of High importance), potentially affecting 1 km of downstream bed habitat, but unlikely providing adequate mitigation measures are implemented.

The potential impacts with reference to water quality during the construction phase may arise due to connectivity to the minor artificial drain to the northwest of the site and watercourses in the vicinity of the development site. This gives rise to pathways for surface water /storm water run-off with downstream connectivity to the River Boyne via the Mell Stream. There is the potential for adverse effects in the absence of appropriate mitigation measures.

5.6.2 Operational stage

Direct impacts

The potential for air emissions giving rise to negative impacts upon the Natura 2000 sites screened is considered low to negligible given the large separation distance of over 1.5 km and that the species listed in the qualifying interests for the Natura 2000 sites are not known to be particularly sensitive to air emissions. There are no nitrogen sensitive bogs within close proximity to the proposed site.

During the operational phase, the indirect impacts affecting the qualifying interests of the four Natura 2000 sites screened in are limited to potential water quality effects extending downstream within the River Boyne.

Indirect impacts

The principal pollution threats from the operational phase are from:

(a) Management, collection and discharge of clean stormwater to any receiving watercourse.
(b) Increase in flood risk to local watercourses due to increase in hardstanding/roofs
(c) Fuel/Hydrocarbon spillages during the operational phase resulting from washdown and/or surface water runoff within external storage areas that can migrate to the on-site drainage network and downstream receiving waters
(d) Chemical storage leaks or contamination. However, all galvanising activities involving potentially harmful chemicals will take place indoors
(e) Emergencies and emergency procedures such as a fire.

These could all result in a potential for deterioration of water quality within the River Boyne & River Blackwater SAC, the River Boyne & River Blackwater SPA, the Boyne Estuary SPA and the Boyne Coast and Estuary SAC sites in the absence of appropriate mitigation measures.

5.6.3 Unplanned events

Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports indicates that EIARs should address unplanned effects as relevant (examples include accidents, spills, floods and fires). Directive 2014/52/EU further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned. The Directive gives examples of 'flooding, sea level rise, or earthquakes'.

Direct impacts

There are no likely significant direct impacts upon biodiversity from the operational stage of the development. From a thorough inspection of the site, the proposed works are not located within a potential flood risk area and the risk of coastal flooding on this site is not a possibility. There is no risk of any other type of pluvial or fluvial flooding and therefore there is no risk of surface water run-off, soiled water discharges, hydrocarbon/fuels or indiscriminate discharges from the site.

Indirect impacts

The proposed development could pose a risk to surface waters in the event of an emergency such as a fire or explosion. This could then potentially impact upon the biodiversity of aquatic habitats and associated flora and fauna by contaminated drainage waters.

5.6.4 Cumulative impacts

Effects arising in respect of existing developments are considered within the assessment of the receiving environment, and as such are considered cumulatively with the effects of the proposed development as set out in this Chapter.

In accordance with EIA legislation and Table 3.5 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (see also Section 1.9), a search was undertaken for approved developments, but not yet built or operational, of relevance to the consideration of cumulative effects in respect of Biodiversity and none were identified.

5.6.5 'Do-nothing' impacts

In the 'Do-Nothing' scenario, the proposed site will continue to evolve with natural succession being prevalent and turning the habitats on site from grassland to scrub to immature woodland. The woodland would continue to mature with larger trees becoming more dominant, with lesser understorey plants prevalent.

5.7 Mitigation measures

The following is a Method Statement of proposed works incorporating mitigation and precautionary measures to mitigate against any potential impacts upon biodiversity and local water quality.

5.7.1 Construction Phase Mitigation Measures

The following is a Method Statement to be adopted during construction works:

Timing of Site Clearance Works and Tree Felling/Scrub Removal

Ideally all tree felling and scrub clearance shall be avoided during the bird nesting period of 1st of March to the 31st of August. This is to protect nesting birds and their young. All existing hedgerows and treelines around the site shall be maintained and enhanced to protect their local biodiversity value.

Management of Soil & Excavations and Siltation

A "silt fence" is to be installed along the southern site boundary and also along the northwestern drainage ditch to mimic the potential surface water drainage from the site. This is to prevent silting or contaminated run-off from leaving the site towards any surface water ditch. The "silt fence" is to remain in place for the duration of the works – see Figure 5-20 and Figure 5-21.

Excavations at the site shall be clearly defined and restricted to the stated areas. Excavated overburden will remain exposed for as little time as possible.

Topsoil stripping will be restricted to the minimum area required for efficient earthworks operation.

Working contours will ensure no surface waters leave site in an uncontrolled manner.

Any stockpiles shall be covered and located over 15 m from drainage channels.

Any stormwater leaving the construction area shall pass through a temporary settlement pond before entering the local surface water network.

Maintain a vegetated margin of at least 10 m around the working area where possible.

It is expected that there will be no export of soils off-site. Soils not suitable for use as fill within the site will be used for non-structural landscaping purposes. Top-soil will be stored on-site in sealed piles not exceeding 2m in height to be re-used later for landscaping. Sub-soil will be stored in stockpiles not exceeding 2 m prior to re-using as backfill. This should be stabilised and seeded as soon as practical to reduce any potential for saturation of soil and risk of silting.

The suitability of the soil conditions will be assessed on site by the Engineer and advice given as to the best course of action in terms of foundation construction.

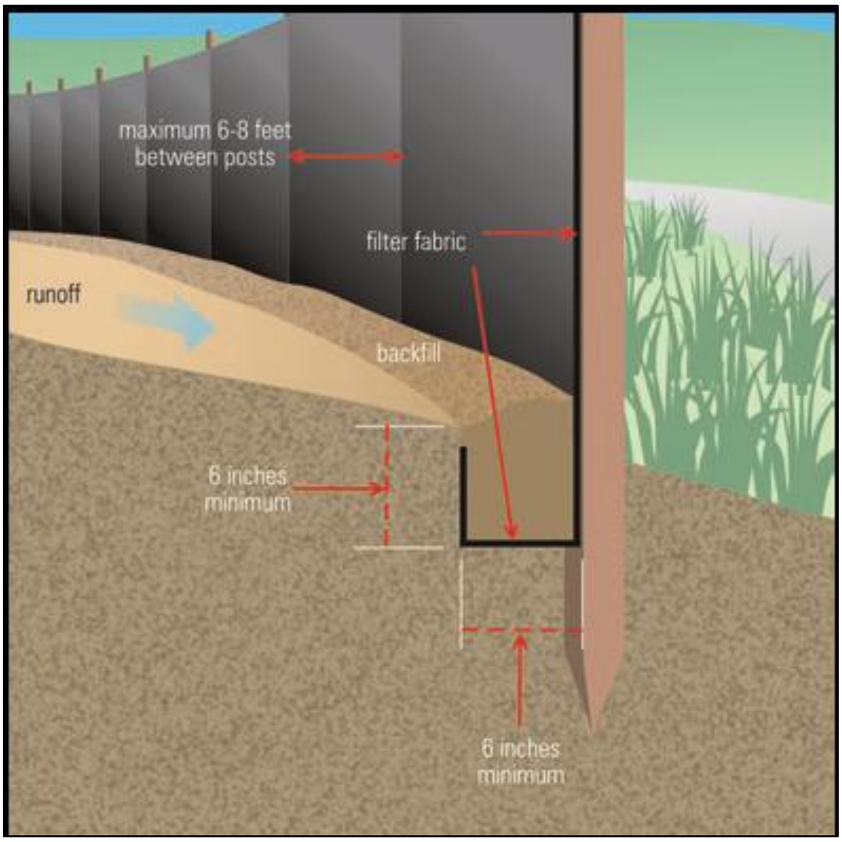

Figure 5-20 Example of EPA approved silt fence detail – temporary fence used during site works / construction phase.

Figure 5-21 Example of silt fence in operation on similar sites

Storage of Hydrocarbons; Leakages from Machinery; Spillages during Refuelling

All potentially contaminating substances to be stored in designated areas away from excavation areas, isolated from gullies, open channels or exposed overburden.

Potentially contaminating substances will be stored in designated areas that are isolated from surface water drains or open waters. Hazardous wastes such as waste oil, chemicals and preservatives will be stored in designated, sealed containers. Fuelling, lubrication and storage areas will be in a designated area away from excavation works and not within 30 m of drainage ditches or surface waters.

All fuel and waste containers shall be stored within a secondary containment system (e.g. a bund for static tanks or a drip tray for mobile stores and drums). The bunds will be capable of storing 110% of tank capacity, plus a minimum 30 mm rainwater allowance where the bund is uncovered.

Where more than one tank is stored, the bund must be capable of holding 110% of the largest tank or 25% above the aggregate capacity. Drip trays used for drum storage must be capable of holding at least 25% of the drum capacity.

Regular monitoring of water levels within drip trays and bunds due to rainfall will be undertaken to ensure sufficient capacity is maintained at all times.

An adequate supply of spill kits and hydrocarbon absorbent packs shall be stored on site and must be utilised if leakages or minor spillages are observed.

Uncontrolled spillage of cementitious material

All ready-mixed concrete shall be delivered to site by truck. A suitable risk assessment for wet concreting shall be completed prior to works being carried out.

Washdown and washout of concrete trucks, with the exception of the chute, will take place at an appropriate facility off-site.

There will be no hosing into surface drains or gullies of spills of concrete, cement, grout or similar materials. Such spills shall be contained immediately and runoff prevented from entering the drainage network.

Given the significant amount of concrete to be laid on site, if the concrete contractor insists that trucks are washed out on site, then washings from such shall pass through a temporary settlement tank with pH correction. Concrete shall only be poured in pre-determined target locations.

5.7.2 Operational Phase Mitigation Measures

Increase in flood risk to local watercourses due to increase in Hardstanding/roofs

From a thorough inspection of the site, the proposed works are not located within a potential flood risk area and the risk of coastal flooding on this site is not a possibility. There is no risk of any other type of pluvial or fluvial flooding and therefore there is no risk of surface water run-off, soiled water discharges, hydrocarbon/fuels or indiscriminate discharges from the site.

Rainfall-runoff generated on the new car parking area, truck parking area and internal access road shall be disposed of to ground via a new infiltration area and permeable paving.

A new subsurface attenuation tank shall be installed to withhold runoff generated on main building and concrete apron during rainfall events. The attenuation tank shall be fitted with a hydrobrake to restrict release of stormwater to greenfield runoff rates. These Sustainable Urban Drainage Systems (SuDS) shall be implemented to control all runoff leaving the site at greenfield runoff rates. Hence the proposed activities will not increase flood risk elsewhere.

Increase in silt load to watercourses

Two new hydrocarbon interceptors are proposed to treat rainfall-runoff generated on hardstanding areas. The interceptors are capable of collecting silt mobilised in rainfall-runoff. Gullies and catchpit manholes within the stormwater network will also serve to limit silt run-off from the site.

Potential for hydrocarbons or Chemicals to migrate to watercourses from Spillages or Leaks

This section considers hydrocarbon contamination from machinery, trucks and cars.

Two new hydrocarbon interceptors are proposed to treat stormwater. These will outfall to the new infiltration area and the southern boundary drain.

There will be a concrete floor in the internal area in the building and a concrete apron will be provided around the building. All chemicals used in the galvanising process shall be stored and used within the main building.

All potentially contaminating substances to be stored in designated areas away from excavation areas, isolated from gullies, open channels or exposed overburden.

Hazardous wastes such as waste oil will be stored in sealed containers and labelled appropriately.

Fuels/chemicals will be stored within the building in suitable containers and bunded as required.

Diesel for forklift trucks shall be stored outside in appropriately bunded tanks.

LPG used for heating will be stored outdoors in suitable tanks.

Refuelling, lubrication and storage areas will be in a designated area, not within 30 m of surface waters.

All fuel and waste containers will be stored within a secondary containment system (e.g. a bund for static tanks or a drip tray for mobile stores and drums). The bunds shall be capable of storing 110% of tank capacity, plus a minimum 30 mm rainwater allowance where the bund is uncovered.

Where more than one tank is stored, the bund must be capable of holding 110% of the largest tank or 25% above the aggregate capacity. Drip trays used for drum storage must be capable of holding at least 25% of the drum capacity.

Regular monitoring of water levels within drip trays and bunds due to rainfall will be undertaken to ensure sufficient capacity is maintained at all times.

An adequate supply of spill kits and hydrocarbon absorbent packs shall be stored on site and must be utilised if leakages or minor spillages are observed.

Potential for contaminants to migrate to watercourses via stormwater network from washdown water

No on-site treatment or discharge of wastewater effluents is proposed on-site. Foul drainage (i.e. effluent from toilets, staff facilities etc. will be directed to the main sewer. Supporting infrastructure is to be provided by the IDA / IDA in conjunction with other bodies as applicable as part of the IDA's infrastructure enhancement project to support the development of the wider IDA lands at this location.

Regular inspections to ensure integrity of hardstanding is not compromised. If any cracks or defections are observed then comprised area to be reinstated immediately.

The newly proposed interceptors include appropriate capacity for silt entrapment. The main building isolates galvanising processes and potentially harmful substances from rainwater.

Emergencies such as Fire and uncontrolled release of firefighting water

Both the northern interceptor and the southern attenuation device shall be fitted with a shutoff valve. In the event of a fire the shutoff valves will be closed immediately. Used firefighting water generated shall be contained within the attenuation tank and retaining wall structure at the southern end of the site.

It will be necessary to undertake follow-up surface water monitoring, to include a full suite of chemical and biological sampling.

All personnel working on the site shall be trained in the implementation of fire and emergency procedures.

During the construction and operational phases hydrocarbon and silt interceptors will be serviced and maintained on a regular basis by an independent licensed contractor. Regular inspections of the site infrastructure (hardstanding, drainage infrastructure, etc.) shall also be undertaken by a designated person.

5.8 Monitoring measures

Bi-annual monitoring of discharges to surface water is recommended.

Parameters shall be agreed with the local authority. Designated sampling points shall be agreed with the local authority.

All personnel working on the site shall be trained in the implementation of fire and emergency procedures.

During the construction and operational phases hydrocarbon and silt interceptors will be serviced and maintained on a regular basis by an independent licensed contractor. Regular inspections of the site infrastructure (hardstanding, drainage infrastructure, etc.) shall also be undertaken by a designated person.

5.9 Residual impacts

Residual impacts refer to the degree of environmental change that will occur after the proposed mitigation measures have taken effect.

The construction phase will involve clearance of the scrub and immature woodland on-site. During the operational phase there will be no direct interaction with biodiversity apart from maintenance of hedgerows and treelines and landscaping works.

Assuming implementation of the mitigation measures described above the residual impacts on the biodiversity during the construction and operational phases are assessed as being negligible. In relation to Natura 2000 sites, the Natura Impact Statement concluded as follows:

The NIS conclusions are that the Application for planning permission for *"Proposed Galvanising Facility at Mell, Drogheda, Co. Louth."* will:

1. Have no significant impact upon surface water quality either during the construction phase or the operational phase. The proposed development will not cause deterioration of water quality, which would have a negative impact upon the Natura 2000 sites screened, namely the River Boyne & River Blackwater SAC, the River Boyne & River Blackwater SPA, the Boyne Estuary SPA and the Boyne Coast and Estuary SAC sites. This is confirmed through the precautionary and mitigation measures incorporated into the Method Statement for the construction and operational phases of the development.

2. There will no loss of any Natura 2000 site area. There will be no loss or fragmentation of Annex I habitats; or Annex II species upon which any Natura 2000 site qualifies for its conservation status as a consequence of permitting the proposed development to proceed. This is due to the nature and scale of the proposed development and the separation distance of the actual site works from Natura 2000 sites of over 1.5km from the River Boyne & River Blackwater SAC (Site Code 002299), 2 km from the River Boyne & River Blackwater SPA (Site Code 004232), 4.1 km from the Boyne Estuary SPA and 5 km from the Boyne Coast and Estuary SAC sites.

3. There will be no cumulative impact upon any Natura 2000 sites in combination with other plans or projects.

4. The proposed development will not compromise the maintenance of Annex I habitats for which any Natura 2000 site has been selected at favourable conservation status through the incorporation of appropriate mitigation measures which will suitably prevent any adverse impact on the integrity of the Natura 2000 network.

5. It is concluded that the conservation objectives of the River Boyne & River Blackwater SAC, the River Boyne & River Blackwater SPA, the Boyne Estuary SPA and the Boyne Coast and Estuary SAC sites will be met as the habitats and species will be maintained at a favourable conservation status. The NIS findings and conclusions remove all reasonable scientific doubt as to the effects that the works proposed may have on the Natura 2000 sites.

5.10 Interactions with other impacts

The EIAR guidelines (EPA, 2022; DHPLG, 2018) highlight that the interaction of impacts upon biodiversity arising from proposed activities, must be given due consideration alongside potential receptors identified in other EIAR sections. Due consideration has been made with regards to the potential for surface water impacts from siltation or pollutants to impact upon biodiversity. Also, consideration has been made with regards to biodiversity and soils, human beings and climate and landscape in terms of hedgerow retention and landscaping works. Having considered this, it is not anticipated that the effects of the proposed development on biodiversity will interact significantly with other potential impacts.

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www.wildflowersireland.ie

6 CULTURAL HERITAGE

6.1 Introduction

6.1.1 Author

The assessment was prepared by Dr. Charles Mount who is a member of the Institute of Archaeologists of Ireland and a member of the Discovery Programme and has more than thirty years of cultural heritage assessment experience. He holds M.A. and Ph.D. degrees in archaeology as well as a professional diploma in EIA and SEA Management.

6.1.2 Objectives/purpose/scope of report

This Chapter of the Environmental Impact Assessment Report (EIAR), commissioned by Boylan Consulting on behalf of Hibernia Steel (Manufacturing) Limited, addresses the impacts on the archaeological, architectural, and cultural heritage of the application site and the surrounding area, of a proposal to develop a hot dip galvanising facility at Mell, Drogheda, County Louth. The development will consist of:

- Construction of a main building with an approximate gross floor area of 5719m^2. The building contains
  - (i) 'black material' (unprocessed material) jigging area (in-take area)
  - (ii) Pre-treatment area
  - (iii) Galvanising (treatment) area
  - (iv) Galvanised material unjigging area (out-take area)
  - (v) Services area
  - (vi) Staff welfare facilities (2 storey over basement)
- Construction of 2 No. stacks to extract flue gases from the main and stand-by furnaces respectively. These will be located on the roof at a height of 20 m above finished floor level.
- Construction of 1 No. stack to extract white fumes from the zinc kettle. Exhaust air will be filtered through bag filters prior to discharge to air at 20 m above finished floor level.
- Construction of 1. No. stack to extract exhaust air from the pre-treatment area. Acid vapours produced in the pre-treatment area are passed through a scrubber prior to discharge to air. This stack will be located at 20 m above finished floor level.
- Construction of ESB sub-station.
- Installation of gas storage tanks
- Installation of double weighbridge.

- Construction of main offices (2 storeys) with an approximate gross floor area of 298m^2.
- Provision of trailer and truck parking spaces.
- Provision of 110 visitor and staff parking areas, 2 of which are wheelchair accessible and 7 of which are EV charging locations.
- Provision of 20 No. staff and visitor bicycle parking.
- Provision of concrete yard and additional hardcore yard.
- Installation of stormwater management system.
- Installation of 2 No. rainwater harvesting tanks
- Construction of soil berm.
- Landscaping works
- Firewater retention infrastructure
- Provision of vehicular and pedestrian entrance to the facility, site security fencing and entrance walls and gates.

A copy of the site layout is provided in Figure 6-1.

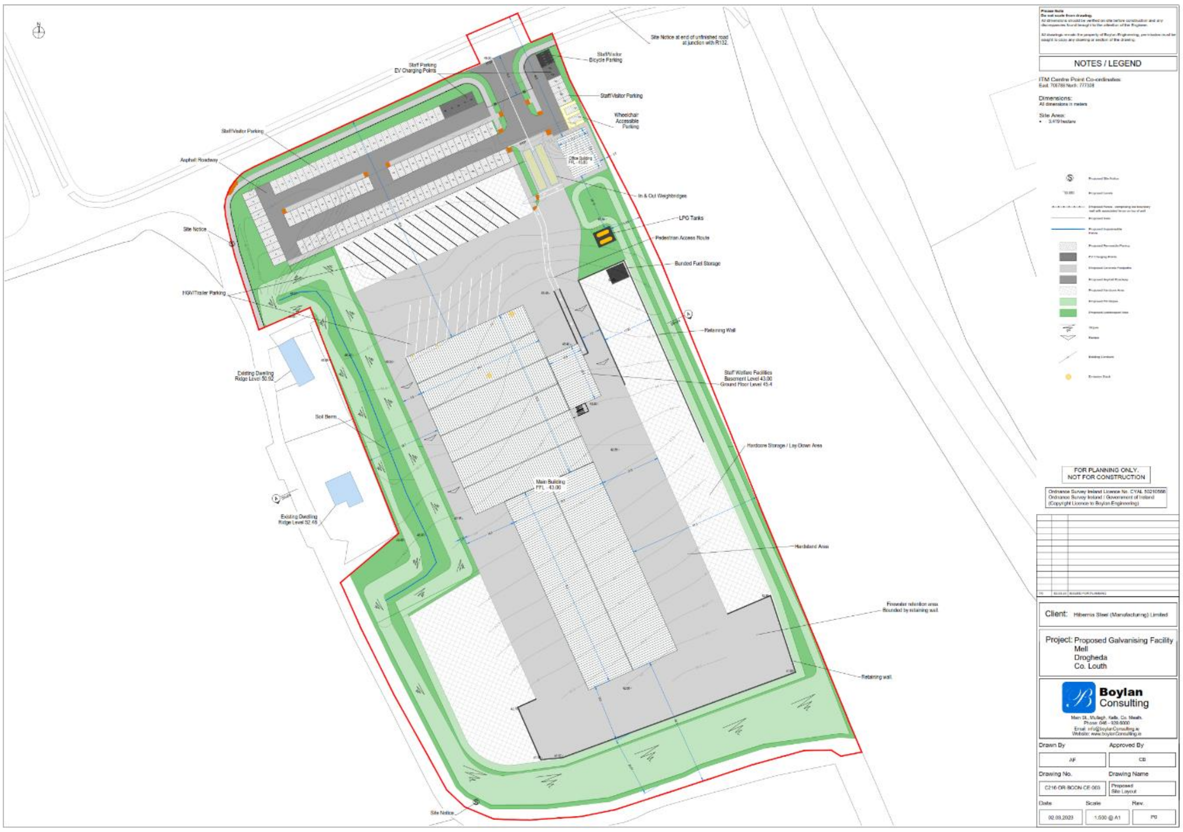

Figure 6-1 The proposed development galvanising plant layout.

6.2 Methodology

6.2.1 Guidelines

The report format and some of the descriptions of effects are based on the Guidelines on the Information to be contained in Environmental Impact Assessment Reports, published by the Environmental Protection Agency (EPA) in May 2022.

6.2.2 Study Area

The overall study area extends 1km from the application area in all directions and is shown in Figure 6-2.

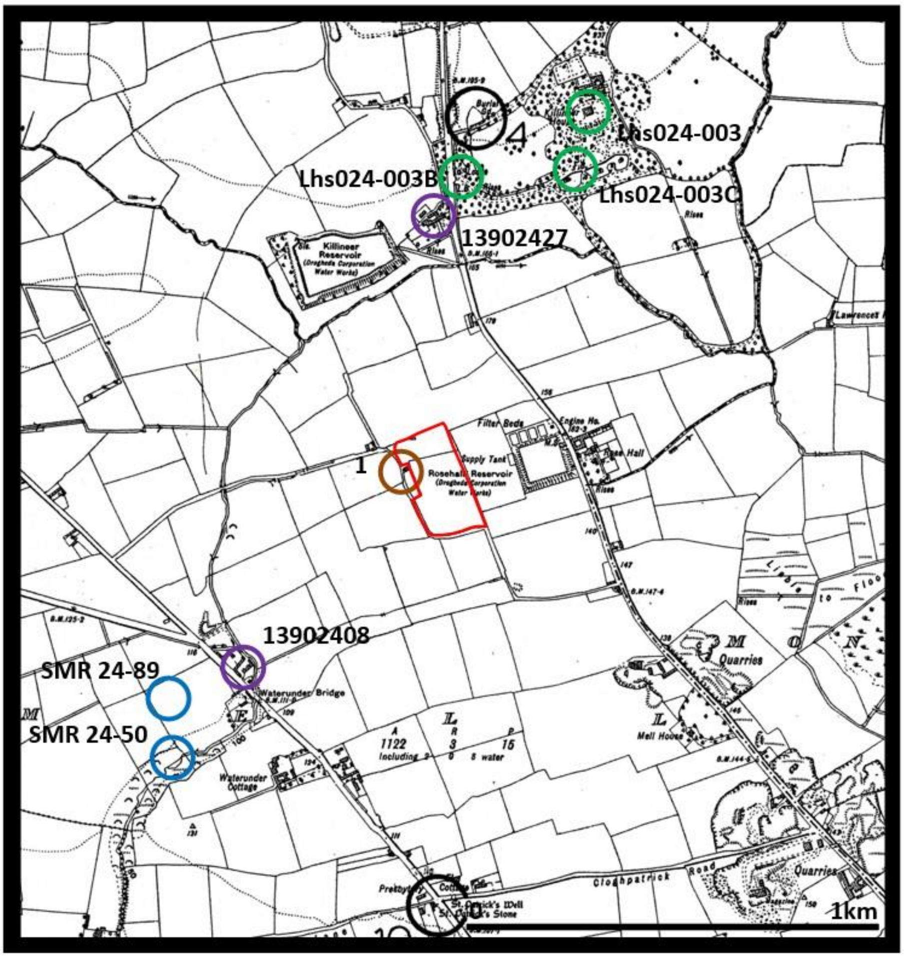

Figure 6-2 The study area superimposed on the Sites and Monuments Record. The application site is indicated by the red line. RMP sites are indicated with black circles and SMRs with blue circles. Protected Structures with green circles, structures in the NIAH with purple circles and other structures with brown circles.

6.2.3 Scope of Work / methodology

This study which complies with the requirements of Directive EIA 2014/52/EU is an assessment of the known or potential cultural heritage resource within a specified area and includes the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment. It consists of a collation of existing written and graphic information in order to identify the likely context, character, significance and sensitivity of the known or potential cultural heritage, archaeological and structural resource using an appropriate methodology (EPA 2002, 2003 and 2022).

The study involved detailed investigation of the archaeological and historical background of the development site, the landholding and the surrounding area extending 1km from the development boundary (Figure 6-2). This area was examined using information from the Record of Monuments and Places of County Louth, the Louth County Development Plan, lists of excavations and cartographic and documentary sources. A field inspection was carried out on the 15th of November 2022 to identify and assess any known archaeological sites and previously unrecorded features and portable finds within the application site.

An impact assessment and mitigation strategy have been prepared. An impact assessment is undertaken to outline potential adverse impacts that the proposed development may have on the cultural resource, while a mitigation strategy is designed to avoid, reduce or offset such adverse impacts.

The application site is located in the townland of Mell, Co. Louth, on OS Six Inch sheet No. 24, approximately 2.5 km north-west of the town of Drogheda, and just to the west of the R132 road. The application site consists of approximately 3.4 Ha of unused, overgrown land.

Extracts from the Record of Monuments and Places (RMP) for Co. Louth are presented on a map of the local area around the site in Figure 6-2 The study area superimposed on the Sites and Monuments Record. The application site is indicated by the red line. RMP sites are indicated with black circles and SMRs with blue circles. Protected Structures with green circles, structures in the NIAH with purple circles and other structures with brown circles.. RMP sites included on the Records of Monuments and Places statutory mapping are identified by black circles. The application area is shown in red.

6.2.4 Baseline Study methodology

Research has been undertaken in two phases. The first phase comprised a paper survey of all available archaeological, historical and cartographic sources. The second phase involved a field inspection and assessment of the proposed development area.

Paper Study

This is a document search. The following sources were examined and a list of sites and areas of archaeological potential compiled:

1. The Louth County Development Plan 2021-2027
2. The National Inventory of Architectural Heritage
3. The Record of Monuments and Places
4. The Sites and Monuments Record
5. Available aerial photography
6. Cartographic and written sources relating to the study area.

The County Development Plan

This notes structures listed for preservation.

The National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) which is maintained by the Dept. of Housing, Local Government and Heritage lists significant heritage structures.

The Record of Monuments and Places

This was established under section 12 (1) of the 1994 National Monuments (Amendment) Act and provides that the Minister shall establish and maintain a record of monuments and places where the Minister believes there are monuments, such record to be comprised of a list of monuments and relevant places and a map or maps showing each monument and relevant place in respect of each county in the State. The associated files contain information of documentary sources and field inspections where these have taken place. All available information on these sites is provided in Appendix 7.

The Sites and Monuments Record (SMR)

The Sites and Monuments Record (SMR) which is maintained by the Dept. Housing, Local Government and Heritage is a record of monuments that are listed in the Record of Monuments with additional sites and monuments not listed in the record and the locations of monuments that have been removed.

Aerial Photography

Aerial photography has the potential to record cropmark, soil mark and other monuments not previously recorded.

Cartographic Sources

This included seventeenth century mapping as well the 1st and 2nd editions of the Ordnance Survey six-inch maps.

Documentary sources

These provide more general historical and archaeological background.

6.2.5 Field Inspection

A field inspection was carried out to determine the location, extent and ascertain the significance of any archaeological sites and to identify any previously unrecorded or suspected sites and portable finds.

6.2.6 Criteria for describing impacts

The criteria for describing impacts is based on the terminology used in the EPA 2022 Guidelines on The Information to be Contained in Environmental Impact Assessment Reports Figure 6-3.

Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative or neutral	**Positive Effects** A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Describing the Significance of Effects "Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see *Determining Significance* below.).	**Imperceptible** An effect capable of measurement but without significant consequences.
	Not significant An effect which causes noticeable[2] changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	**Extent** Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision.	**Likely Effects** The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	**Momentary Effects** Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day
	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years
	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

Describing the Types of Effects	**Indirect Effects (a.k.a. Secondary Effects)** Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do-Nothing Effects' The environment as it would be in the future should the subject project not be carried out.
	`Worst case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

Figure 6-3 Reproduction of Table 3.4 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, which provides guidance on descriptions of effects

6.3 Characteristics of the development

The proposed development will consist of a hot-dip galvanising facility with zinc kettle at Mell, Drogheda, Co. Louth. It is planned to process up to 36,000TPA of steel at the plant in an area of approximately 3.4 Ha.

Site infrastructure includes:

A main building

The main building has a gross floor area of 5719m^2 and is divided into three main sections

- In-take/out-take section at the southern end of the building. This is single storey and has a maximum height above finished ground level of 14.55m.

- Processing & services area at the northern end of the building. This is also single storey with maximum height above finished ground level of 17.30m. The processing area is the area where the steel is pre-treated and galvanised. The services area is where the chemicals are stored, mixed and distributed from. It also contains air abatement infrastructure (acid vapour scrubber & white fumes bag filters) and control panels.
- Welfare facilities, located at northeastern corner.

The proposed building heights are for operational reasons and to accommodate required equipment.

All built structures will be finished in dark / muted colours.

There will be four stacks on the roof, all 20m above finished floor level. There is also an emission point at 7.5m above ground level from the cooling tower.

Parking

Parking facilities for staff and visitors is provided in the northern part of the site. Disabled parking, EV charging points and bicycle parking will be provided. Truck parking facilities will also be provided. Adequate truck parking will be provided for the proposed plant throughput.

Weighbridges

A double weighbridge will be provided close to the site entrance.

Site Entrance

The entrance to the proposed development is from the access road linking Chapel Lane to the R132 along the north western boundary. This access road is currently closed and in a part-built state. The access road and its junction with the R132 road will be completed as part of IDA Ireland's plans for the wider lands at this location, and these works do not comprise part of the subject application proposals. Pedestrian access will also be provided.

Site offices

The office for the operational phase will be provided beside the entrance.

Surfaces used in the yard

Hardstanding around the main building consists of an inner area of concrete and an outer gravelled area. The car park is surfaced with asphalt roadways and permeable hardstanding parking spaces.

Storm water management

Storm water from the site will be managed through infiltration and by attenuated discharge to local water course.

Services available

In respect of mains water and foul water, supporting infrastructure is to be provided by the IDA / IDA in conjunction with other bodies as applicable as part of the IDA's infrastructure enhancement project to support the development of the wider IDA lands at this location (see Section 2.3.5). An existing electricity transmission line currently traverses the application site. Gas supply for the proposed development will be via on-site storage tanks.

6.4 Receiving environment

6.4.1 The Landscape

The application site is located in the townland of Mell, Co. Louth, on OS Six Inch sheet No. 24, approximately 2.5 km north-west of the town of Drogheda, and just to the west of the R132 road. The application site consists of approximately 3.4 Ha of unused, overgrown land. The soil is generally a Fine loamy drift with siliceous stones overlying drift with siliceous (http://gis.teagasc.ie/soils/map.php).

6.4.2 Historical and Archaeological Background

The following is a brief summation of the main types of sites and monuments that are known along with the historical development of the study area. It is intended to place the monuments in the study area in context. The application area is situated in the townland of Mell, in the Barony of Ferrard, and the civil parish of Tullyallen.

The Prehistoric Period

Prehistoric archaeology in the study area consists of Neolithic, Beaker period and Late Bronze Age domestic activity, Iron Age enclosure and ditches with post-holes and bowl furnaces and kilns, *burnt mounds,* enclosures, *ring-ditches and* several fulachta fia identified in archaeological excavations in Mell townland (see Archaeological Investigations in the Study Area section below).

The Early Medieval Period

In the early medieval period the study area formed part of the Trícha (local kingdom) of Fir Arda Ciannachta which was ruled by the Ciannachta Breg and there are a dozen kings recorded between the seventh and tenth centuries (MacCotter 2008, 236). Classically settlement at this period is indicated by the presence of enclosed farmsteads known as ringforts, when enclosed with earthen banks, and cashels when enclosed by stone walls. There is a ringfort known from the study area in Mell townland (RMP SMR LH024-089----), as well as a souterrain (excavation licence no. 00E0631*)* and an early medieval cemetery (excavation licence no. *00E0430)* in Mell townland that indicate early medieval settlement.

The Later Medieval Period

In the later medieval period Mell was part of the lands of the Cistercian monastery of Mellifont, which was founded by St. Malachy O Morgair in 1142 (Gwynn and Hadcock 1970, 139). In 1178 King Henry II confirmed the grant of the grange of Melle (which include the application site) to the Monks of Mellifont (Sweetman 1875, No. 50). Mell remained part of the monastery of Mellifont until the suppression of the Abbey in 1539. The extent of the Abbey records Melle as consisting of 2 messuages (Houses), 80 acres arable and 20 acres pasture. It was held by Patrick Tankarde and Nicholas Connyll and leased to Patrick Wale.

The Post Medieval Period

Soon after the dissolution Mellifont came into the hands of Edward Moore of Mellifont. In 1641 Mell was recorded as held by Lord Viscount Charles Moore of Drogheda and Henry Moore, 1st earl of Drogheda held it in 1670 (http://downsurvey.tcd.ie/). Griffiths Primary Valuation of 1847-64 records that the application site was mostly held by Henry S. Singleton, and leased to Patrick Drew, John McGrane, and Francis Berrill (http://griffiths.askaboutireland.ie/).

6.4.3 Buildings

Protected Structures

The Louth County Development Plan 2021-27 containing the Record of Protected Structures was examined as part of the baseline study for this chapter of the EIAR. The review established that there are no Protected Structures situated within the application site. There are three Protected structures listed within the study area (see Table 6-1).

The closest Protected Structure to the proposed development is the Gate Lodge RPS Lhs024-003B in Killineer townland. This structure is located c. 0.64km to the north of the application site and will not be directly or indirectly impacted by the proposal. The remaining Protected Structures in the study area are considered to be too far distant from the application site to be directly or indirectly impacted by the proposal.

Table 6-1 Protected Structures in the study area

No.	**Lhs024-003**
Structure type	House
Townland	Killineer
Designation	Record of Protected Structures
Data source	Co. Louth Record of Protected Structures
Perceived Significance:	Regional
Type of impact:	None
Significance & quality of impact	None
Description	1835, early Italianate house. Detached six-bay two-storey with projecting single-storey Doric porch and three-bay side elevations.
Mitigation proposal	No mitigation required
Photos:	-
No.	**Lhs024-003**B
Structure type	Gate Lodge
Townland	Killineer
Designation	Record of Protected Structures
Data source	Co. Louth Record of Protected Structures
Perceived Significance:	Regional
Type of impact:	None
Significance & quality of impact	None
Description	Detached three-bay single-storey gate lodge, built 1836. Engaged Doric portico to south, fully-engaged extension c. 1870 and lean-to extension to north.
Mitigation proposal	No mitigation required
Photos:	-
No.	**Lhs024-003**C
Structure type	Summer House
Townland	Killineer
Designation	Record of Protected Structures

Data source	Co. Louth Record of Protected Structures
Perceived Significance:	Regional
Type of impact:	None
Significance & quality of impact	None
Description	Detached two-bay single-storey summer house, built c. 1850.
Mitigation proposal	No mitigation required
Photos:	-

Structures in the National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) which is maintained by the Dept. of Housing, Local Government and Heritage was examined as part of the baseline study for this chapter of the EIAR on3rd of November 2022. The review established that there are no additional structures included in the NIAH situated within the application site. There are two additional structures within the study area included in the NIAH (see Table 6-2). The closest to the application a House in Killineer townland NIAH No. 13902427 is located 0.5km north of the application site and is considered to be too far distant to be directly or indirectly impacted by the proposal.

Table 6-2 Structures in the study area in the NIAH.

No.	13902427
Structure type	House
Townland	Killineer
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance:	Regional
Type of impact:	None
Significance & quality of impact	None
Description	Detached five-bay two-storey house, built c. 1830. Attached outbuilding to north. Pitched slate roof, clay ridge tiles, smooth rendered ruled-and-lined corbelled chimneystacks (recently repaired to east gable), concrete verge coping, cast-iron gutters to overhanging eaves, some replacement uPVC and aluminium gutters and downpipes. Painted roughcast-rendered walling. Square-headed window openings, dressed limestone sills, painted timber four-over-four and two-over-two sliding sash windows, c. 1880; six-over-six sliding sash window to east elevation; painted timber casement windows to north. Segmental-headed door opening, roll moulded render surround, painted timber panelled door with glazed upper panels and sidelights c. 1880, leaded anthemion fanlight,

	limestone threshold and paving. Set in own grounds; attached single-storey outbuilding to north forming east range of square courtyard, single and two-storey lime-washed random rubble masonry outbuildings, pitched slate and corrugated-iron roofs, square-headed openings, cast-iron lattice windows to east rang, some painted timber vertically-sheeted doors; random rubble masonry boundary wall with limestone coping; entrance to south-east having limestone square gate piers with pyramidal caps and wrought-iron gates.
Mitigation proposal	No mitigation required
Photos:	-
No.	**13902408**
Structure type	Farm House
Townland	Mell
Designation	None
Data source	National Inventory of Architectural Heritage
Perceived Significance:	Regional
Type of impact:	None
Significance & quality of impact	None
Description	Detached five-bay two-storey farm house, built c. 1870, now disused. Rectangular-plan, return to north, porch to south, attached to two-storey smooth rendered building to west. Pitched slate roofs, clay ridge tiles, painted timber bargeboards to gables, red brick stepped corbelled chimneystacks, half-circular cast-iron downpipes. Roughcast rendered walling, smooth rendered plinth and string course. Square-headed window openings, smooth rendered pedimented lugged-and-kneed surrounds to south and east, stone sills, painted timber one-over-one sliding sash windows, two-over-two sliding sash windows to east elevation. Square-headed door opening to south porch, door blocked up; square-headed door opening to north-east, painted timber four-panel door. Set in own grounds; smooth rendered ruled-and-lined outbuildings to south, pitched slate roofs, square-headed openings, painted vertically-sheeted timber doors, corrugated-iron shed attached to north elevation; stone outbuilding to south-west, pitched corrugated-iron roof; bounded by squared rubble stone wall, rendered coping, squared rubble square gate piers, pyramidal capping stones, wrought-iron gates. U-plan rendered outbuildings to south, stone outbuilding to south-west
Mitigation proposal	No mitigation required
Photos:	-

Field Survey

A field survey was carried out on the 15th of November 2022. This involved visiting and photographing all additional upstanding structures indicated on the 1938 Edition of the six-inch Ordnance Survey mapping within 100m of the proposed application site. There is one structure in this area that is not of special architectural interest (see Table 6-3). The buildings that are marked on the first edition OS map and the first edition 25-inch map in the application site were demolished before 1938. They no longer exist and therefore have no architectural significance.

Table 6-3 Non-designated structure within 100m of the application site included on the 1938 OSI mapping.

No.	1
Structure type	Cottage
Townland	Mell
Designation	None
Data source	1938 Edition of the six-inch Ordnance Survey mapping
Perceived Significance:	None. This structure has no value as an element of the vernacular-built heritage.
Type of impact:	None
Significance & quality of impact	None
Description	Four bay cottages with slate roof, single brick chimney, uPVC replacement windows and door. No special architectural interest.
Mitigation proposal	No mitigation required
Photos:	Figure 6-4.

Figure 6-4 View of Structure 1 looking south-east

6.4.4 Archaeology

Recorded Monuments

Examination of the Record of Monuments and Places for Co. Louth indicated that there are no Recorded Monuments located within the application site (see Table 6-3 and Appendix 7).

The closest Recorded Monuments to the application site externally are LH024-004001-, LH024-004002-, and LH024-004003-, a church, graveyard, and font in Killineer townland. They are described in the RMP as:

LH024-004001- Killineer Church

D-shaped graveyard to W of Killineer House. In centre is rectangular depression (max. dims. 14m by 4.5m), probably the church site. Church recorded as being ruinous in 1622, not rebuilt.

LH024-004002- Killineer Graveyard

D-shaped graveyard to W of Killineer House. In centre is rectangular depression (max. dims. 14m by 4.5m), probably the church site. Church recorded as being ruinous in 1622, not rebuilt.

LH024-004003- Killineer Font

A small font or stoup (LH024-041089-), now at the main door of St. Peter's Church (LH024-041004-) in Drogheda is thought to have come from Killineer graveyard.

These monuments are located c. 0.75km north of the application site and are considered too far distant to be directly or indirectly impacted by the proposed development.

The remaining recorded monuments in the study area are further distant from application site and are considered too far distant to be directly or indirectly impacted by the proposed development.

The Sites and Monuments Record

Examination of the Sites and Monuments Record (SMR) which is maintained by the Dept. of Housing, Local Government and Heritage on the 3rd of November 2022 indicated that there are no SMRs included within the application site (see Figure 6-2 and Appendix 8). The closest SMR to the application site externally is LH024-089--- the cropmark of a ringfort – rath in Mell townland. This is described in the SMR as:

LH024-089---- Mell Ringfort - rath

Located at the tip of a small, low W-E spur. It overlooks a curve to the E of a small N-S stream that is c. 170-200m distant. The cropmark of a circular enclosure (diam. c. 30m) defined by a single fosse is visible only on Google Earth (21/07/2021). This is within an outer oval enclosure (dims c. 60m NE-SW; c. 50m NW-SE) defined by single fosse, but the perimeters of both appear to coincide NW-N.

This monument is located c. 0.73km south-west of the application site and is considered too far distant to be directly or indirectly impacted by the proposed development.

The remaining SMR in the study area is further distant from application site and is considered too far distant to be directly or indirectly impacted by the proposed development.

Brú na Bóinne World Heritage Site

The boundary of the Brú na Bóinne World Heritage Site is located 3.2km to the south-west of the application site. This is too distant for the proposed development to have any impact on the setting of the World Heritage Site.

Cartographic Sources

The seventeenth century Down Survey mapping, as well as Ordnance Survey 1st and 3rd edition six-inch maps and the 1st edition 25-inch maps of the area were examined. The analysis did not indicate any previously unrecorded archaeological sites in the application area or vicinity. There are three structures indicated on the 1st edition map (See Figure 6-5). Only one of these structures is indicated on the 25-inch map. These three structures have been demolished and there is no visible indication of them at ground level (see Figure 6-6).

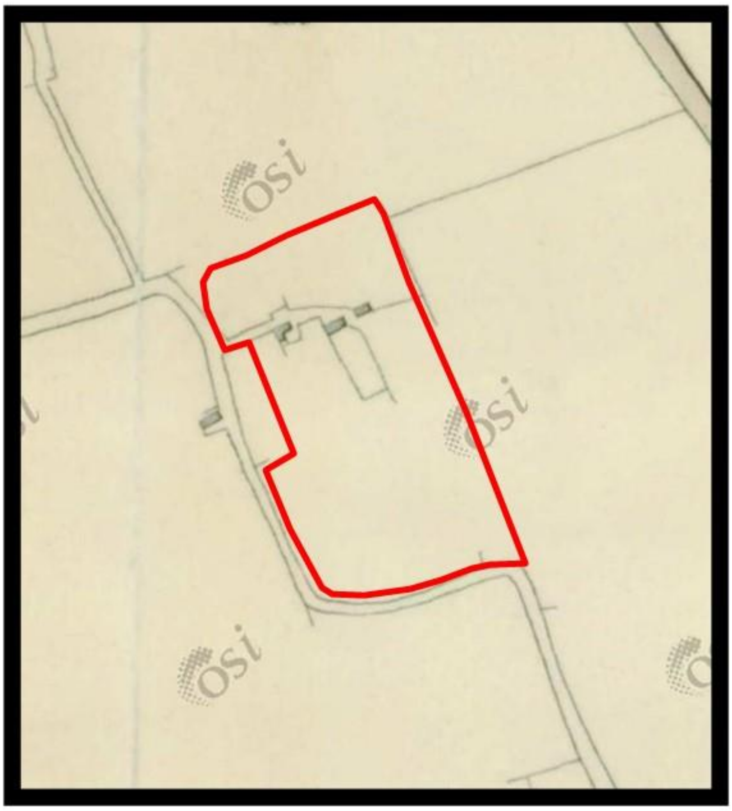

Figure 6-5 The application site (red line) superimposed on the Ordnance Survey 1st edition six inch map.

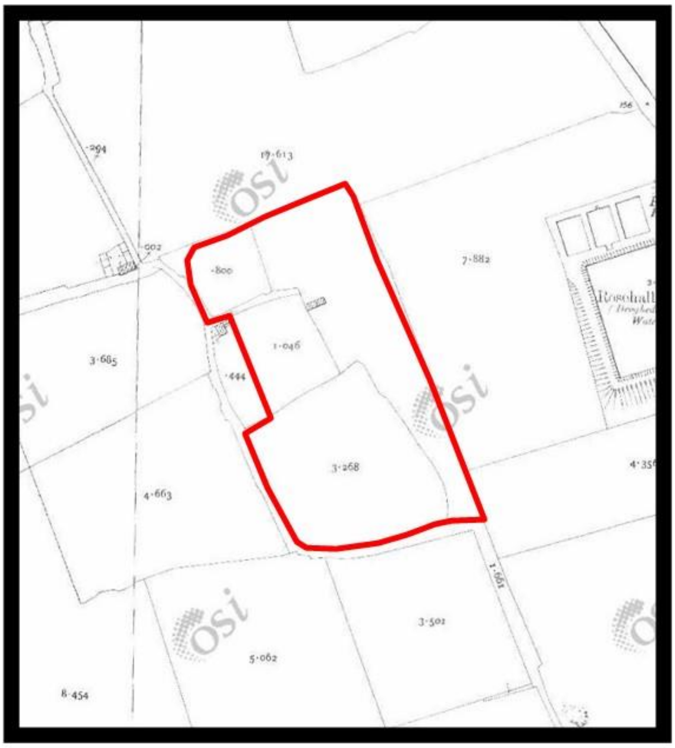

Figure 6-6 The application site (red line) superimposed on the Ordnance Survey 1st edition twenty-five inch map.

Placename Evidence

The place names were extracted from the cartography in order to facilitate the search for structures and monuments and small finds, to help identify any unrecorded monuments or structures, to search for any published papers and documents related to the study area and to assist in the study of the historical development of the area. The English translations of the townland names of the study presented above below are based on Logainm.ie. The placenames refer to land cover, proprietor's names and the church of Killineer RMP LH024-004001-.

Killineer	church of the satire
Mell	probably derived from the family name Beilleagach
Moneymore	great bog
Philipstown	land of the Philips family

Archaeological Investigations in the Study Area

There have been no licensed archaeological investigations carried out within the application area. There have been 10 investigation carried out in the study area that identified remains of a Neolithic structure, Beaker period occupation and burial, Late Bronze Age domestic activity, an Iron Age enclosure and ditches with post-holes and bowl furnaces and kilns, *burnt mounds,* enclosures, an *early medieval cemetery, ring-ditches and a cremation pit, souterrains and ditches, as well as* pits and smelting pits. The summaries of the investigations drawn from the Excavations Bulletin at excavations.ie are presented below.

- Water Under, Mell Monitoring 04E1687

Monitoring of earthworks was carried out on the site of a proposed development. The site is bound to the north by the M1 link road and to the east by Collon Road. The stratigraphy over the site comprised 0.3-0.4m of topsoil and ploughsoil overlying natural subsoil.

During topsoil-stripping a series of features were uncovered, including a penannular enclosure c.12m in diameter. Within and to the west of the enclosure were a series of nine subrectangular pits measuring c. 3m by 0.6m. Other features on the elevated ground to the south and west of the enclosure included a number of circular pits, at least four of which were smelting pits. Excavation will be conducted under a separate licence. Further monitoring scheduled on the development works will be reported in the next [excavation] bulletin.

- Water Under, Prehistoric settlement and Iron Age industry 05E0072

The site at Waterunder, Mell, Co. Louth, was identified during monitoring of development-related groundworks (Excavations 2004, No. 1118, 04E1687). It was located to the north of the River Boyne and west of Kenny's Stream and measured c. 80m by 80m. Excavation identified five levels of archaeological activity on site.

At the earliest level were the remains of a circular structure, which was dated by radiocarbon analysis to the Early Neolithic (3820–3690 cal BC). Structure A was c. 10m in diameter and was built on a south-east-facing slope at 35.9m OD. The structure comprised four curving slot-trenches, which formed an arc around the north-western extent of a metalled floor surface. The slot-trenches extended from the north-west to the south-east for c. 8m. The trenches were generally c. 2m long, 0.6–0.8m wide and up to 0.6m deep, but the south-eastern trench, F168, was only 1.1m long and 0.24m wide. There was a post-hole (0.3m in diameter and 0.15m deep) at the western end of the structure. Stone packing at the base of two of the trenches indicates that they supported a fairly substantial post and plank structure. Two levels of fill were evident within two of the trenches, but the other two trenches had only one fill. There was no evidence for an internal hearth or associated occupation levels, which suggests that Early Neolithic occupation on the site at Mell was temporary or short-lived.

The next level was dated to the Beaker period (c. 2400–2200 BC) and was represented by two successive phases of occupation and an inhumation burial. The site of Structure A, which had long since decayed, was reoccupied and three occupation deposits built up. Excavation recovered up to 500 sherds of Beaker pottery, most notably a polypod bowl sherd and worked flint. The deposits probably formed within a dwelling, but there was no evidence for any such structural remains. However, the presence of Beaker-period structures elsewhere on site was suggested by two post-holes located c. 10m to the east and two c. 47m to the north-east of the occupation deposits. A hearth, several cooking pits and rubbish pits near these post-holes probably result from associated domestic activity.

There was a crouched inhumation burial on high ground c. 60m north-west of the occupation deposits. The body was interred in a prone position in a partially stone-lined grave, which was 1.5m long, 0.85–1.2m wide and 0.25–0.35m deep. The remains were in a poor state of preservation but were identified as those of an adult female. Two flint scrapers and a flake accompanied the burial, and a sample of bone was dated to 2490–2200 cal BC.

Evidence for domestic activity during Level 3 came from a sherd of Late Bronze Age pottery (c. 1100–800 BC) recovered during monitoring, but which was not associated with any context.

Four phases of activity were identified within Level 4, which dates to the Iron Age. Phase 1 was characterised by the truncated remains of a penannular enclosure sited on the top of the hill on the eastern part of the site. The enclosure was 12m in diameter and the enclosing ditch was 28m in circumference and 1.2m wide. The ditch was heavily truncated and was only 0.01–0.2m deep. There was a wide (12m) gap or entrance at the north-western end of the enclosure and a small (5.8m by 4.5m) deposit along the western interior may be the remains of a bank. Two stake-holes (0.1m in diameter) and burnt ash and alder planks within the enclosing ditch suggest that it supported a structure of some sort. Dates of 770–400 and 520–360 cal BC were obtained for the enclosure. Three post-holes suggest that a structure stood within the western area of the enclosure, but its ground plan was no longer evident. The post-holes were 0.5m long, 0.35m wide and between 0.05–0.08m deep. A hearth and several pits near the enclosure were also indicative of domestic occupation. A second phase of occupation was evident from a pit, post-hole and a stake-hole, which cut through Phase 1 features.

Seven large post-holes arranged in an arc represented Structure B, which was 10m to the south-east of the penannular enclosure. The post-holes enclosed an area measuring 10m by 8m and ranged from 0.25 to 0.56m in diameter and 0.12 to 0.14m deep. The posts within three of the post-holes had burnt in situ. There was no evidence for a floor surface or occupation deposit associated with this structure, but a cooking pit and several rubbish pits in the vicinity were indicative of domestic occupation. The rubbish pits were 0.72–1.6m long, 0.58–0.9m wide and 0.08–0.2m deep. The cooking pit was 0.73m by 0.55m and 0.09m deep. There were inclusions of charcoal and burnt bone within their fills, but no datable finds were recovered from either the post-holes or pits. However, their proximity to the penannular enclosure and Structure B indicates that they are probably contemporary.

The third phase of occupation during Level 4 was represented by a curvilinear ditch, which cut the south-eastern edge of the penannular enclosure. The ditch was oriented north-east/south-west and was 40m long, 0.9–2.2m wide and 0.3–0.46m deep. The only find from this ditch was a broken copper-alloy artefact, which did not provide any precise dating evidence, but the lack of pottery suggests that it is more than likely to be Iron Age.

Level 4, Phase 4, was characterised by industrial activity which involved the production of iron in seven bowl furnaces and the processing of cereal in sixteen kilns. The bowl furnaces were located in the western part of the site and, with the exception of F73, they were arranged in pairs. They were circular in plan and one of the pair was generally larger than the other. The smaller furnaces averaged 0.2m wide and 0.2m deep and the larger pits were 0.75–0.9m wide and 0.35–0.5m deep. Their fills comprised charcoal and slag. Late Iron Age dates were obtained for one of the bowl furnaces (170 BC to cal AD 60). The kilns were spread right across the northern part of the site. The majority (eleven) were figure-of-eight-shaped, but there were also subrectangular (three) and key-hole-shaped (two) examples. They were 0.92–2.9m long and 0.62–1.62m wide. The fire bowls were mostly located at the northern end of the kilns, but there were some in the southern (four eastern (two) and western (one) ends. The majority of kilns were used for drying cereal and some had evidence for multiple firings. Two of the kilns returned Late Iron Age dates (cal AD 380–550 and cal AD 340–540) and the others are probably more or less contemporary. The most commonly identified grain was barley, but wheat and oat were also present. Cultivated oat seeds identified from one of the dated kilns show that oats were grown in the vicinity at a relatively early date.

Level 5 dates from the post-medieval period (c. 1700–1900 AD). It was represented by agricultural features which included a field boundary dated to the 17th–mid-18th century and a circular pit or well dating from the 18th century. The land on which the site was located would have been farmed by the occupants of Waterunder cottage during the 19th and 20th centuries.

- Tullyallen, Mell Enclosure 20E0088

Test excavations were carried out at the site of a proposed development at Tullyallen, Mell on the outskirts of Drogheda, Co. Louth. A total of 30 test trenches with a combined length of 2160 linear metres were excavated within the site. A single feature of archaeological significance was recorded in the course of testing. This consisted of an earth-cut enclosure with dimensions of c. 41.5m north-east/south-west by 40m. The ditch was recorded in 3 trenches at the north-west edge of the site and adjacent to the M1 motorway. The enclosure ditch had a wide, rounded shallow cut with dimensions of 2.7-3.4m wide by 0.67m deep. No datable artefacts were retrieved from the ditch. A possible ditch terminal was noted in Trench 2, indicating an eastern entrance.

- Mell 1 Fulacht fiadh 00E0946

A three-week excavation was conducted on this site, which was revealed in a section face on the N51 Link Road east of the Northern Motorway (Drogheda Bypass) where earthmoving had taken place before the start of archaeological monitoring. The site was 15m from a stream at the base of a ravine known locally as The Alts. Burnt mound material, up to 0.3m thick, was exposed for a distance of 10.8m (east–west) in the section face. The area available for excavation extended for 3.2m onto the road, where it was truncated by site works. The archaeological deposits continued north beyond the limit of the road.

The burnt mound material covered three features excavated into subsoil. A subrectangular pit, 1.5m x 1.2m and 0.8m deep, was filled with burnt stone. Adjacent to this, a subcircular pit, 1.5m in diameter and 0.41m deep, was filled with clean sand over a charcoal-rich, silty clay. The third cut, irregular in shape, was 0.4m deep, 1.1m wide and at least 1.6m long, continuing into the section face. Charcoal lining the base and sides of the cut was overlain by burnt stone and grey clay. There were no small finds. A post-medieval stone drain, 1.8m wide, cut through the prehistoric deposits.

- Mell 2 Early medieval cemetery and prehistoric cremation pit 00E0430

The site, which is 4km north-west of the town of Drogheda, was discovered during monitoring of topsoil-stripping for the Northern Motorway. A small dark spread was seen, which was cleaned back to reveal an oval ring-ditch. The site was excavated in July and August 2000.

Further cleaning back revealed a complex comprising an oval ring-ditch, a circular ring-ditch, a group of graves orientated east–west, a small burnt spread and another dark spread. The work concentrated on the graves and the burnt spread, as the construction schedule required that this area should be resolved first.

The cemetery comprised nine graves and two pits. Seven graves and one pit were arranged in a slightly staggered row. Two other graves and the second pit lay to the west of this. Bones were found in five of the graves; only three of these were reasonably complete skeletons, and in these the bones were very brittle. The graves had rounded ends. Most of them had a crude stone lining. The stones appeared to have been added after the graves had been partly filled. In one case, a third line of stones ran along the middle of the grave, over the skeleton, and in another the grave was completely filled with stones. A silver ornament was found in one of the graves, a few centimetres to the right of the point where the skull would have been. It was a small hook-shaped object, with one end decorated with an animal head and the other with a perforation and tang.

Immediately to the east of the graves was a triangular dished area 1m x 0.75m, containing ash, charcoal, burnt clay and small fragments of cremated bone. Post-holes were found on three sides, filled with similar material to the dished area. This may have been a cremation pyre associated with the ring-ditches.

- Mell 2 Ring-ditch and ditched enclosure 00E0430 ext.

The site of Mell 2 was discovered by Kieran Campbell as part of monitored topsoil-stripping along the route of the Northern Motorway. Prior to its discovery, the site was unknown and presented no surface profile. An excavation licence was issued to Thaddeus Breen for the entirety of this site, which included the enclosures and a number of Early Christian graves. While the graves were excavated (Excavations 2000, No. 695), the ditched enclosures were left undug. This licence was later reissued for the two remaining ditched enclosures. This phase of the excavation took place between 23 February and 11 May 2001.

Mell 2 was situated c. 4.5km north-west of Drogheda town and c. 1.2km south-east of Tullyallen village. The surrounding area comprised open pastureland, which sloped gently to the west and south, falling gently into the valley of the River Boyne. The site lay at approximately 34.15m OD and possessed extensive views in all directions, especially into the Boyne river valley to the south.

Site A: ditched enclosure

Site A comprised an annular ditch (C20) with rounded ends and parallel sides, enclosing a shallow ditch (C19) running diagonally across it along with two shallow post-holes (C303 and C308) and one stake-hole (C307). Externally the C20 ditch measured 19.26m east–west by 11.91m (15.67m east–west by 8.53m internally). In profile, C20 had steep, splayed sides and a narrow, rounded base. The average width of this ditch was 1.99m, with a mean depth of 1.65m. It contained 20 fills. The majority of these appeared to be various forms of redeposited subsoil which possessed very little charcoal content and produced few finds.

In the southern and south-western portions of Site A, a recut of the C20 ditch was noted. In profile, this cut appeared as a splayed ‘U’ shape with gradual sides and a concave base (11.26m x 1.5m x 0.55m deep). This recut contained six identifiable fills. Again, the majority of these fills were archaeologically sterile and appeared as redeposited subsoil. A second recut (C100) was visible in the south-western to south-eastern portions of the ditch. In section this recut appeared as a splayed ‘U’ shape with gradual sides and a concave base (32.35m x 1.1m x 0.69m) and contained some eight fills. The general character of these fills was dark and charcoal-rich, many containing quantities of burnt stone, struck flint and cremated bone. Where this bone was identifiable it was composed of both human and animal remains. The identified animal species included both pig and cattle. Through the north-western to south-western portions of the ditch a final partial recut was noted. In section, this recut appeared as a widely splayed 'U' shape with sides varying between steep and gradual and a concave base (29.18m x 0.87m x 0.4m). It contained nine fills. Again, the majority of these fills were dark and charcoal-rich and produced substantial quantities of burnt bone, coarse pottery, struck flint and carbonised hazelnut shells. One of these fills produced a decorated glass bead. Like the fills of the C100 recut, the skeletal material included evidence of both human and animal remains. With the exception of the phalanx of a juvenile pig, most of the animal bone could not be defined by species.

A long, shallow ditch (C19) ran diagonally across Site A. At its south-eastern corner it cut a fill of the C100 recut of the C20 ditch. From this point it ran north-west, where it terminated by the pit C310. C19 had sides which varied from steep to gradual with an undulating base (13.35m x 0.8m x 0.2m deep). This ditch contained a series of sixteen post-holes. Of these, two had evidence of posts burnt in situ. Inside the eastern and western arcs of the ditch two post-holes were also encountered.

While there is a difficulty in finding close morphological parallels for this site within the published literature, the general character of the pottery spans the period from the later early Bronze Age to the middle Bronze Age and appears to be derived from a number of large vessels with simply rounded or flattened rims (Anna Brindley, pers. comm.). However, it also appears that much of this material is in secondary, possibly derived, contexts.

Site B: ring-ditch

Site B comprised an annular ring-ditch and a number of internal features. The ring-ditch (C21) measured 9.14m in overall diameter (7.55m in internal diameter). In profile it had sides which varied from steep to shallow and had an irregular base. The average width of this ditch was 0.4m, with a mean depth of 0.45m; it contained twelve fills. These produced quantities of pottery, flint, possible slag, and both burnt and unburnt bone. In all cases the burnt bone could not be categorised as either animal or human. Although none of the unburnt bone could be categorised as to species, it was positively identified as animal.

Within the area enclosed by the ring-ditch were a shallow pit (C221) and a stake-hole (C225). Neither of these produced any finds and the fills of both were covered by F22, which is interpreted as the remains of the basal layer of an original mound, enclosed by the C21 ditch. In particular, C221 produced no indication that it had been prepared to receive human remains of any kind. F22 also covered C248, interpreted as a possible tree root, pre-dating the construction of the ring-ditch and its postulated internal mound.

The sink-hole

In the northern portion of the site a natural sink-hole was discovered. At the top this feature appeared as a suboval, measuring 1.47m north-east/south-west by 0.67m east–west. This narrowed to a curving shaft, 0.67m by 0.27m. The upper fill of this feature produced quantities of flint, pottery, slag and a fragment of a porcellanite axe. While none of the recovered pottery presented clearly diagnostic features, it appears that at least two vessels are represented, possibly of early Bronze Age date. This sink-hole is interpreted as a naturally occurring feature into which archaeological material became deposited. However, whether this deposition was a deliberate, ritualistic act or whether the sink-hole merely acted as a receptacle for occupational detritus is not possible to distinguish.

Mell 3 Souterrain and earlier features 00E0631

The site, which is 4km north-west of the town of Drogheda, was discovered during monitoring of topsoil-stripping for the Northern Motorway. Two dark features were seen, and a small area collapsed in two places nearby, revealing the presence of a souterrain. The site was excavated between August 2000 and February 2001.

Souterrain

This was fully excavated. It was approximately L-shaped, with a beehive chamber at the lower end. The total length (extended) was 36.88m, of which the roof was intact for 11.6m. The floor sloped downwards from a shallow entrance. The average height of the roofed area was 1.1m, and it was 0.72m wide. The beehive chamber had collapsed in antiquity, but its walls survived to a height of up to 1.4m. There were no subsidiary passages, but there was one change in level. Approximately halfway along the souterrain was a step 0.45m high. The passage continued at that level for c. 3.76m, before dropping again. This may originally have been a step, but the area had collapsed in antiquity and simply sloped down. A drain ran under this raised area, evidently to prevent water from ponding up in front of the step. The water was not diverted out of the souterrain but continued into the lower part. The lowest layer in the beehive chamber was a 0.2m layer of fine clay, obviously deposited by successive flooding. In the unroofed part of the souterrain, north of the step, three isolated lintels survived. Two of these were ordinary flat lintels but relatively large, which is probably why they were left in situ. The third, at one of the corners of the souterrain, was placed on edge, with its largest surface vertical. The narrow edge would have protruded below the level of the other lintels, creating a hazard for intruders. No other features such as cupboards or air-vents were found. Apart from the clay layer in the beehive chamber, the fill of the souterrain consisted of either collapse, as in the beehive chamber, or deliberate backfilling, as in the unroofed part of the passage.

The latter was almost completely devoid of finds. The former contained a few finds, of very mixed dates, obviously from the ploughsoil. A piece of clay pipe stem was found in the collapsed material in the beehive chamber; a piece of green bottle glass and some sherds of Carrowkeel ware were found in collapsed material at one of the two points where the souterrain was first seen. A bronze mount decorated with openwork interlace was found in topsoil 70m from the souterrain while the site was being cleaned back.

Nearby features, possibly associated

A gully, 0.25m deep, ran parallel to the east–west part of the souterrain, turning southwards to echo the plan of the souterrain. This may have been a drain to prevent water running into the souterrain. The only trace of a structure near the souterrain was a series of six post-holes, four of which formed a straight, north–south line. The area immediately to the west had been disturbed by the construction of a water-tower in the 1970s. No evidence of date was found, nor could the structure be linked stratigraphically to any other feature on the site. It could not have extended as far as the souterrain entrance. No trace was found of a ringfort or similar structure enclosing the souterrain. Two of the ditches found (A and B, see below) could have been contemporary, but these were further down the hill and appeared to be field boundaries rather than enclosure ditches.

Ditch A

A patch of dark soil 27m south-east of the souterrain was found to be a V-sectioned ditch, 1.56m deep, 2–3.5m wide, running from east to west across the site for 24m. Its eastern end went beyond the take of the road and was truncated by preliminary construction work before the excavation. The fill consisted mostly of sterile clay resembling the subsoil. Above this was a shallow deposit of dark brown, sandy soil, which produced the only find from that feature, a piece of iron slag.

Ditch B

A similar dark patch was found 41.5m south of Ditch A. This was another ditch, running north-east/south-west. It was 29m long, 1.18m deep, 1.7–2.8m wide. Its eastern end curved northwards, but, like Ditch A, it had been truncated by construction work. The fill consisted of dark grey, sandy material, with darker, almost black, material underneath. Some twigs and animal bones were present. Finds included a lignite spindle-whorl, part of a lignite bracelet and a blue glass bead.

Ditch C

This came to light when the area beside the souterrain was trowelled back. It was beside the souterrain and was cut by it at one point. V-shaped in section, it was 1.6m wide and 0.7–2m deep. Like Ditch A, it seemed to have been backfilled with natural subsoil, and there was a darker layer on top. This layer contained a sherd of pottery, as yet unidentified, and some possible cremated bone.

Ditch D and occupation layers

At a distance of 20m south of the souterrain, a spread of darker soil was investigated. It contained pottery, possibly Neolithic, but this has not yet been confirmed. Flint flakes were found, mostly debitage. There were also traces of burning and a curvilinear V-shaped ditch, 0.6m deep and 1.5m wide. The surviving length was 13.11m (it had been truncated at either end by construction work).

- Mell 3 Souterrain 00E0631 ext

Excavation of this souterrain, commenced during 2000 (Excavations 2000, No. 696) continued. The roof having already been removed, the walls were recorded and dismantled, and the construction trench was fully excavated.

Two ditches to the west of the souterrain were also excavated. Both of them crossed the site in an approximately north-west/south-east direction, but they had both been truncated by the construction of a haul-route before excavation.

The first, Feature F, was 27m south-west of the souterrain. It was 2–3.5m wide, and ranged in shape from a shallow U-sectioned ditch 0.4m deep, towards the west, to a V-sectioned ditch 1.56m deep, closer to its eastern end. The fill consisted mostly of light grey/brown sterile clay resembling the subsoil. The only find was a piece of iron slag.

The second ditch, Feature G, was 41m south of the souterrain. It was a V-sectioned ditch, 1.18m deep, and 1.7–2.8m wide. The three main fills were dark and silty. Finds included a flint blade, cores and débitage, prehistoric pottery, a cylindrical wooden object, and two items of lignite or similar material: a spindle-whorl and a fragment of a bracelet.

- Mell 4 Fulacht fiadh 01E0067

Excavations took place from 5 to 26 January 2001 on a fulacht fiadh uncovered in May 2000 during monitoring of topsoil-stripping for the Northern Motorway (Gormanston to Monasterboice). The site was in a boggy hollow between two east–west ridges on which extensive archaeological deposits were excavated as part of the same road scheme (Hill of Rath by Carmel Duffy, Excavations 2000, No. 687, 00E0088; Mell 3 by Thaddeus Breen, Excavations 2000, No. 696, and No. 870 above, 00E0631; and Mell 5 and 6 Excavations 2000, Nos 697–8, 00E0945 and 00E0940).

The site came to light when burnt mound material was extruded from below the stripped ground surface by the weight of laden dumper trucks. A deposit of burnt stones in charcoal-stained silty clay lay in a 0.1m-thick spread, 10.5m east–west by 8m, and filled four pits excavated into the natural clay subsoil. Contractor's earthworks had truncated the site to the west and wheel ruts had damaged two of the pits. Of these, Pit 016 was c. 1m in diameter and 0.48m deep, while Pit 018 survived as a linear cut 0.85m by 0.45m and 0.12m deep. A subcircular pit (020), 1.2m by 1.4m and 0.2m deep, had a lining of burnt stones on the base. The fill of a large shallow pit or scoop (025), 3m by 1.6m and 0.16m deep, produced a flint scraper and five waste flakes, three probably from the same nodule.

- Mell 5 Fulacht fiadh 00E0945

Topsoil removal on the Northern Motorway (Drogheda Bypass) uncovered a spread of burnt mound material with overall dimensions of 13m (north–south) by 8.8m. The site had been truncated on the east and west sides by agricultural drainage and reclamation works of late 19th-century date. A 3m-wide field boundary ditch ran east–west through the north end of the site.

The levelled burnt mound deposit had a maximum thickness of 0.3m and sealed a number of pits filled with similar material. A subrectangular pit, 2.6m x 1.8m and 0.6m deep, with sloping sides becoming vertical towards the base, may have functioned as a trough. Three further pits were oval or subrectangular in shape; the largest measured 2.48m x 1.2m and was 0.36m deep. An isolated pit 7m south of the burnt mound was 0.32m deep and measured 0.95m (north–south) by 0.94m, being truncated on the west by the same agricultural activity that had disturbed the main site. The pit had an upper fill of ashy silt overlying heat-fractured stones. Flint was plentiful on the site, both debitage and nodules derived from the underlying natural gravels.

- Mell 6 Prehistoric pit 00E0940

A shallow pit, damaged by bulldozer tracks during topsoil removal on the Northern Motorway (Drogheda Bypass), measured 0.83m x 0.58m and was 0.14m deep. Sherds of coarse pottery, some heat-fractured stones and portion of a large granite maul(?) were recovered.

The County Development Plan

No sites of archaeological importance, National Monuments, or protected structures listed in the Louth County Development Plan 2021-27 are located within the proposed application site or vicinity.

Remote sensing

Examination of the Ordnance Survey 1995, 1999-2000, 2004-2005, 2005-6 and 2013-2014 aerial imagery as well as Google earth imagery from 2005, 2007, 2009, 2011, 2013, 2017, 2018, 2019, 2020, 2021 and 2022 and Bing imagery from 2018 did not indicate any additional archaeological or cultural heritage sites in the application site (see Figure 6-7). Examination of LIDAR imagery captured by the OPW in 2011 (OPW_3076) did not indicate any additional archaeological or cultural heritage sites in the application site (see Figure 6-8).

Figure 6-7 The application site (red line) superimposed on a Google Earth aerial image taken in August 2022

Figure 6-8 The application site (red line) superimposed on OPW Lidar imagery captured in 2011 OPW_3076. Contains Irish Public Sector Data (Geological Survey Ireland & the Office of Public Works) licensed under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence.

Published Sources

Examination of archaeological corpus works on prehistoric artefacts (Harbison 1969, Eogan 1983, 2000, Kavanagh 1991, Simpson 1990), and pottery (O'Riordain and Waddell 1993) and Iron Age material (Raftery 1984) did not reveal any additional material in the study area.

6.4.5 Field Assessment

A field assessment was carried out on the 15th of November 2022 to identify any previously unknown archaeological, or portable finds, or cultural heritage sites in the application site. See Figure 6-7 for an aerial image of the application area. It is a generally trapezoidal-shaped area of south-sloping agricultural ground enclosed by field boundaries with hedgerow, with mature trees and brambles at east, south and part of the west and is open to the north (see Figure 6-9). The southern part of the area is completely overgrown with shrubs, small trees, brambles and gorse (see Figure 6-10). There is no visible indication of any archaeological or cultural heritage material at ground level.

Figure 6-9 Panoramic view of application area looking south.

Figure 6-10 Panoramic view of the southern overgrown part of the application area looking west.

6.5 Impacts of the development

6.5.1 Construction stage

Direct impacts

No direct impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application site or the vicinity during the construction stage have been identified by the assessment. There is a potential for unknown items of indeterminable significance to occur, that would be a direct effect of negative significance occurring within the site and would be permanent in duration.

Indirect impacts

No indirect impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity during the construction stage have been identified by the assessment.

6.5.2 Operational stage

Direct impacts

No direct impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity during the operational stage have been identified by the assessment. The boundary of the Brú na Bóinne World Heritage Site is located 3.2km to the south-west of the application site and the proposal will have no impact on the setting of the World Heritage Site.

Indirect impacts

No indirect impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity during the operational stage have been identified by the assessment.

6.5.3 Unplanned events

Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports indicates that EIARs should address unplanned effects as relevant (examples include accidents, spills, floods and fires). Directive 2014/52/EU further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned. The Directive gives examples of ‘flooding, sea level rise, or earthquakes’.

Direct impacts

No direct impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity arising from unplanned events such as major accidents and disasters including spills, floods and fires have been identified by the assessment.

Indirect impacts

No indirect impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity arising from unplanned events such as major accidents and disasters including spills, floods and fires have been identified by the assessment.

6.5.4 Cumulative impacts

No known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity have been identified by the assessment. No impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application site or the vicinity have been identified by the assessment and no cumulative impacts have been identified.

6.5.5 'Do-nothing' impacts

In the event that the proposed development did not proceed, effects on archaeology, cultural heritage or buildings of heritage interest Cultural Heritage would not arise.

6.5.6 Worst-Case Scenario

In the worst case scenario, soil-stripping associated with the development may have a significant, irreversible negative/adverse impact on unknown subsurface archaeological material without preservation by record taking place. The risk in unquantifiable and therefore the significance of the overall effect is moderate.

6.5.7 Table of Impacts

Table 6-4 Table of Impacts

Scenarios where Impacts may arise	Potential Impact				Quality of Effect	Significance of Effect	Extent/Context of Effect	Probability	Duration	Type of Effect
	Activity	Attribute/ receiving environment	Importance of attribute/sensitivity of receiving environment	Nature of Effect (description)						
Construction phase	Topsoil and subsoil stripping	Potential subsurface archaeology	Indeterminable	Direct	Potential Negative/adverse	Moderate	Within the site	Potential	Permanent	See Section 6.5.6 'Worst case'
Operational phase										
Unplanned Events										

Table 6-5 Table of Mitigation Measures

Scenarios where Impacts may arise	Potential Impact			Mitigation measure	Residual effect (following mitigation)	
	Activity	Attribute/receiving environment	Nature of Effect (description)	Description	Significance or quality of Effect	Probability
Construction phase	Topsoil stripping	Potential subsurface archaeology	Direct	Archaeological monitoring. Any archaeological material identified during archaeological monitoring should be preserved in situ or by record under licence from the National Monuments Service.	None	Unlikely
Operational phase						

Unplanned Events						

6.6 Mitigation measures

No direct or indirect impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity during the construction or operational stages of the proposed development or as a result of an unplanned event have been identified by the assessment.

6.7 Monitoring measures

Due to the possibility of the survival of previously unknown subsurface archaeological deposits or finds within the application site topsoil-stripping should be monitored by a qualified archaeologist. Any archaeological material identified during archaeological monitoring should be preserved in situ or by record under licence from the National Monuments Service.

6.8 Residual impacts

No residual impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application site or the vicinity arising from the project have been identified by the assessment.

6.9 Interactions with other impacts

No known items of archaeology, cultural heritage or buildings of heritage interest have been identified in the application site or the vicinity by the assessment and therefore no interactions with any other environmental factor has been identified.

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7 LAND, SOILS & GEOLOGY

7.1 Introduction

The following section has been prepared by Colin O'Reilly PhD (Hydrology) and Eoin Moorhouse BSc of Envirologic Ltd., on behalf of Hibernia Steel (Manufacturing) Limited. It is intended to satisfy the requirements of Louth County Council relating to proposed development works at Mell, Drogheda, Co. Louth.

The aims of this EIAR section are to:

1. Conduct a review to establish current baseline conditions relevant to the land, soil and geological environment within the site boundary, and the local surrounding environs;
2. Assess the potential impacts to the land, soil and geological environment, which can be reasonably expected to occur as a result of the proposed development;
3. Recommend suitable mitigation measures to address any adverse impacts.

7.1.1 Statement of Expertise

Dr. Colin O'Reilly has a doctorate degree in soils systems and hydrology. He has over 15 years of professional and field-based experience as a hydrogeologist coupled with a primary degree in agricultural science which was followed by a doctorate degree in hydrology, awarded by the Centre for Water Resources Research, School of Architecture, Landscape and Civil Engineering, UCD, while a recipient of a Teagasc Walsh Fellowship. Envirologic has key competencies in hydrogeology and hydrology. Colin is a current and active member of Engineers Ireland and International Association of Hydrogeologists (Irish Group).

Eoin Moorhouse is employed by Envirologic as a graduate hydrologist. Eoin has a primary degree in Marine Science which was followed by two years working in a Galway-based private consultancy. Eoin has experience of EIAR preparation and as part of this chapter was responsible for site work and GIS mapping.

7.2 Methodology

The initial evaluation consisted of inspections of the site and adjacent lands by examination of aerial photography and Ordnance Survey maps, followed by site walkover survey in December 2022. Relevant geological data from the Geological Survey of Ireland (1:100,000 Sheet 13: Geology of Meath) was reviewed together with additional data collated from sources at Louth County Council, Environmental Protection Agency (EPA), Ordnance Survey of Ireland (OSI), Teagasc and Met Éireann.

The report has been compiled primarily taking cognisance of:

- *Guidelines for the preparation of soils, geology and hydrogeology chapters of environmental impact statement* (IGI, 2013)
- *Revised guidelines on the information to be contained in Environmental Impact Statements* (EPA, 2015);
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (DoHPLG, 2018)*;*
- *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022).

No difficulties were encountered during this assessment.

7.3 Characteristics of the development

7.3.1 Description of Activities

The application area is 3.419 ha (34,190 m^2). To the north is a part-built (currently closed) access road linking Chapel Lane (L6323) to the R132, which will be completed as part of the IDA's plans for the wider lands at this location (see Section 2.3.2). The site comprises primarily scrub / overgrown land. There is a northwest-southeast slope across the site with maximum elevation of 47 mOD noted at the northern end and minimum elevation of 38 mOD at the southern end. The site comprises part of lands to be developed as an IDA business park.

The primary activity proposed as part of development works is a hot-dip galvanising facility with zinc kettle. It is planned to process up to 36,000 tonnes per annum (TPA) of steel at this plant. The main building has a footprint of 5,179 m^2. An office building has a footprint of 298 m^2.

7.3.2 Use of Natural Resources

There will be no significant removal from the site of the natural resources soil, subsoils and bedrock as part of proposed works. Preparation works will involve stripping of soil and minor excavation of subsoil to provide a suitably level surface for buildings, foundations and yard areas and to facilitate sub-surface drainage and attenuation. It is expected that there will be no export of soils or subsoils off-site. Soils and subsoils not suitable for use as fill within the site will be used in landscaping and the perimeter berm. Clean stone will be imported for the formation of levels for buildings and yard construction.

During the construction phase diesel will be consumed by plant and machinery, predominantly excavator and tractor-trailer for preparation works, haulage trucks for importing material and concrete mixer trucks. It is envisaged that gravel and concrete will be sourced locally to minimise diesel use.

7.4 Receiving environment

7.4.1 Land

In terms of regional topography, the site is influenced by its position on the northern side of the Boyne valley. The surrounding area is gently undulating with hilltops generally in the range 40 – 60mOD, with lands continuing to climb northwards to higher hills 2 km to the northwest at Red Mountain (134 mOD) and Tulleskar (162 mOD). More locally, OS 1:50,000 Discovery Map Series shows site elevations are between 40 and 50 mOD, rising gently towards a small hilltop which peaks at 57 mOD, 170 m northwest of the site.

The site is bounded to the north by the access road linking Chapel Lane to the R132. The site is bounded to the west and south by a local road known as Chapel Lane. The R132 connecting Drogheda with Monasterboice passes in a northwest-southeast direction 50 m to the east while the M1 runs along the same orientation 900 m to the west.

The site has been unmaintained in recent years and as a result is overgrown with small trees, grasses and brambles. There are existing hedgerows along the eastern, southern and part of the western boundary while the northern boundary is open. There are footpaths along the access road linking Chapel Lane to the R132.

Land use in the surrounding area is predominantly agricultural (supporting tillage) / open scrubland. The surrounding fields to the east, south and west are all in agricultural production.

There are 2 residential properties located adjacent to the western boundary. A one-off house is located 150 m west of the site with a short linear cluster of 3 houses nearby on the eastern side of the R132. Otherwise housing density in the area is relatively low. Housing increases significantly 1.5 km to the southwest which marks the edge of the Drogheda built up area.

There are two reservoirs within close proximity to the site, these being Rosehall reservoir 130 metres to the east and Killineer reservoir 600 metres to the north. Killineer reservoir is the larger of the two with a footprint of approximately 23,500 m^2 and is understood to form part of the Drybridge Public

Water Supply Scheme. The smaller Rosehall reservoir has a footprint of approximately 7,000 m^2 and is understood to have been decommissioned in 2015.

In addition there are three open lagoons 600 – 1,100 m to the south which are a legacy from historical quarrying in the area, where bedrock has been quarried out below surrounding groundwater levels.

7.4.2 Soils

Reference was made to Soil Associations of Ireland (Gardiner & Radford, 1980) and Teagasc soil maps which show that the soils underlying the site are deep and poorly-drained (Figure 7-1). These are composed of mostly gleys (80%) with a minor proportion of grey brown podzolics (20%). The profile is characterised by a relatively high clay and silt content (35% and 40%, respectively) and weak structure. Poor drainage tends to prevail even on favourable slopes due to the compact and fine-grained texture of the underlying subsoils.

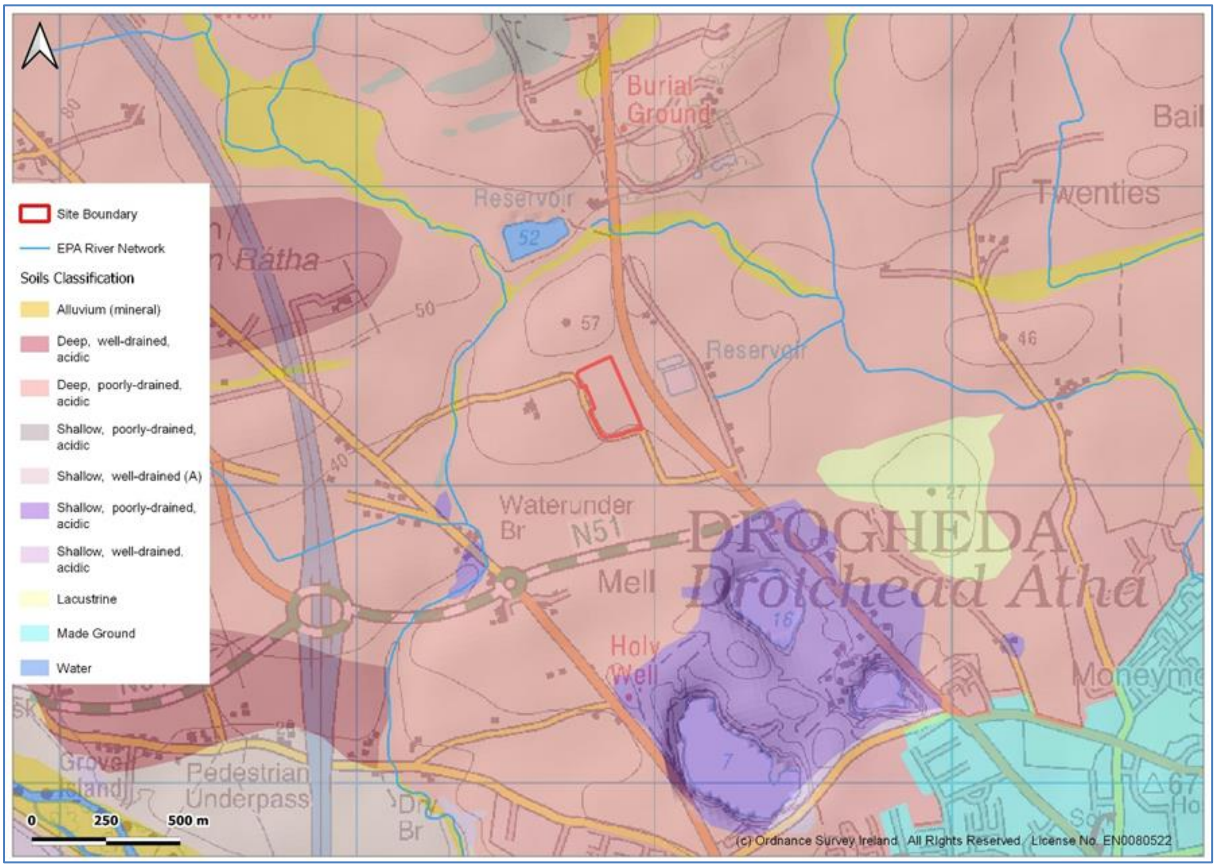

Figure 7-1 General Soils Classification

7.4.3 Quaternary Deposits

The Quaternary is the geological period which began 2.6 million years ago and is characterised by ice-ages; cycles of colder, glacial conditions in mid- to high-latitudes interspersed with the warmer 'interglacial' periods in which we live today. In Ireland, our Quaternary history of repeated glaciations has resulted in sculpted landforms and thick sedimentary deposits overlying bedrock across much of the country.

Figure 7-2 shows that quaternary deposits (GSI) in the application area consist of a low permeability till derived from Palaeozoic sandstones and shales. To the immediate south of the site the quaternary deposits are described as Irish Sea Till derived from Lower Palaeozoic sandstones and shales.

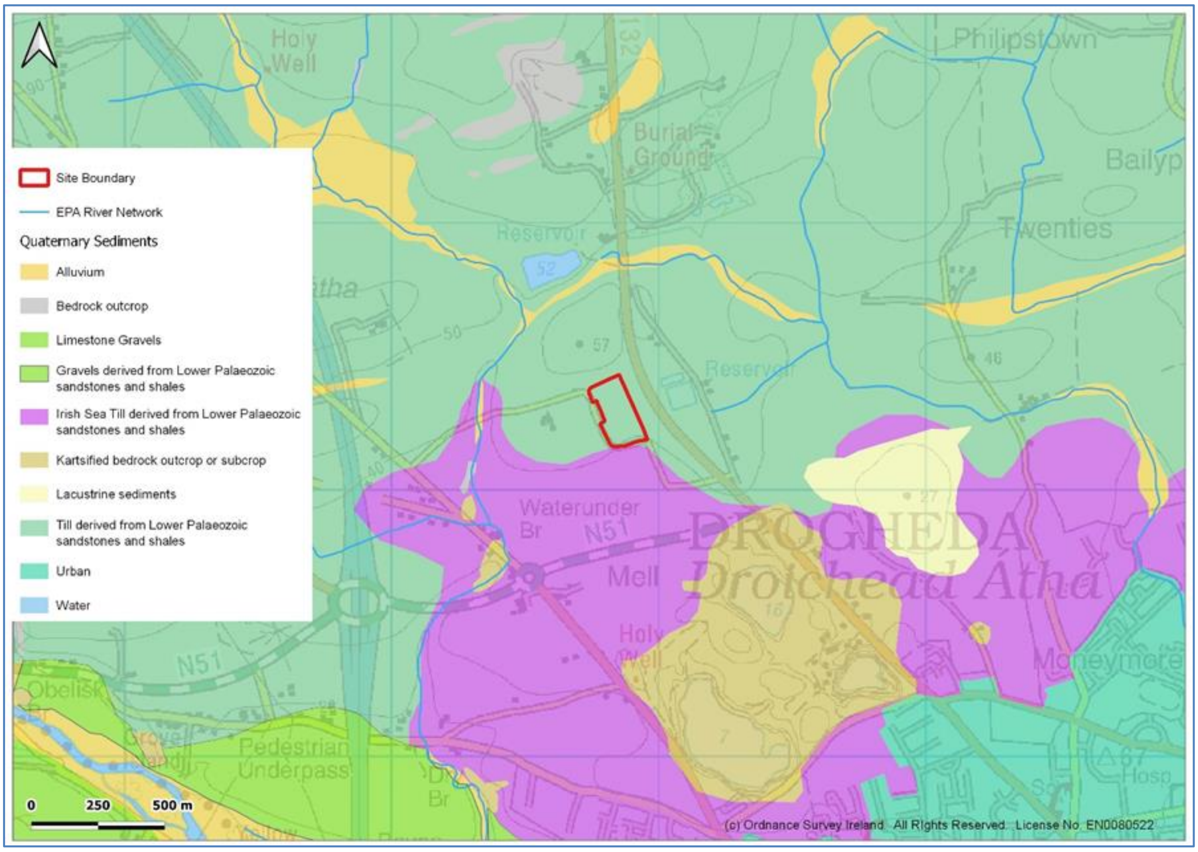

Figure 7-2 Quaternary Deposits

Bedrock & Structural Geology

The bedrock and structural geology in the vicinity of the site is illustrated in Figure 7-3. The 1:100,000 GSI bedrock geology (McConnell & Philcox, 1994) shows the majority of the application site to be underlain by the Glaspistol Formation, described as black mudstone and greywacke, laid down during the Silurian era as metasediments. Bedding depths are stated as being variable. The southern end of the site is underlain by the Tullyallen Formation, a. pale-grey thickly-bedded limestone. These limestones are relatively clean and pure.

Primary faulting in the area trends northeast-southwest direction, with a fault separating the two formations described above.

7.4.4 Geological Heritage

The application site is not within a geological heritage area. There are however two geological heritage sites in close proximity, these being:

- Mell Quarry, 375 m south = a complex of disused quarries. The limestone is the best exposure of the Tullyallen Formation in the region.
- Waterunderbridge-Dry Bridge (LH032), 500m southwest = a karstic sinking river. The site is mostly in a narrow, shallow gorge with the sometimes dry streambed running through it.

Neither of the above listed geological heritage sites are at risk of impact from the proposed development works.

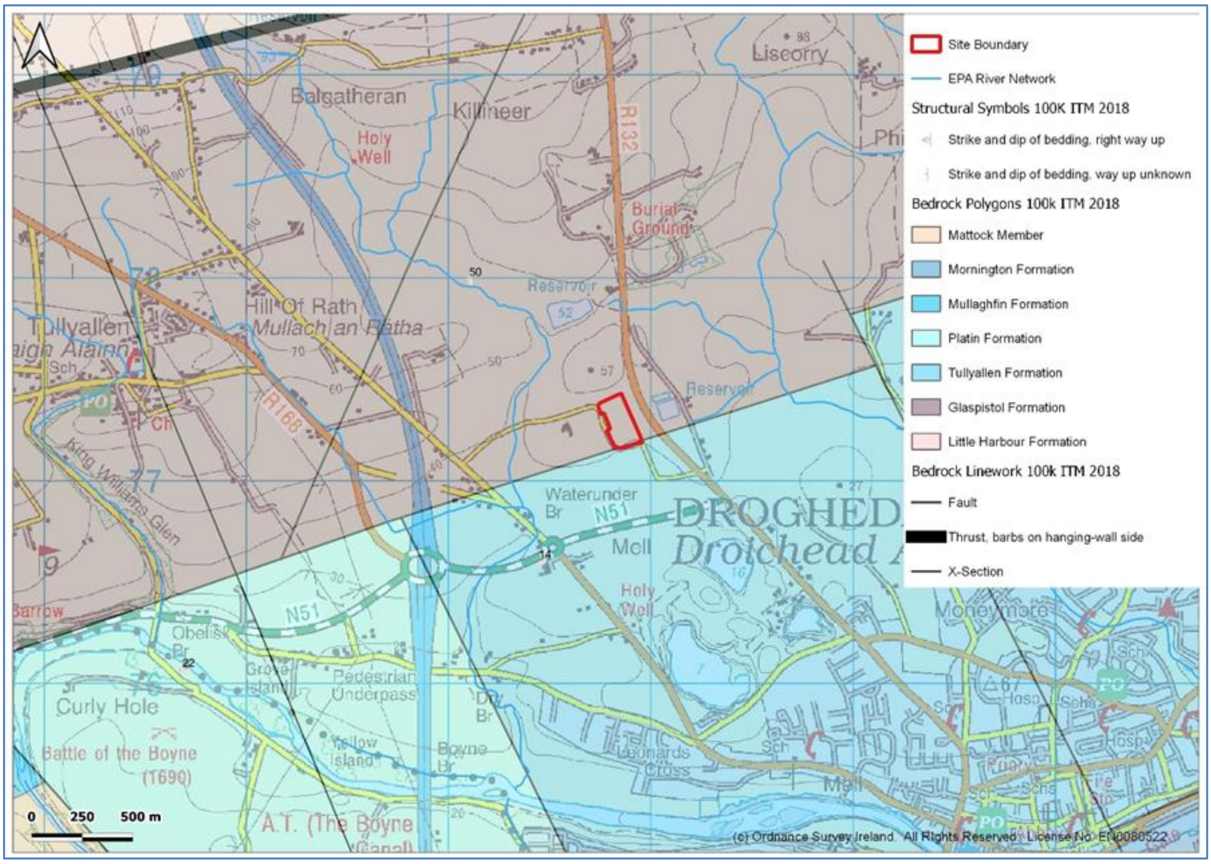

Figure 7-3 Bedrock and Structural Geology

Historical Site Investigation Works

The client provided Envirologic with the below information:

Extensive site investigation works were performed across the lands to be developed as an IDA business park in 2021, involving excavation of 24 trial pits (TP1 – TP24) and drilling of six boreholes (BH1 – BH6). Of these, two boreholes were drilled (BH5 and BH6) and six trial pits were excavated (TP01 – TP06) within the application site. The locations of these boreholes and trial pits are shown below in Figure 7-4.

BH5 was drilled in the northern part of the application site with BH6 closer to the southern boundary. Both boreholes were terminated in glacial deposits at 7 m. The profiles at both locations were different, being described as follows:

- BH5 (northern):
    - 0 – 0.4 m = topsoil
    - 0.4 – 3.5 m = medium dense, yellow-brown, silty sandy clayey GRAVEL (fine to course, subangular to subrounded)
    - 3.5 – 7.0 m = medium dense, brown, silty sandy very clayey GRAVEL (fine to course, subangular to subrounded)
- BH6 (southern)
    - 0 – 0.3 m = topsoil
    - 0.3 – 4.3 m = firm, light brown, sandy CLAY with gravel content
    - 4.3 – 7.0 m = dense, yellow-brown, silty sandy clayey GRAVEL (fine to coarse, subangular)

The lithology logs show that clayey gravels are present from surface to base of hole in the northern part of the site whereas in the southern portion of the site the same gravels were covered in 4 m of gravelly clay glacial till.

These observations correlated with the trial pit logs. All trial pits were excavated to a depth of 2.6 - 3.3 m using a 13 tonne tracked excavator. All of the trial pit layers were logged as gravelly clay with the exception of a shallow silt band between 1.5 and 1.9 m in the southern part of the site. Progressing from south to north through the site corresponded with an increase in content of sand, gravel, cobbles and boulders.

Representative soil samples were collected by the supervising engineer throughout the site investigation. Results of laboratory analysis showed that there are no concentrations of contaminants that exceed the adopted Generic Assessment Criteria (GAC) or (GrACs) for human health. It was therefore concluded that there are no significant potential risks to human health from soil.

Figure 7-4 Locations of boreholes and trial pits

7.5 Impacts of the development

The procedure for determination of potential impacts on the receiving land, soil and geological environment is to identify potential receptors within the site boundary and surrounding environment and use the information gathered during the desk study and field work to assess the degree to which these receptors will be impacted upon. Effects are described in terms of quality, significance, extant and context, probability, duration and frequency, and type in accordance with current EIAR guidelines, with particular reference to Table 3.4 of the EPA Guidelines (EPA, 2022).

In accordance with the NRA Guidelines (2009) (as included in 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (IGI, 2013)) soils and subsoils at the site are deemed to be an attribute of Low importance (see Table 7-1). There is no interaction with bedrock associated with proposed activities.

Table 7-1 Criteria for Rating Site Importance of Geological Features (IGI, 2013)

Magnitude	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying the site is significant on a national or regional scale	• Geological feature on a regional or national scale (NHA). • Large existing quarry or pit. • Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying the site is significant on a local scale	• 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) • Well drained and/or high fertility soils • Moderately sized existing quarry or pit • Marginally economic extractable mineral resource
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying the site is moderate on a local scale	• Contaminated soil on site with previous light industrial usage • Small recent landfill site for mixed wastes • Moderately drained and/or moderate fertility soils • Small existing quarry or pit • Sub- economic extractable mineral resource
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying the site is small on a local scale	• Large historical and/or recent site for construction and demolition wastes • Small historical and/or recent landfill site for construction and demolition wastes • **Poorly drained and/or low fertility soils** • Uneconomic extractable mineral resource

In accordance with the NRA Guidelines (2009) (as included in 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (IGI, 2013)) the magnitude of impact on soils and subsoils at the site is deemed to be small (adverse) to negligible (see Table 7-2).

Table 7-2 Criteria for Estimating Magnitude of Impact on Geology Attribute (IGI, 2013)

Magnitude	Criterion	Description and Example
Large Adverse	Results in loss of attribute	- Loss of high proportion of future quarry or pit reserves - Irreversible loss of high proportion of local high fertility soils ▪ Removal of entirety of geological heritage feature - Requirement to excavate / remediate entire waste site - Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment

Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	- Loss of moderate proportion of future quarry or pit reserves - Removal of part of geological heritage feature - Irreversible loss of moderate proportion of local high fertility soils - Requirement to excavate / remediate significant proportion of waste site - Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	- Loss of small proportion of future quarry or pit reserves - Removal of small part of geological heritage feature - Irreversible loss of small proportion of local high fertility soils and/**or high proportion of local low fertility soils** - Requirement to excavate / remediate small proportion of waste site - Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	**No measurable changes in attributes**
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

The matrix in Table 7-3 determines the significance of the impacts based on the site importance and magnitude of the impacts as determined by Table 7-1 and Table 7-2. The significance of the impacts to geological receptors is deemed to be Imperceptible.

Table 7-3 Criteria for Rating of Significant Environmental Impacts (IGI, 2013)

Importance of Attribute	**Magnitude of impact**			
	Negligible	**Small**	**Moderate**	**Large**
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/significant	Profound
High	Imperceptible	Moderate/slight	Significant/moderate	Severe/significant

Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	**Imperceptible**	Slight	Slight/moderate

The potential impacts from the construction and operational phases of the proposed development are included below and in further detail in Table 7-4.

7.5.1 Construction stage

Direct impacts

The primary activity to be considered under construction phase is the stripping of soils and excavation of subsoils down to required formation levels in preparation of ground for installation of concrete foundations for buildings, concrete yard, hardcore yard and asphalt surfaces. This overburden will be stored temporarily in stockpiles and subsequently used in perimeter berm and site landscaping.

The effect of this activity on soils and subsoils is considered to be a direct, permanent, once-off, adverse impact confined to the area upon which new infrastructure is to be implemented. In terms of probability the nature of this effect is likely, even when mitigation measures are taken into account. Handling of soils and subsoils during excavation can lead to dust generation and potential for mobilisation of sediment by erosion and subsequent migration in runoff to watercourses.

The area upon which groundworks will take place is overgrown with small trees, grasses and brambles and is currently disused. Given the low quality of the soils in terms of agricultural or geological importance the effect on land in the area is considered to be of Imperceptible significance (see Table 7-3).

There is potential for encountering contaminated overburden during excavation. Based on the information provided by the client there were no evidence of contaminated soils or subsoils within the site.

The use of machinery during the construction phase has potential for contamination of exposed soils, subsoils and bedrock with hydrocarbons by way of leakages from machinery and spillages during refuelling. Washout from readymix concrete trucks also provides potential risk of impact to exposed soils, subsoils and bedrock.

Indirect impacts

Impacts to soils and subsoils are confined within the planning application boundary and there are no indirect impacts to soils and subsoils outside the site boundary. There will be no indirect impact to underlying bedrock. There is no impact to geological heritage sites in the area.

7.5.2 Operational stage

Direct impacts

Impact to land, soils and geology during the operational phase must be considered in terms of installation of foundations, buildings and hardstanding. The removal of overburden to facilitate development will be long-term, likely, and relatively small in terms of extent. That part of the site upon which installation of foundations, buildings and hardstanding is proposed is currently covered in soil so there will be a direct and permanent adverse effect to underlying soil and geological receptors. However, as shown in Table 7-3 the significance of this impact is considered to be Imperceptible.

The installation of hardstanding can be considered to have a positive impact in terms of the protection it will offer underlying overburden and geological receptors from potential contaminants at surface. All potentially contaminating substances and activities shall be contained within the proposed buildings.

Indirect impacts

There are no envisaged indirect impacts to the land, soils and geological environment during the operational phase of the proposed development.

7.5.3 Unplanned events

Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports indicates that EIARs should address unplanned effects as relevant (examples include accidents, spills, floods and fires). Directive 2014/52/EU further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned. The Directive gives examples of 'flooding, sea level rise, or earthquakes'.

Direct impacts from Unplanned events/ accidents

Consideration has been given to environmental impacts associated with unplanned events such as accidents, emergencies and extreme weather events. Unplanned events such as spillages or leakages of hydrocarbons or chemicals, or uncontrolled release of firefighting water have the potential to contaminate exposed soils and subsoils during the construction phase. Excessively high winds have the potential to create dust during excessively dry periods. In terms of probability the effects are unlikely though the duration of any event has potential to be long-term. An effect associated with an unplanned event during the construction phase will generally be adverse and will likely be limited to imperceptible to moderate significance, given the lack of chemicals in use or stored on site during construction. The extent of the effect on soils will generally be confined to the site due to the presence of low-moderate permeability subsoils. An effect associated with an unplanned event during the operational phase will generally be adverse and will likely be limited to imperceptible to slight significance, as a result of the overburden being covered in buildings and external hardstanding.

7.5.4 Cumulative impacts

The primary development works involve stripping of soils and excavation of subsoils to formation level. This overburden will be reused in perimeter berms and site landscaping. Clean stone will be imported to provide a level base for all structures and concrete hardstanding and foundations shall be installed to support the proposed building.

Effects arising in respect of existing developments are considered within the assessment of the receiving environment, and as such are considered cumulatively with the effects of the proposed development as set out in this Chapter.

In accordance with EIA legislation and Table 3.5 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (see Section 1.9 of Chapter 1), a search was undertaken for approved developments, but not yet built or operational, of relevance to the consideration of cumulative effects in respect of Land, Soils & Geology and none were identified.

7.5.5 Do-nothing Impacts

This item requires consideration of the effect on the environment in the future should the proposed works not be carried out. If the proposed works are not carried out the site will remain in an unused condition and the effects of the project on Land, Soil and Geology considered in this EIAR would not arise.

7.5.6 Summary of Potential Impacts

Table 7-4 Summary of potential impacts

Scenarios where impacts may arise	Activity	Attribute/ receiving environment	Importance of attribute/ sensitivity of receiving environment	Nature of effect (description)	Quality of effect	Significance of effect	Extent & Context of effect	Probability	Duration	Other Impacts
Construction phase	Preparation of foundations, buildings, external hardstanding	Soil/Subsoil	Low: low permeability subsoils; poorly-drained soils supporting agricultural production	Direct: excavation of soil/subsoil, storage in stockpiles and reuse in berms and landscaping	Adverse	Imperceptible	Negligible: small proportion of local sols, all within application boundary	Likely	Permanent	Indirect: No indirect impacts; Cumulative impacts: No significant cumulative impacts; Do-nothing effects: see Section 7.5; Residual effects: see Section 7.8.
	Handling of overburden	Soil/Subsoil	Low	Direct: loss of soil due to erosion and dust generation	Adverse	Imperceptible	Negligible: small proportion of local sols, all within application boundary	Unlikely	Temporary	
	Encountering contaminated soils/subsoils during excavation	Soil/Subsoil	Low	Direct: potential for mobilising contaminants	Adverse	Slight-profound	Negligible (based on the information provided by the client).	Unlikely	Short to long-term	

	Use of hydrocarbons	Soil/Subsoil / Bedrock	Low	Direct: potential contamination of exposed soils/subsoils/underlying bedrock as a result of spillages/leakages	Adverse	Moderate	Negligible: small proportion of local sols, all within application boundary	Unlikely	Short to medium-term	
	Washout of cement trucks	Soil/Subsoil	Low	Direct: potential for contamination of exposed soil/ subsoil	Adverse	Moderate	Negligible: small proportion of local sols, all within application boundary	Unlikely	Short term	
Operational phase	Use and storage of fuels/ hydrocarbons/chemicals	Soil / subsoil / Bedrock	Low	Direct: Potential for contamination of underlying soil/subsoils and bedrock during refuelling or due to leakage	Adverse	Moderate/ Significant	Negligible: small proportion of local sols, all within application boundary	Unlikely	Medium	Indirect: No indirect impacts; Cumulative impacts: No significant cumulative impacts; Do-nothing effects: see Section 7.5;

										Residual effects: see Section 7.8
Unplanned events	Fuel tank failure or large scale spillages of fuels/hydrocarbons/chemicals	Soil / subsoil / Bedrock	Low	Direct: Potential for contamination of soils/subsoils and/or bedrock	Adverse	Moderate	Localised: confined to site	Unlikely	Medium	Indirect: No indirect impacts; Cumulative impacts: No significant cumulative impacts; Do-nothing effects: see Section 7.5; Residual effects: see Section 7.8.
	Uncontrolled release of firefighting water	Soil / subsoil / Bedrock	Low	Direct: Potential for contamination of soils/subsoils and/or bedrock	Adverse	Significant	Localised: confined to site	Unlikely	Medium	
	High winds	Soil / subsoil	Low	Direct: Loss of soils due to erosion and dust generation during construction	Adverse	Imperceptible	Localised: confined to site	Unlikely	Temporary	

7.6 Mitigation measures

The potential impacts identified in Table 7-4 are resolved under the mitigation measures set out under Table 7-5. The following primary mitigation measures relating to land, soils and geology will be included as part of the development proposal:

1. Control measures for prevention of contamination of soils and subsoils from hydrocarbons.
2. Control measures for prevention of migration of suspended solid.
3. Dust suppression during movement of overburden within the site.
4. Site contours during construction and operational phases should be such that there are no direct pathways for suspended solids to leave the site via uncontrolled runoff.

7.6.2 Summary of Mitigation Measures

Table 7-5 Monitoring Measures- Summary of mitigation measures

Scenarios where impacts may arise	Potential Impact			Mitigation measure	Residual effect (following mitigation)	
	Activity	Attribute/ receiving environment	Nature of effect/description	Description	Significance or quality of potential impact	Probability of potential impact
Construction phase	Preparation of foundations, buildings and external hardstanding area	Soil/subsoil	Direct: excavation of soil/subsoil, storage in stockpiles and reuse in berms and landscaping	It is expected that there will be no export of soils or subsoils off-site. Soils not suitable for use as fill within the site will be used for non-structural landscaping.	Neutral	Likely
	Handling of overburden	Soil/subsoil	Loss of soils due to erosion and dust generation	Movement of material shall be minimised in order to reduce degradation of soil/subsoil structure and generation of dust. Handling and placement of soils/subsoils shall only take place during appropriate weather conditions and when the soils are in optimum condition (moist but friable). Soils shall not be moved when they are too dry or during unusually windy conditions. Silt fences and temporary settlement ponds shall be utilised to prevent loss of sediment across the site boundary. Site contours should be such that there are no direct pathways for suspended solids to leave the site via uncontrolled runoff. Sprinklers and road sweepers shall be used to suppress dust. Disturbance and movement of soils should not take place during dry spells combined with high winds.	Neutral	Unlikely
	Encountering contaminated subsoils during excavation	Soil/Subsoil	Potential for mobilising contaminants	Previous site investigations do not suggest any contamination. Should any unusual staining or odour be noticed, samples of soil/subsoil shall be analysed by an accredited laboratory. If contaminated soil is encountered, it will be required to be removed by a licensed contractor.	Neutral	Unlikely
	Use of hydrocarbons	Soil/subsoil/bedrock	Potential for contamination of exposed soils/subsoils/underlying bedrock as a result of spillages/leakages	Potentially contaminating substances will be stored in designated areas that are isolated from surface water drains or open waters. Hazardous wastes such as waste oil, chemicals and preservatives will be stored in designated, sealed containers. Fuelling, lubrication and storage areas will be in a designated area away from excavation works and not within 30 m of drainage ditches or surface waters. All waste containers shall be stored within a secondary containment system (e.g. a bund for static tanks or a drip tray for mobile stores and drums). The bunds will be capable of storing 110% of tank capacity, plus a minimum 30 mm rainwater allowance where the bund is uncovered. Where more than one tank is stored, the bund must be capable of holding 110% of the largest tank or 25% above the aggregate capacity. Drip trays used for drum storage must be capable of holding at least 25% of the drum capacity.	Imperceptible	Unlikely

				Regular monitoring of water levels within drip trays and bunds due to rainfall will be undertaken to ensure sufficient capacity is maintained at all times. There will be no storage of fuels on site. Refuelling shall be by mobile bunded bowser at a designated area, i.e. site compound, or where possible off-site. An adequate supply of spill kits and hydrocarbon absorbent packs shall be stored in works area.		
	Washout of cement trucks	Soil/Subsoil, bedrock	Potential for contamination of exposed soil/subsoil	All ready-mixed concrete shall be delivered to site by truck. A suitable risk assessment for wet concreting shall be completed prior to works being carried out. Washdown and washout of concrete trucks will take place at an appropriate facility off-site.	Neutral	Unlikely
Operational phase	Use and storage of fuels/ hydrocarbons/chemicals	Soil, subsoil, bedrock	Potential for contamination of underlying soil, subsoils and bedrock	There will be a concrete floor in the internal area in the building and a concrete apron will be provided around the building. This will protect soils, subsoils and bedrock on the most actively used parts of the site. Fuels/chemicals will be stored within the building in suitable containers and bunded as required. Diesel for forklift trucks and LPG for heating shall be stored outside in appropriately bunded tanks. Where more than one tank is stored, the bund must be capable of holding 110% of the largest tank or 25% above the aggregate capacity. Drip trays used for drum storage must be capable of holding at least 25% of the drum capacity. Regular monitoring of water levels within drip trays and bunds due to rainfall will be undertaken to ensure sufficient capacity is maintained at all times. An adequate supply of spill kits and hydrocarbon absorbent packs shall be stored on site and staff members shall be trained in their appropriate use.	Negligible	Unlikely
Unplanned events	Fuel tank failure or large scale spillages of fuels/hydrocarbons/chemicals	Soil/subsoil/bedrock	Potential for contamination of soils/subsoils and/or bedrock	Fuels/chemicals will be stored within the building in suitable containers and bunded as required. Hazardous wastes such as waste oil, chemicals and preservatives will be stored in sealed, bunded containers. All waste containers will be stored within a secondary containment system (e.g. a bund for static tanks or a drip tray for mobile stores and drums). An adequate supply of spill kits and hydrocarbon absorbent packs shall be stored on site.	Neutral	Unlikely
	Uncontrolled release of firefighting water	Soil/subsoil/bedrock	Potential for contamination of soil/subsoil	In the event of a fire the lower concrete yard and stormwater attenuation tank will be used to retain firewater. Shut off valves on attenuation tanks will be in place to prevent release of fire water.	Moderate	Unlikely
	High winds	Soil/subsoil	Loss of soils due to erosion and dust generation	Subsoils shall not be removed under excessively windy conditions.	Neutral	Unlikely

7.7 Monitoring measures

7.7.1 Construction Phase

A designated person from the project management team will have overall responsibility for ensuring that all operations are carried out in such a way as to minimise potential impacts to soils and geological receptors. This person will also have responsibility of monitoring the performances of the pollution control measures adopted to ensure that the proposed development is not impacting on the environment. All personnel working on the site will be trained in the implementation of site procedures during a site induction meeting.

7.7.2 Operational Phase

Not applicable with respect to land, soils and geology.

7.8 Residual impacts

Residual impacts refer to the degree of environmental change that will occur after the proposed mitigation measures have taken effect.

During the operational phase infiltration of stormwater to soakaways and permeable paving will provide connectivity between surface activities and the underlying soil and geological resources. Activity on permeable paving will be limited to staff and visitor parking. Activity on gravel areas will be limited to storage of untreated and treated steel. All stormwater generated on concrete yards will pass through an appropriately sized interceptor.

Assuming implementation of the mitigation measures described above the residual impacts on the soil and geological environment during the construction and operational phases are assessed to be permanent and negligible.

7.9 Interactions with other impact

The EIAR guidelines (EPA, 2022; DHPLG, 2018) highlight that the interaction of impacts to the land, soils and geological environment, arising from proposed activities, must be given due consideration alongside potential receptors identified in other EIAR sections. The likely interactions have been identified as occurring during the construction phase, and are listed as follows:

1. The movement of soils and subsoils can give rise to increased dust emissions (construction phase).
2. The operation of plant associated with soil movement can give rise to increased noise emissions (construction phase).

3. The extraction of overburden can impact upon biodiversity and cause disturbance to habitats in the area.
4. Haulage of stone into the site has the potential to increase traffic volumes.

Each of these issues and the mitigation measures proposed are addressed in detail in the relevant sections of this EIAR. These impacts are considered to be negative but with suitable measures in place, their significance can be reduced.

7.10 Bibliography

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8 WATER

8.1 Introduction

The following section has been prepared by Eoin Moorhouse BSc and Colin O'Reilly PhD (Hydrology) of Envirologic Ltd., on behalf of Hibernia Steel (Manufacturing) Limited. It is intended to satisfy the requirements of Louth County Council relating to proposed development works at Mell, Drogheda, Co. Louth.

The aims of this EIAR section are to:

- Conduct a review to establish current baseline conditions relevant to the hydrological and hydrogeological environment within the site boundary, and the surrounding environs;
- Assess the potential impacts to the hydrological and hydrogeological environment, which can be reasonably expected to occur during the construction and operational phases as a result of the proposed development;
- Recommend suitable mitigation measures to address any adverse impacts.

8.1.1 Statement of Expertise

Dr. Colin O'Reilly has a doctorate degree in soils systems and hydrology. He has over 20 years of professional and field-based experience as a hydrogeologist coupled with a doctorate degree in hydrology, awarded by the Centre for Water Resources Research, School of Architecture, Landscape and Civil Engineering, UCD, while a recipient of a Teagasc Walsh Fellowship. Colin's company is Envirologic, which has key competencies in hydrogeology and hydrology. Colin is a current and active member of Engineers Ireland and International Association of Hydrogeologists (Irish Group).

Eoin Moorhouse is employed by Envirologic as a graduate hydrologist. Eoin has a primary degree in Marine Science which was followed by two years working in a Galway-based private consultancy. Eoin has experience of EIAR preparation and as part of this chapter was responsible for site work and GIS mapping.

8.2 Methodology

The initial evaluation consisted of inspections of the site and adjacent lands by examination of aerial photography and Ordnance Survey plans, followed by site walkover surveys in December 2022 and January 2023. Hydrological desk study information was validated through surveying of local channels and watercourses. Hydrogeological desk study information was validated through monitoring well installation, groundwater level monitoring and groundwater quality analysis. These results facilitated an assessment of baseline groundwater and surface water quality.

Relevant hydrogeological data from the Geological Survey of Ireland (GSI) was reviewed together with additional data collated from data sources at Environmental Protection Agency (EPA), Ordnance Survey of Ireland (OSI) and Met Éireann.

The report has been compiled primarily taking cognisance of:

- *Guidelines for the preparation of soils, geology and hydrogeology chapters of environmental impact statement. Institute of Geologists of Ireland (2013);*
- *Revised guidelines on the information to be contained in Environmental Impact Statements. Environmental Protection Agency (2015);*
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. Department by the Department of Housing, Planning and Local Government (2018);*
- *Guidelines on the information to be contained in Environmental Impact Assessment Reports. Environmental Protection Agency (2022).*

No difficulties were encountered in the preparation of this chapter.

8.3 Characteristics of the development

8.3.1 Description of activities

The application area is 3.419 ha (34,190 m^2). To the north is a part-built (currently closed) access road linking Chapel Lane (L6323) to the R132, which will be completed as part of the IDA's plans for the wider lands at this location (see Section 2.3.2). The site comprises primarily scrub / overgrown land. There is an existing concrete pad 164m^2 in the northeastern corner of the proposed site, presumably developed with the previous minor infrastructural works carried out within the wider IDA landholding (prior to acquisition by the IDA). There is a northwest-southeast slope through the site with maximum elevation of 47 mOD noted at the northern end and minimum elevation of 38 mOD at the southern end.

Some roads and infrastructural works (including the aforementioned access road linking Chapel Lane to the R132) have been previously carried out (but not completed) within adjoining lands north /

north-west of the application site. The site comprises part of lands to be developed as an IDA business park (see Section 2.3.2).

The proposed development will consist of a hot-dip galvanising facility with zinc kettle. It is planned to process up to 36,000 tonnes per annum (TPA) of steel at the plant. The proposed main building has a footprint of 5,719 m^2 and includes four main areas: (i) in-take/out-take, (ii) process area, (iii) services, and (iv) staff facilities. In addition there will be an office (298 m^2) close to the site entrance.

There will be no processing of materials on external areas. Outdoor storage of steel products awaiting galvanising and galvanised steel products is proposed on the external gravel (hardcore) areas adjacent to both the intake and out-take sides of the main shed (i.e. east and west of south end of main building).
A new car parking area is proposed in the northern part of the site. The car parking area will be accessed via internal roads constructed from asphalt.

8.3.2 Potential Contaminants

In general the galvanising process consists of the following steps:

- Stripping (acid bath) (HCl) to remove zinc and other impurities
- Degreasing (alkaline bath) (TIB Clean-A 300).
- Rinse
- Pickling to remove iron oxides & scales (acid bath) (HCl)
- Rinse
- Fluxing to prepare surfaces for the metallurgical phase by applying a saline layer that facilitates the Iron-Zinc bonding process. (Double salts $ZnCl_2$ & NH_4Cl)
- Galvanising – immersion in molten zinc. Zinc kettle approx. 14.5mx1.8mx3m. The zinc is slowly heated to the melting point of Zn (ca. 450^{0}C) and maintained at that temperature. The Zinc kettle will rarely be shut down.
- Passivation is an optional step to prevent the formation of iron oxides post galvanisation.
- Buffering

All chemicals required for this process will be stored within the main building in suitable containers and bunded as required. Waste chemicals are stored in the services area and disposed off-site by authorised contractor.

8.3.3 Water Sources

Potable water will be supplied from the public mains. The subject application proposals include for water services within the application site as far as the application site boundary. Onward connection between the wider IDA lands and the Irish Water network will be completed as part of IDA Ireland's plans for the wider lands at this location (See Chapter 2), and these works do not comprise part of the subject application proposals. Non-potable water is supplied from rainwater harvesting and from public mains. Refer to Proposed Water Main Layout drawing (ref. C216-DR-BCON-CE-102).

Peak water demand at the site will be 15m^3/hr. This is mainly used for replenishment of drag out(degreaser) and evaporation losses and make-up of fresh pickling baths. Annual water demand for processing is estimated to be 1,500 m^3/annum.

8.3.4 Process Water

There will be no process wastewater generated. There will be no discharge of process waters, treated or otherwise, from the site.

8.3.5 Domestic Wastewater

Domestic wastewater generated at the facility will be connected to the Irish Water sewer system. The subject application proposals include for foul water services within the application site as far as the application site boundary. Onward connection between the wider IDA lands and the Irish Water network will be completed as part of IDA Ireland's plans for the wider lands at this location (see Chapter 2), and these works do not comprise part of the subject application proposals.

During the construction phase portable toilets will be utilised and emptied as appropriate by a licensed contractor.

8.3.6 Stormwater Management

There is currently no on-site stormwater infrastructure. Rejected rainfall on the south-sloping part of the site is currently collected in an open drain on the southern boundary.

Rejected rainfall on the smaller north-sloping part of the site is currently collected in the road drainage network to the immediate north. An open ditch in the north-western corner of the site was noted as containing stagnant water. It appears to provide a hydrological connection between the northernmost of the two adjacent houses and Chapel Lane. Historical aerial imagery suggests that this small channel was installed between 2007 and 2011 as part of historical site development works. Envirologic could not ascertain that this historical channel serves any purpose at present.

A shallow east-west ridge set back 50 m from the northern boundary defines a north-south catchment divide within the site. Boylan Engineering commissioned infiltration testing in December 2022/January 2023 with a view to informing optimal stormwater management design. The results have guided a stormwater management scheme tailored towards the different subsoil infiltration properties in the northern and southern parts of the site.

Infiltration rates in the northern part of the site are sufficient to dispose of all stormwater generated in this area to ground. This area is primarily parking and the following infiltration approaches are proposed:

- Permeable parking bays for cars and some truck parking is designed to manage 1 in 100 year rainfall plus 20% climate change growth factor.
- 378 no. SC310 Stormtech units (footprint 941 m^2; volume 235 m^3) to manage runoff generated on internal access roads (asphalt) in the northern part of the site, upper concrete yard and asphalt road entrance. These units are designed to manage 1 in 100 year rainfall plus 20% climate change growth factor.
- Clean rainfall on main building roof will be captured in a rainwater harvesting tank and will be used to replenish the pre-treatment tanks and for filling toilets.

Infiltration rates in the southern part of the site are lower than in the northern area. It is therefore proposed that rainfall-runoff generated in the southern part of the site will pass through an attenuation storage device before being released to a field drain along the southern field boundary at greenfield runoff rates via a hydrobrake. Specifications are briefly as follows:

1. Area = 2.22 ha;
2. Concrete attenuation tank sized to accommodate 1 in 100 year rainfall plus 20% climate change growth factor (footprint 210 m^2, volume 380 m^3);
3. Outflow from attenuation tank restricted to QBAR (13.5 l/s) using a hydrobrake;
4. No increase above current rainfall-runoff rates for storm events with a return period of less than 100 years;
5. Clean rainfall on roof of main building and office will be captured in a rainwater harvesting tank and re-used for processing purposes and toilets.

6. Outfall from hydrobrake will discharge to southern boundary drain at southeastern corner of site.

8.3.7 Stormwater Treatment

All rainfall-runoff generated on internal roads (asphalt) and upper concrete yard will pass through an appropriately sized full retention hydrocarbon interceptor (NSFA080 or similar approved).
All rainfall-runoff generated on the lower concrete yard will pass through an appropriately sized full retention hydrocarbon interceptor (NSFA200 or similar approved).
A shut off valve is proposed to be installed after the attenuation device in the southern part of the site. A shut off valve shall be installed on the outlet of the interceptor in the northern part of the site. The shut-off valves are used to withhold surface runoff during a potential contamination event (e.g. spillage, fire).

8.3.8 Firefighting Water

Firefighting water will be obtained from hydrants from the potable water supply, discussed above.

8.3.9 Spent Firefighting Water

In the unlikely event of a fire the stormwater attenuation tank and lower yard will be used to retain fire water. The valves in the attenuation tank will be shut off to prevent migration of contaminated fire water to surface water. This will be constructed in accordance with 'Guidance on Retention Requirements for Firewater Run-off' (EPA, 2019).

8.3.10 Use of natural resources

Water will be sourced from a mains supply. Rainwater is planned to be harvested at the site to supplement this supply.

Liquid petroleum gas (LPG) will be used to fuel the furnace for heating the zinc kettle, pre-treatment tanks and drier. LPG will be stored on site in 2 No. 2T tanks. 720,000m^3 gas per annum will be consumed by the facility.

Electricity will be sourced from a connection to the grid. Electricity may ultimately be generated from fossil fuels or renewables (e.g. wind, solar).

8.4 Receiving environment

8.4.1 Land, Soils and Geology Summary

There is a northwest-southeast slope across the site with maximum elevation of 48 mOD noted at the northern end and minimum elevation of 38 mOD at the southern end.

Intact soils on the greenfield site are deep and poorly drained, composed primarily of gleys. Trial pitting showed that the lithological profile is 300-400 mm of topsoil underlain by approximately 4 m of firm to stiff gravelly clay which become more gravelly towards the northern of the site (where they were logged as clayey gravels), mapped as a low permeability Palaeozoic sandstone/shale till. Gravel content increases with depth.

Bedrock underlying the majority of the application site belongs to the Glaspistol Formation, described as black mudstone and greywacke, laid down during the Silurian era as metasediments.

8.4.2 Aquifer classification

Figure 8-1 shows that bedrock beneath the site is classified as a poor aquifer, being generally unproductive except for local zones (Pl). Groundwater in these units is described as being restricted to the shallow, upper weathered zone which is generally less than 3 m thick, or along fault and fracture zones. These fault and fracture zones are typically confined to the upper 10 m and rarely extend below the upper 30 m of bedrock. Due to the low permeability and poor storage capacity, the bedrock aquifer has a low recharge acceptance. Some recharge in the upper, more fractured/weathered zone is likely to flow along the relatively short flow paths and rapidly discharge to streams, small springs and seeps.

To the south of the site bedrock is mapped as being a regionally important karstified aquifer (Rkd). The nearest mapped karst features are 550 m to the southwest, which include a spring, two swallow holes and epikarst.

8.4.3 Groundwater Body

The site is within the Wilkinstown Groundwater Body (GWB) (GSI, 2004) which occupies the northeastern portion of the Boyne catchment, located north of Drogheda. The area is hilly in most areas except to the west. The GWB report presumes that the transmissivity of the rocks is low (< $6m^2/d$) and there is secondary evidence (drainage densities, dry weather flow values) that the storativity in the aquifer is also low.

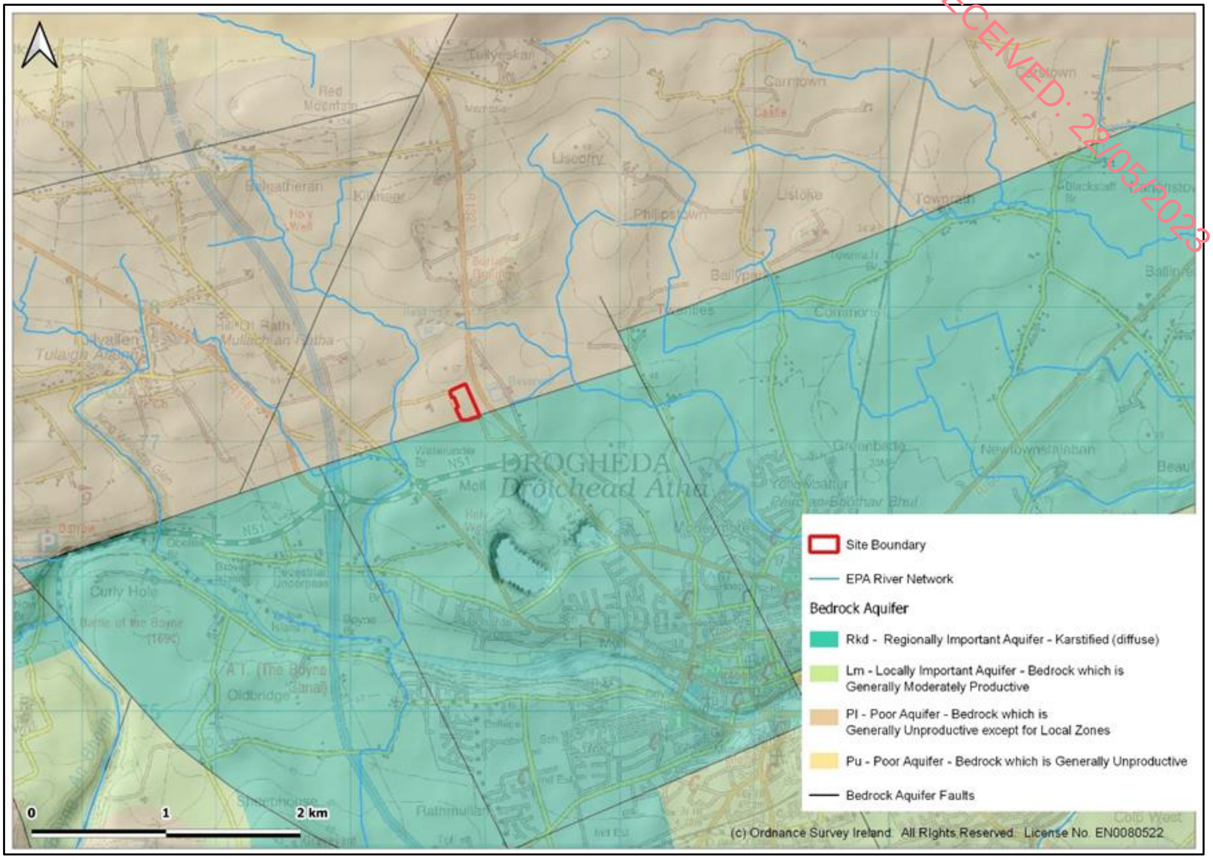

Figure 8-1 Bedrock Aquifer Classification

8.4.4 GSI Well Database

The GSI well database contains records for a number of wells in the area, though few of these are considered close enough to inform hydrogeology at the site. Nearby wells of interest are as follows:

1. 740 m northeast – 12.2 m deep agricultural and domestic well, abstraction = 110 m^3/d;
2. Approximately 500 m southwest – 42.7 m deep industrial well, depth to bedrock = 16.1 m; abstraction = 490 m^3/d

Historical maps do not show any springs or seeps in close proximity to the application site.

8.4.5 Groundwater Vulnerability

The vulnerability categories, and methods for determination, are presented in Groundwater Protection Schemes (GSI, 1999), and included below for reference (Table 8-1). The guidelines state that *'as all groundwater is hydrologically connected to the land surface, it is the effectiveness of this connection that determines the relative vulnerability to contamination. Groundwater that readily and* *quickly receives water (and contaminants) from the land surface is considered to be more vulnerable than groundwater that receives water (and contaminants) more slowly and in lower quantities. The travel time, attenuation capacity and quantity of contaminants are a function of the following natural geological and hydrogeological attributes of any area:*

1. *the subsoils that overlie the groundwater;*
2. *the type of recharge - whether point or diffuse;*
3. *the thickness of the unsaturated zone through which the contaminant moves.*

Table 8-1 Vulnerability Mapping Criteria (DELF/EPA/GSI, 1999)

Subsoil thickness	Hydrogeological Requirements				
	Diffuse Recharge			Point Recharge	Unsaturated Zone
	Subsoil Permeability & Type				
	High permeability (sand & gravel)	Moderate permeability (sandy subsoil)	Low permeability (clayey subsoil, clay, peat)	(Swallow holes, losing streams)	(sand & gravel aquifers only)
0-3m	Extreme	Extreme	Extreme	Extreme (30m radius)	Extreme
3-5m	High	High	High	N/A	High
5-10m	High	High	Moderate	N/A	High
>10m	High	Moderate	Low	N/A	High

Notes:
(i) N/A = not applicable
(ii) Permeability classifications relate to the material characteristics as described by the subsoil description and classification method

In general subsoils within the area are deep. As shown in Figure 8.2, the GSI has assigned the application site as having a classification of Low vulnerability. In accordance with the above criteria this infers depth to bedrock is greater than 10 m.

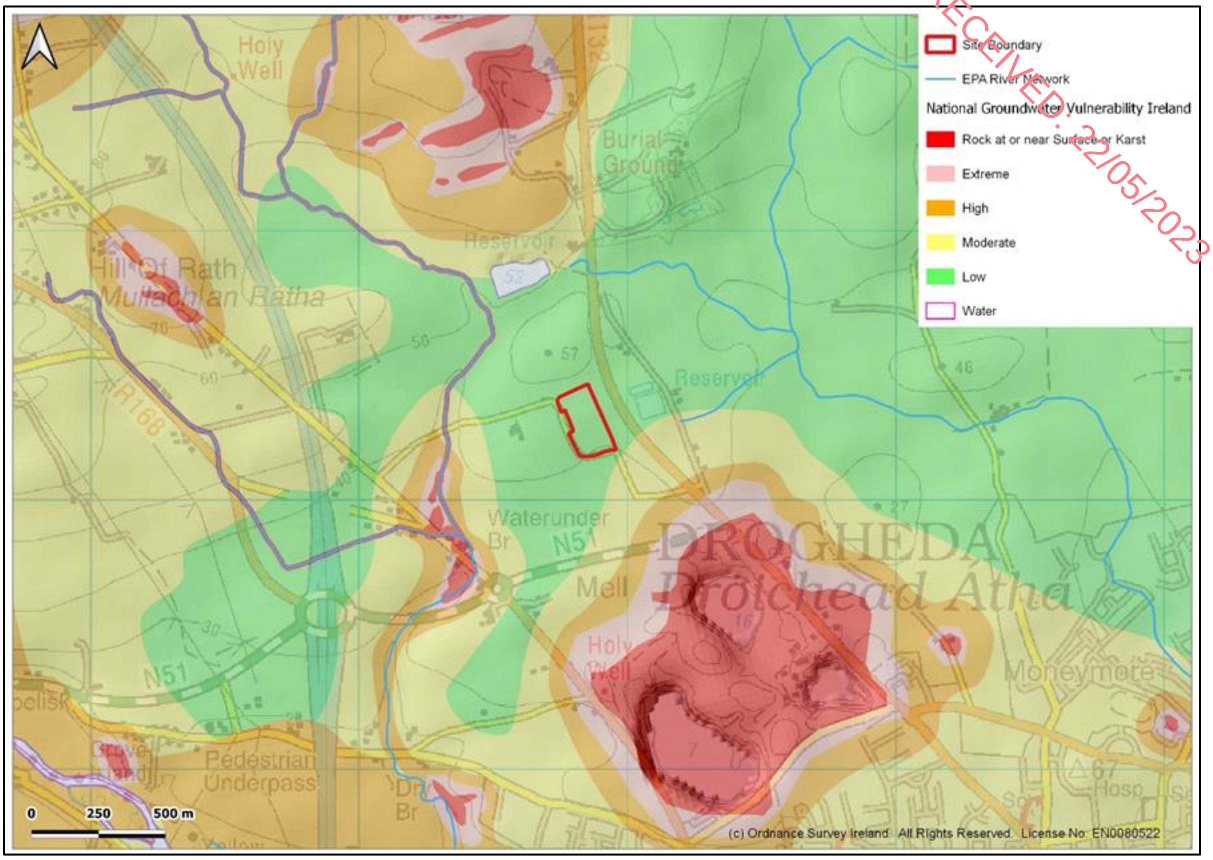

Figure 8-2 Groundwater Vulnerability

8.4.6 Source Protection Areas (SPA)

Groundwater in the surrounding region is utilised by several public water supply schemes (see Figure 8-3). These include:

- Killineer PWS – The Killineer supply borehole is positioned 1.6 km north of the northern site boundary. The SPA serving Killineer extends south from the source borehole, coming to within 1.6 km of the northern site boundary. This is a small scheme supplying a small estate of houses and the source protection report for this PWS (GSI, 2011) states that the scheme abstracts only 5 m^3/d from the bedrock aquifer.
- Ballymakenny PWS – The Ballymakenny scheme is supplied by 3 boreholes, assumed to be deeper than 50 m, and located 2.3 km east of the site. In 2010 the average abstraction was just under 1,000 m^3/d and with network improvements this was expected to fall further to 600 m^3/d. The SPA is large and comes to within 60 m of the eastern site boundary. The mapped SPA is sized for an abstraction rate of 1,100 m^3/d. The groundwater flows are understood to be heavily influenced by structural faulting.
- Drybridge PWS – The Drybridge supply is sourced from a single 45 m borehole, positioned 1.3 km southwest of the site. The scheme abstracts 275 m^3/d. The borehole abstracts

groundwater from karstified limestone and the borehole log showed karst cavities were encountered during drilling. It has been noted that the Drybridge Stream sinks and resurges in close proximity to the borehole. Hence the main body of the SPA, which comes to within 150 m of the western boundary application site, has been extended to include local watercourses, include the Mell Stream and its tributaries.

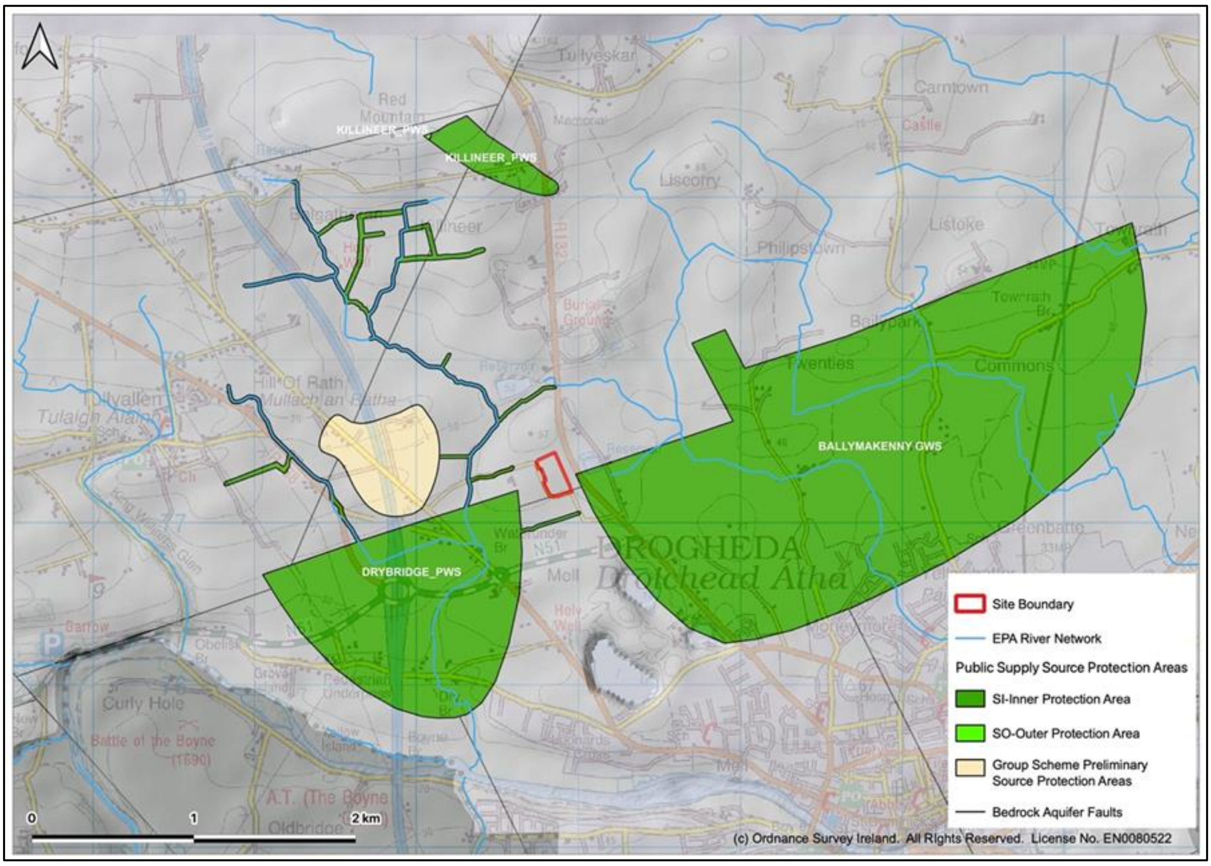

Figure 8-3 Source Protection Areas to Public Water Supply Schemes

Climatic data

Monthly rainfall data taken from a 1 km grid was sourced from Met Éireann (Walsh, 2012) and is presented in Table 8-2.

Table 8-2 Long term (1981-2010) mean monthly rainfall data (mm) (Met Éireann)

J	F	M	A	M	J	J	A	S	O	N	D	*Annual mm/yr*
74	56	60	60	65	63	57	75	64	88	78	78	816

Average annual potential evapotranspiration (PE) rate for Dublin Airport is provided by Met Eireann as 539 mm/yr across the period 2020–2022. Actual evapotranspiration (AE) is estimated by multiplying PE by 0.95, to allow for the reduction in evapotranspiration during periods when a soil moisture deficit is present. Actual evapotranspiration is therefore 512 mm/yr (0.95 PE).

The Effective Rainfall (ER) for the site, using Met Eireann AAR data, is determined as follows:

ER = AAR – AE = 816 mm/yr – 512 mm/yr = 304 mm/yr = 0.304 m/yr

For comparative purposes, the GSI map (https://dcenr.maps.arcgis.com/) indicates that Effective Rainfall (ER) is 354.8 mm/yr at the proposed development site.

The proposed development site has an area of 3.302 ha. (Development site area is based on actual area to be developed and is slightly less than area within the red line boundary). Hence, the total volume of water from precipitation that is potentially available for runoff or recharge is given by:

Site area runoff-recharge: = area x ER

= 33,020 m^2 x 0.304 m y^{-1}

= 10,038 m^3 yr^{-1} (27.50 m^3 d^{-1})

8.4.7 Recharge

Recharge coefficients can be utilised to estimate the proportion of water infiltrating to bedrock, against that moving laterally as shallow subsurface flow and surface overland flow.

The recharge coefficient applicable to the site which is in greenfield condition, where groundwater vulnerability is Low and a low permeability till greater than 10 m in thickness is overlain by poorly-drained soils, is 7.5% (as per the Recharge Coefficient Calculation Method developed by the Geological Survey of Ireland). Using this recharge coefficient, the average recharge at the site is 22.8 mm yr^{-1}. Within the greenfield area to be developed the volume of recharge generated by precipitation currently delivered to bedrock head can thus be estimated as:

Annual Recharge to Bedrock Head = (area x ER) x recharge coefficient

= (32,700 m^2 x 0.3040 m y^{-1}) x 0.075

= 745.5 m^3 yr^{-1} (2.04 m^3 d^{-1})

The GSI apply a recharge cap to the underlying poorly productive aquifer (Pu) whereby the maximum recharge to the bedrock aquifer has been assigned as 100 mm yr^{-1}.

Annual Recharge to Bedrock Aquifer = area x 0.1 m yr^{-1}

$$= 32{,}700 \text{ m}^2 \times 0.1 \text{ m yr}^{-1}$$

$$= 3{,}270 \text{ m}^3 \text{ yr}^{-1} (8.96 \text{ m}^3 \text{ d}^{-1})$$

The amount invoked by the recharge cap is greater than the actual calculated recharge, hence it is dismissed. It is assumed that all recharge (746 m^3/yr) penetrating the subsoil enters the bedrock aquifer. Any infiltrating groundwater rejected at bedrock head is likely to flow laterally through the upper weathered bedrock before discharging to local surface watercourses.

8.4.8 Water Framework Status (WFD) Status

The EPA web portal shows that WFD risk characterisation of the WIlkinstown groundwater body for 2016-2021 is given as ‘Not at Risk’.

The EPA web portal shows that Groundwater body WFD Status has been assigned as ‘Poor’ in terms of chemical status and ‘Good’ in terms of quantitative status within the groundwater body.

8.4.9 Surface Water Catchment

The site slopes predominantly from north to south, with the exception of the northernmost 50 m which slopes to the north. An open field drain is located adjacent to the southern site boundary. Rainfall-runoff generated on the south-sloping portion of the site enters this field drain, which directs water eastwards along the southern boundary before turning south, along the eastern side of the local road.

This open channel continues for a distance of approximately 135 m alongside the eastern margin of the local road before being culverted westwards beneath the local road. This road culvert was observed as having collapsed. It appears to have been a circular culvert with diameter of approximately 300 mm though this was difficult to confirm due to the collapsed condition and it being submerged.

At the downstream end of this culvert (western side of local road) waters merge with the outfall from an open drain on the western side of the local road (300 mm diameter culvert). Having merged, rainfall-runoff flows westwards before being culverted again within a short distance (5 m west of the local road) via a 0.5 m x 0.5 m box culvert. This short culvert serves as a field crossing. A brief schematic of this arrangement is shown in Figure 8-4.

Figure 8-4 Drainage arrangement beneath local road south of site

The local drainage network subsequently enters private agricultural lands and due to restricted access it proved difficult to observe the downstream routing between the local road culvert described above and the main channel of the Mell Stream. Based on aerial imagery two potential routes are presented in Figure 8.5: (i) the stream flows directly west and outfalls directly to the Mell Stream north of the N51/L6322 roundabout, or (ii) the stream flows south and enters N51 drainage infrastructure before entering the Mell Stream close to the N51/L6322 roundabout. In either scenario rainfall-runoff from the site is hydrologically connected to the Mell Stream.

Figure 8-5 Drainage network downstream of site

The northernmost (50 m) part of the site contains proposed car parking and proposed truck parking areas. Rainfall-runoff generated in this area is currently directed towards the stormwater infrastructure along the access road linking Chapel Lane to the R132.

A 65 m long open channel was noted in the northwestern corner of the site, appearing to emanate from one of the two adjacent residences. Aerial imagery suggests that this channel was installed in the period 2007 – 2011, possibly at the time of development of roads and infrastructural works mentioned at 8.3.1, possibly to capture rainfall-runoff flowing in a northwest direction. The channel falls in a northerly direction towards the stormwater infrastructure along the access road linking Chapel Lane to the R132. Surface water was observed in the channel but not flowing.

Engineering drawings prepared in 2008 shows that the existing stormwater infrastructure along the northern site boundary consists of a 225 mm pipe that falls from northeast to southwest. This pipe outfalls to the Mell Stream 450 m west of the site. Lands further to the north drain to a separate tributary of the Mell Stream.

The application site does not propose to connect to this drainage infrastructure. The contributing catchments to each of the routings discussed above have been inferred in Figure 8-6.

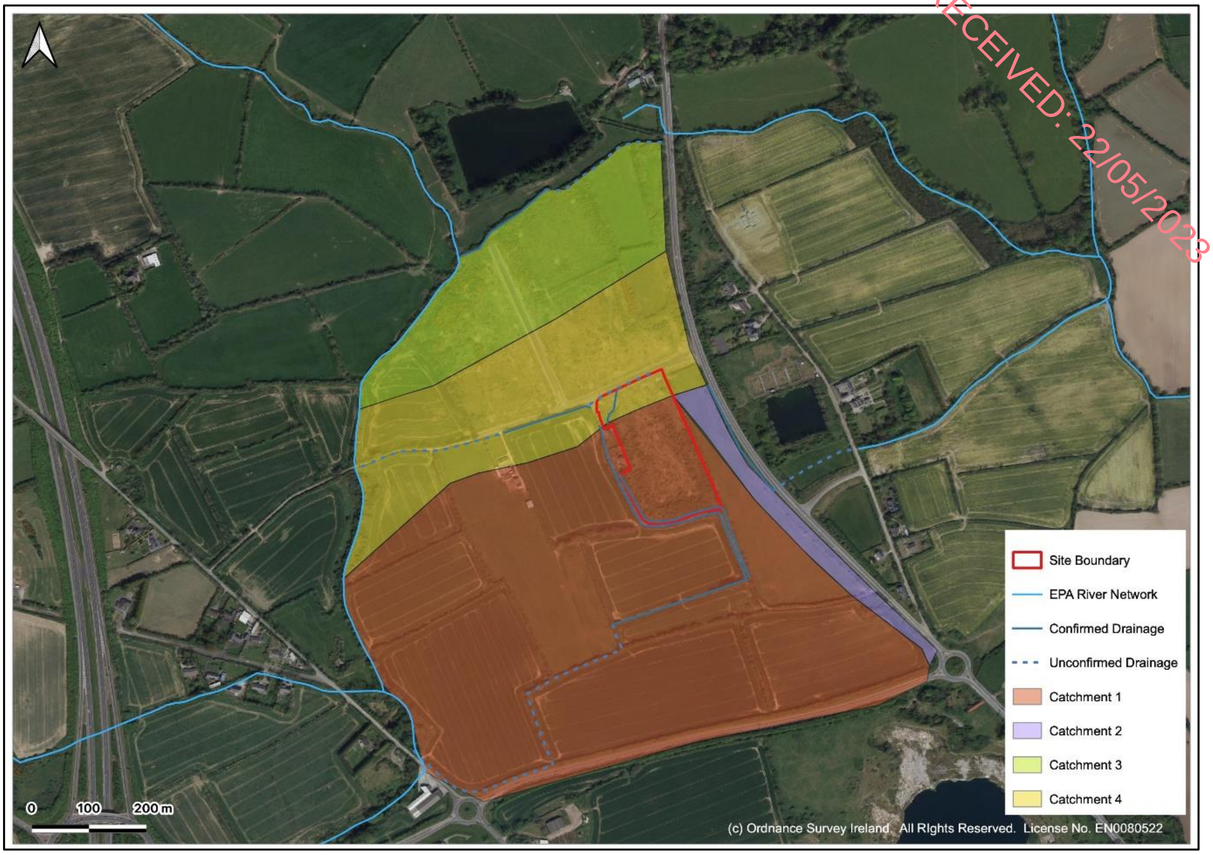

Figure 8-6 Estimated catchments of local channels

The Mell Stream (EPA Code: 07_1902) flows in a general southerly direction and outfalls to the River Boyne 1.75 km southwest of the site (as the crow flies). In terms of hydrological connectivity the River Boyne is 2.6 km downstream of the application site. Hence the application site is located within the Boyne catchment (HA07). The site does not appear to be hydrologically connected to the Yellowbatter River (EPA Code: 07Y04) which is mapped as flowing 250 meters to the east of the site.

8.4.10 WFD Status

For WFD purposes the Mell Stream is referenced by the EPA as the Tullyeskar_010 which is characterised by the EPA under WFD criteria as follows:

- WFD Risk 3rd Cycle = 'Under Review'
- River Significant Pressures = Agriculture & Urban Runoff
- Status = Moderate Status (2016 to 2021).

8.4.11 Biological Water Quality Status

The EPA has not carried out biological water quality monitoring on the Mell Stream.

8.4.12 Designated areas

The River Boyne & River Blackwater SAC (002299) is located 1.6 km from the application site, qualifying interests of which include river lamprey, salmon, otter, alluvial forests and alkaline fen. The Boyne Estuary SPA is 5 km downstream of where the Mell Stream outfalls to the River Boyne. The Boyne Coast and Estuary SAC and pNHA lies 5.6 km downstream of where the Mell Stream outfalls to the River Boyne.

8.4.13 Flood Risk

Historical Maps

Neither the historical 6" OSI maps dated c. 1830–1840 or 25" OSI maps dated c. 1888–1913 show any indicators of potential flooding within the site boundary or immediate vicinity.

OPW CFRAM Maps

The local section of the Mell Stream has been modelled in detail as part of the CFRAM programme. The CFRAM maps indicate that the site is not at risk of flooding.

OPW Historical Events

OPW mapping confirms that there are no known historical flood events at the site. The nearest mapped flood events are on the R168 approximately 800 metres south of the site.

Benefitting Lands

The Mell Stream is not maintained as part of an arterial drainage scheme hence there are no benefitting lands in the immediate vicinity of the site.

Flood Risk Summary

A brief desktop study has shown that there are no indicators to suggest that any part of the application site may be at risk of flooding. The siting of the proposed development is therefore considered to accord with the sequential approach set out within the Flood Risk Management Guidelines (OPW, 2009).

All rainfall-runoff generated in the northernmost part of the site will be disposed of via infiltration. Rainfall-runoff generated in the southern part of the site shall be attenuated and released to the open drain on the southern boundary at greenfield runoff rates. Hence the proposed activities will not increase flood risk elsewhere.

8.4.14 On-Site Wells

Six small diameter monitoring wells (MWs) were drilled on the lands to be developed as an IDA business park in March 2021. Two of these wells (BH5 and BH6) are within the application site (see Figure 8.7).

Summary details of the existing monitoring wells on the application site are presented in Table 8-3 below. Both were completed as groundwater monitoring wells by installing 50mm internal diameter HDPE screen and casing. The borehole annulus was backfilled with 6 mm to 10 mm graded gravels with a bentonite seal placed above the filter pack to prevent any downward migration of surface water. Raised lockable headworks set within a concrete plinth, which extended to 0.5 m below ground, completed the installation.

Figure 8-7– On-site groundwater monitoring wells

The positions and top-of-casing elevations of all wells were surveyed to Malin Head by Envirologic using RTK VRS technique. Lithology and well construction logs are included as Appendix 9.

Table 8-3 Groundwater level data

	BH5	BH6
Location		
Easting, m	706,749	706,800
Northing, m	777,378	777,242
Ground Level, mOD	48.388	41.253
Well diameter, m	0.05	0.05
Top of outer casing, mOD	48.527	41.676
Measured well depth, m	6.7	6.79
Base elevation, mOD	41.83	34.89
Bedrock head, mOD	n/a	n/a
Depth to GW, mbtoc 06/04/21	1.47	1.58
Groundwater level, mOD, 06/04/21	47.05	40.09
Depth to GW, mbtoc 25/11/22	0.65	1.23
Groundwater level, mOD, 25/11/22	47.87	40.45
Depth to GW, mbtoc 19/01/23	1.16	1.42
Groundwater level, mOD, 19/01/23	47.37	40.26

As construction works proceed it may not be possible to maintain BH5 and BH6 in their current position. Two new monitoring wells can be installed by way of a planning condition to facilitate future annual groundwater quality monitoring.

8.4.15 Third Party Wells

A third party well survey was not carried out as part of this assessment. In terms of inferred groundwater flow direction there are no residences downgradient of potentially contaminating site activities. There are no groundwater abstractions proposed at the development site hence there will be no potential impact to third party wells in terms of yield or groundwater levels.

8.4.16 Groundwater Level Survey

Resting groundwater levels were measured using a dip meter in April 2021, November 2022 and January 2023 (see Table 8-3). Seasonal groundwater levels were within a relatively narrow range of 0.82 m and 0.36 m at BH5 and BH6, respectively.

Due to restricted access and safety concerns it was not possible to measure groundwater levels in the nearby flooded quarry lagoons to the south.

8.4.17 Groundwater Flow Direction

Groundwater levels recorded in the six IDA monitoring wells on 19th January 2023 were used to generate a groundwater contour map (see Figure 8-8). The general groundwater flow direction is from north to south-southwest.

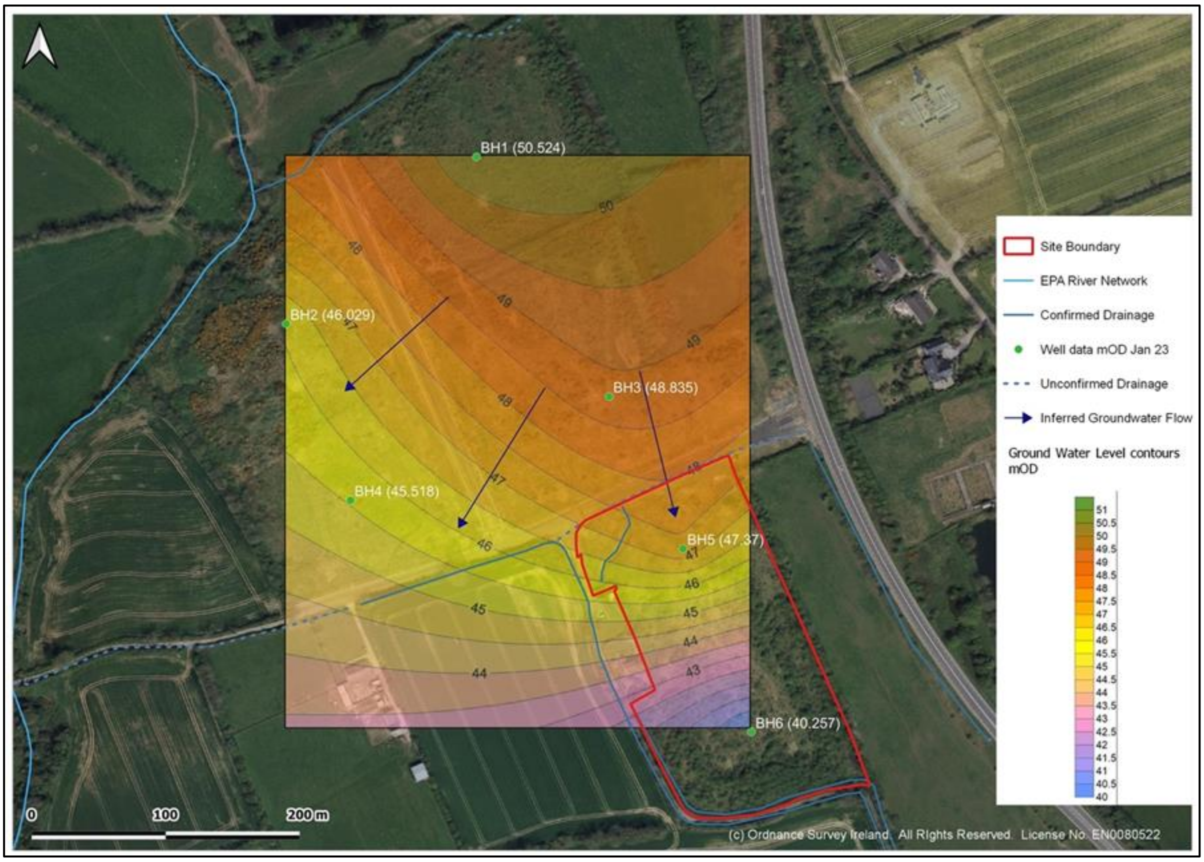

Figure 8-8 Groundwater Levels, Contours & Inferred Groundwater Flow Direction

8.4.18 Site-Specific Groundwater Vulnerability

Based on the borehole logs provided for the two boreholes at the site, neither encountered bedrock, meaning depth to bedrock is at least 6.7 m at the site. This confirms that groundwater vulnerability across the site is Moderate and with deeper lithology data is likely to be Low.

8.4.19 Groundwater Quality

Groundwater sampling was performed on 6th April 2021 on behalf of IDA and again on 25th November 2022 by Envirologic. Standard environmental low-flow sampling techniques were adopted to ensure the collected samples were representative of groundwater at each of the locations and to ensure integrity upon receipt at the laboratory. Results from groundwater sampling are shown in Table 8-4.

The monitoring round undertaken by Envirologic included field monitoring of unstable chemistry (including temperature, pH, electrical conductivity, oxidation/ reduction potential and dissolved oxygen) using a calibrated AquaTroll 600. Retrieved samples were stored in cooler boxes containing frozen ice packs together with completed chain-of-custody and delivered directly to ALS Environmental on same day as sampling. Laboratory certificates of analysis are included as Appendix 10.

Groundwater samples were analysed for a range of parameters which included metals, major ions, nutrients, microbiological suites and hydrocarbons.

8.4.20 Groundwater Quality Interpretation

Initial observation of unstable field chemistry parameters suggests that groundwater chemistry is slightly different at the upgradient end of the site (BH5) when compared to the downgradient end (BH6), with marginally higher conductivity and dissolved oxygen at the upgradient sampling point.

Iron and manganese concentrations, along with field dissolved oxygen content, confirm that groundwater is unconfined at this location.

All metals analysed were within guideline values. Exceedances were noted in potassium levels at the upgradient sampling point (BH5) on both sampling events though concentrations are relatively low, and the threshold values are based on testing water for human consumption. It is anticipated the process of dispersion would significantly reduce any potential risk posed to the groundwater abstractions from encountered potassium concentrations. This attenuation of dissolved potassium via dispersion is illustrated when we consider that BH6, located directly downgradient of BH5, has a dissolved potassium concentration an order of magnitude less than BH5 on both occasions, exhibiting a significant attenuation of dissolved potassium concentrations within the site boundary. The more recent sample satisfies threshold values for drinking water. Therefore, it is considered unlikely that potassium concentrations on-site pose a potential significant risk to groundwater or surface water receptors. There is no source of potassium on the application site and no record of historical activities, with the exception of agriculture, pre-2007.

Nutrient values are below threshold values and no hydrocarbons were detected. Faecal coliforms were detected at the downgradient sampling point in the 2022 sample. This was compared to no detections at the upgradient well. The potential source of coliforms within the site is unconfirmed.

Table 8-4 – Groundwater quality results

	Units	BH5	BH6	BH5	BH6	Drinking Water Regs (SI 278 of 2010)	Groundwater Regulation Threshold Values (2010, as amended 2016) *
Date		06/04/21		30/11/22			
Temperature	°C			10.7	11.1		
Field Electrical Conductivity	µS/cm			486	331		800 - 1875
Field pH				8.7	8.6	6.5 – 9.5	6.5 – 9.5
Field DO	mg/l			10.5	5.4		Not specified
Field Redox Potential	mV			217	169		
Aluminium	µg/l	<10	<10				150
Arsenic	µg/l	2.57	<0.5	3.5	0.89		
Boron	µg/l	28.5	17.7				
Cadmium	µg/l	<0.08	<0.08				3.75
Chromium	µg/l	<1	<1	<2	<2	50	37.5
Copper	µg/l	1.73	0.367	<9	<9		
Iron (total)	µg/l			<230	<230		
Lead	µg/l	<0.2	<0.2	<6	<6		
Magnesium	mg/l			4.52	6.97		
Manganese (total)	µg/l			117	18.1		
Mercury	µg/l	<.01	<.01			1	0.75
Nickel	µg/l	0.926	<0.4	4.75	<3		
Zinc	µg/l	1.7	2.11	<18	<18		75
Potassium	mg/l	61.2	6.7	18.7	2.71	5	Not specified
Sodium	mg/l	6.76	5.82			200	150
Sulphate	mg/l	7.8	8.2	<4.4	28.1	250	187.5
Chloride	mg/l	<0.5	<0.5	9.4	16.4	250	187.5
Fluoride	mg/l	<0.5	<0.5	0.2	0.3	1	
Bromide	mg/l	<0.06	0.0747				

Nitrate (NO_3)	mg/l	9.23	0.794	<3.1	<3.1		37.5
Nitrite (NO_2)	mg/l	<0.05	<0.05	<0.26	<0.26	0.05	0.375
Ammoniacal Nitrogen as N	mg/l	<0.2	<0.2	<0.06	<0.06	0.23	0.065 to 0.175
Nitrogen, Total as N	mg/l			0.9	0.5		
Orthophosphate as P	mg/l			0.81	0.05		Not specified
Phosphorus, Total as P	mg/l			0.89	<0.12		Not specified
Total TPH	µg/l	<0.01	<0.01	<10	<10		7.5 ug/l TV ^
Total Suspended Solids	mg/l			39	18		Not specified
BOD + ATU	mg/l			<2	<2		Not specified
Total coliforms	MPN/ 100 ml			5	276	0	Not specified
Faecal coliforms	MPN/ 100 ml			0	17	0	Not specified

* threshold values relevant to an assessment of the general quality of groundwater in a groundwater body in terms of whether its ability to support human uses has been significantly impaired by pollution. Where this threshold was not stated, that relevant to an assessment of inverse impacts of chemical inputs from groundwater on associated surface water bodies.

8.5 Impacts of the development

The procedure for determination of potential impacts on the receiving water environment was to identify potential receptors within the site boundary and surrounding environs and use the information gathered during the desk study and site investigation works to assess the degree to which these receptors will be impacted upon. In accordance with Table 3.4 of the current EIAR guidelines (EPA, 2022) impacts are discussed in terms of quality, significance, extent and context, probability, duration and frequency, and type of effect.

In addition Table 8-5, Table 8-6 and Table 8-7 below make reference to the IGI Guidelines (as included in 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (IGI, 2013)), from which groundwater is deemed to be an attribute of High importance as a function being in close proximity to a locally important potable water source supplying >1000 homes. With respect to hydrology the attribute is considered to be of High importance given its potential hydrological connectivity to the Drybridge source protection area and designated areas. Using the above criteria the impacts have been presented in Table 8-8.

Table 8-5 Criteria for assessing importance of hydrogeological site attribute (IGI,2013, Table C3)

Importance of	Criteria	Example
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation, e.g. SAC or SPA status
Very High	Attribute has a high quality, significance or value on a regional or national scale	Regionally important aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – NHA status
High	Attribute has a high quality, significance or value on a local scale	Regionally important aquifer. Groundwater provides large proportion of base flow 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
Medium	Attribute has a medium quality, significance or value on a local scale	Locally important aquifer. Potable water source supplying >50 homes
Low	Attribute has a low quality, significance or value on a local scale	Poor bedrock aquifer. Potable water source supplying < 50 homes

Table 8-6 Criteria for assessing magnitude of impact to hydrogeological receptor (IGI, 2013, Table C4)

Impact type	Magnitude of impact	Example
Adverse	Negligible	**No measurable changes in attributes** **Calculated risk of serious pollution incident <0.5% annually**
	Small	Removal of small proportion of aquifer Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >0.5% annually.
	Moderate	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 runoff Calculated risk of serious pollution incident >1% annually
	Large	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 runoff Calculated risk of serious pollution incident >2% annually
Beneficial	Minor	Minor enhancement of aquifer

	Moderate	Moderate enhancement of aquifer
	Major	Major enhancement of aquifer

Table 8-7 Criteria for assessing importance of hydrological site attribute (NRA, 2008, Box 4.2)

Importance of	Criteria	Example
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality, significance or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status Regionally important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Flood plain protecting more than 50 residential or commercial properties from flooding Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality, significance or value on a local scale	Salmon fishery Locally important potable water source supplying >1000 homes Quality Class B (Biotic Index Q3-4) Flood plain protecting between 5 and 50 residential or commercial properties from flooding Locally important amenity site for wide range of leisure activities.
Medium	Attribute has a medium quality, significance or value on a local scale	Coarse fishery Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2- 3) Flood plain protecting between 1 and 5 residential or commercial properties from flooding.
Low	Attribute has a low quality, significance or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding Amenity site used by small numbers of local people.

The matrix in Table 8-8 determines the significance of the impacts based on the site importance and magnitude of the impacts as determined by Table 8-5, Table 8-6 and Table 8-7. Based on hydrological and hydrogeological attributes being of High importance the magnitude of impact is deemed to be negligible, hence the, the significance of the impacts to hydrogeological and hydrological receptors is deemed to be imperceptible.

Table 8-8 Criteria for Rating Significance of Environmental Impacts (IGI, 2013)

Importance of Attribute	Magnitude of impact			
	Negligible	**Small**	**Moderate**	**Large**
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/significant	Profound
High	Imperceptible	Moderate/slight	Significant/moderate	Severe/significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/moderate

8.5.1 Construction stage

The proposed development involves construction of a new building, installation of surrounding hardstanding yard, a gravel yard area, a new car park, internal access roads and other associated infrastructure. Subsurface stormwater attenuation and interceptors will also be put in place.

Direct impacts

The type of primary direct impacts to the water environment during construction phase are:

1. Contamination of surface waters with particulate matter from disturbance of soil and subsoil at the site. The effect of this is considered to be adverse, slight (as a function of being a temporary (1-7 years) impact on an attribute of High importance), potentially affecting 1 km of downstream bed substrate.
2. Contamination of surface waters with hydrocarbons resulting from mobile refuelling of plant and machinery. The effect of this is considered to be adverse, slight (as a function of being a short-term impact (1-7 years) on an attribute of High importance), potentially affecting 1 km of downstream bed habitat, but unlikely providing adequate mitigation measures are implemented.
3. Contamination of surface waters with cementitious materials from the installation of concrete foundations, concrete hardstanding and sub-surface concrete drainage infrastructure. The effect of this is considered to be adverse, slight (as a function of being a temporary impact (1-7 years) on an attribute of High importance), potentially affecting 1 km of downstream bed habitat, but unlikely providing adequate mitigation measures are implemented.

4. Contamination of bedrock aquifer, from potential leaching of the above contaminants. The effect of this is considered to be short-term, adverse, slight, potentially affecting < 500 m given the poor aquifer type. No private well supplies were identified downgradient of the proposed development area. Any effect is considered unlikely providing adequate mitigation measures are implemented.

The above effects are limited to the duration of the construction phase which is expected to be 12-24 months.

Indirect impacts

Indirect impacts (or secondary impacts) are those which are not a direct result of the proposed activity, often produced away from the project site or because of a complex pathway. There were no indirect impacts to the hydrological and hydrogeological environment identified during the construction phase impact assessment.

Operational stage

In addition to the impacts due to the installation of long-term structures there will be change in use on site from greenfield to industrial.

Direct impacts

The primary direct impacts to the water environment during the operational phase are:

- Increase in risk of contamination of groundwater. All galvanising activities involving harmful chemicals take place indoors. Impacts to groundwater from indoor processes are considered to be neutral, imperceptible, not extending beyond the areal confines of the building, unlikely, and short-term.
- Contamination of surface waters with sediment or hydrocarbons during the operational phase resulting from washdown and/or surface water runoff within external storage areas that can migrate to the on-site drainage network and downstream receiving waters. The effect of this is considered to be adverse, moderate, potentially affecting 1 km of downstream bed substrate, short-term, but unlikely providing adequate mitigation measures are implemented.
- Reduction in recharge due to increased hardstanding. This effect is considered to be adverse, long-term, likely, but limited to a radius of less than 500 m of the underlying groundwater aquifer. There is no groundwater abstraction proposed. Infiltration of rainfall-runoff will be utilised where feasible. Given the low recharge coefficient when in greenfield condition the effect on baseflows and groundwater supplies will be imperceptible.

- Increase in surface water flows with associated increase in flood risk to downgradient receptors. This effect is considered to be adverse, slight by way of lack of vulnerable receptors downstream, affecting the Mell Stream and tributary, momentary during intense rainfall events, but unlikely providing adequate mitigation measures are implemented.
- Intense rainfall may give rise to increased runoff, which in turn can increase potential for sediment mobilisation. Mitigation measures during the construction and operational phases are designed to control loss of sediment. Hence any increase in sediment-laden runoff will be contained within the site.

Groundwater monitoring results to date show that groundwater underlying the site is of good quality (the only exceedance being potassium at BH5). The potential pathways connecting proposed activities and groundwater beneath the site are:

- disposal of rainfall-runoff in the northern portion of the site by infiltration. This recharge is merely redirected rainfall. This area predominantly accommodates parking which is deemed to be of low risk with respect to contamination.
- There will be some infiltration through gravel (hardcore) areas which may be used for storage of steel products. The treated (i.e. galvanised) materials are considered to be inert. The applicant will have procedures in place to ensure all imported (untreated) steel is appropriately clean and ready for processing. Recharge rates in these areas are very low, in the order of 7.5%, and the risk of contamination to the underlying aquifer is deemed to be imperceptible.

Indirect impacts

There were no indirect impacts to the hydrological and hydrogeological environment identified during the operational phase impact assessment.

Unplanned events

Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports indicates that EIARs should address unplanned effects as relevant (examples include accidents, spills, floods and fires). Directive 2014/52/EU further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned. The Directive gives examples of ‘flooding, sea level rise, or earthquakes’.

Direct impacts

Intense rainfall events with a return period greater than the design criteria (1 in 100 years) during the construction or operational phase may give rise to increased runoff and hence increased sediment mobilisation. Effects of intense rainfall events can be adverse, slight, and can affect the Mell Stream tributary. Mitigation measures during the construction and operational phases are designed to control loss of sediment. The concrete attenuation tank will promote settlement of solids. The full retention hydrocarbon interceptors to be installed each have a silt trap chamber. Hence any increase in sediment-laden runoff will be contained within the site.

Fire is considered to be an unplanned event. Effects can be adverse, slight-profound, and short-term, affecting the Mell Stream tributary. The hydrocarbon interceptors have shut-off valves to trap potentially contaminated fire-fighting water on-site. Potentially contaminated firewater can then be removed off-site for treatment if necessary. These measures reduce the probability of the effects occurring to unlikely.

Significant spillage is considered to be an unplanned event. All potentially harmful chemicals are contained within the processing shed. There is no route for potentially harmful chemicals to migrate outside the building. The effect of significant spillage is considered to be adverse, slight-profound, potentially affecting the Mell Steam tributary short-term but unlikely providing adequate mitigation measures are implemented.

Indirect impacts

There are no foreseen indirect impacts resulting from unplanned events.

8.5.2 Cumulative impacts

Effects arising in respect of existing developments are considered within the assessment of the receiving environment, and as such are considered cumulatively with the effects of the proposed development as set out in this Chapter.

In accordance with EIA legislation and Table 3.5 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (see Section 1.9 of Chapter 1), a search was undertaken for approved developments, but not yet built or operational, of relevance to the consideration of cumulative effects in respect of Water and none were identified.

With the exception of agriculture there are currently no activities in the immediate surrounds with potential to contaminate groundwater. Historical quarries in the area have been closed. Given the control measures to be implemented as part of the proposed works the cumulative impact in this regard is considered to be negligible.

Consideration is also given to the potential impact on the Mell Stream due to proposed activities occurring in combination with other activities in the area. Given the control measures to be implemented as part of the proposed works the cumulative impact on the Mell Stream is considered to be negligible.

8.5.3 'Do-nothing' impacts

This item requires consideration of the effect on the environment in the future should the proposed works not be carried out. If the proposed works are not carried out it would likely remain in an unused condition and the effects of the project on Water considered in this EIAR would not arise.

Table 8-9 Summary of potential impacts

Scenarios where impacts may arise	Activity	Attribute/ receiving environment	Importance of attribute/sensitivity of receiving environment	Nature of Effect (description)	Quality of Effect	Significance of Effect	Extent & Context of Effect	Probability	Duration	Type of Effect
Construction phase	Preparation of ground for hardstanding, foundations, attenuation and interceptors	Mell Stream	High	Direct: Silt-laden runoff from exposed soil/subsoil. The increased silt content in runoff has potential to degrade local surface water quality.	Adverse	Slight	1 km downstream Mell Stream	Likely without mitigation	Temporary	No indirect impacts; neglible cumulative impacts; Do-nothing effects see Section 8.5.2 Residual effects see Section 8.8.
	Storage of hydrocarbons; Leakages from machinery; Spillages during refuelling	Mell Stream / Aquifer	High	Direct: Runoff/infiltrating water may contain hydrocarbons	Adverse	Slight	1 km downstream Mell Stream; <500m downgradient aquifer	Unlikely	Temporary	
	Uncontrolled spillage of cementitious material	Mell Stream / Aquifer	High	Direct: Runoff/infiltrating water may contain highly alkaline, cementitious material	Adverse	Slight	1 km downstream Mell Stream; <500m downgradient aquifer	Unlikely	Temporary	
Operational phase	Flood risk from hardstanding/roof runoff	Mell stream	High	Direct: Increase in flood risk to local watercourses due to increase in hardstanding/roofs.	Adverse	Moderate	1 km downstream Mell Stream	Likely without mitigation	Momentary	t
	Silt-laden runoff from site activities	Mell stream	High	Direct: Increase in silt load to watercourses	Adverse	Moderate	1 km downstream Mell Stream	Unlikely	Short-term	

Scenarios where impacts may arise	Activity	Attribute/ receiving environment	Importance of attribute/sensitivity of receiving environment	Nature of Effect (description)	Quality of Effect	Significance of Effect	Extent & Context of Effect	Probability	Duration	Type of Effect
	Hydrocarbon contamination from machinery, trucks and cars.	Mell Stream/Aquifer	High	Direct: Potential for hydrocarbons to migrate to watercourses and/or aquifer	Adverse	Moderate	1 km downstream Mell Stream; <500m downgradient aquifer	Unlikely	Short-term	
	Washdown water	Mell Stream/Aquifer	High	Direct: Potential for contaminants to migrate to watercourses and/or aquifer	Adverse	Moderate	1 km downstream Mell Stream; <500m downgradient aquifer	Unlikely	Short-term	
	Increased hardstanding	Aquifer	High	Direct: Reduction in recharge	Adverse	Slight	<500m downgradient aquifer	Likely	Long-term	
	Stormwater discharge	Mell Stream/Aquifer	High	Direct: Connectivity to Drybridge SPA	Adverse	Moderate	Drybridge Source Protection Area	Unlikely	Short-	
Unplanned events	Intense rainfall events in excess of Q_{100}	Mell Stream/Aquifer	High	Direct: Potential for uncontrolled release of waters and potential contaminants	Adverse	Slight	1 km downstream Mell Stream; <500m downgradient aquifer	Unlikely	Momentary	No indirect impacts; negligible cumulative impacts; Do-nothing effects see Section 8.5.2; Residual effects see Section 8.8.
	Spillages or leakages of fuels/hydrocarbons	Mell Stream/Aquifer	High	Direct: Potential for contamination of surface waters and groundwater	Adverse	Slight-profound	1 km downstream Mell Stream. <500m downgradient aquifer	Unlikely	Short term	

Scenarios where impacts may arise	Activity	Attribute/ receiving environment	Importance of attribute/sensitivity of receiving environment	Nature of Effect (description)	Quality of Effect	Significance of Effect	Extent & Context of Effect	Probability	Duration	Type of Effect
	Uncontrolled release of firefighting water	Mell Stream/Aquifer	High	Direct: Potential for contamination of surface waters and groundwater	Adverse	Slight-Profound	1 km downstream Mell Stream; <500m downgradient aquifer	Unlikely	Short-term	

8.6 Mitigation measures

The significant potential impacts identified in Table 8-9 are resolved under the mitigation measures set out underTable 8-10.

Best practice will be implemented at all times in relation to any activities that may impact on surface water. Comprehensive surface water management measures (GDSDS study recommendation) must be implemented at the construction and operational stage to prevent any pollution of local surface waters.

The following primary measures relating to water will be implemented as part of the development:

1. During construction phase silt fences will be installed to ensure no suspended solids or deleterious material emanating from temporary stockpiles of topsoil on site will enter the surface water network. Temporary stockpiles shall be located at least 15 m from drainage systems and covered.
2. Installation of new attenuation systems to capture water from roof of new building and new hardstanding apron. Stormwater flow rates will be restricted to greenfield runoff rates during extreme rainfall events, thereby preventing any potential increase in flood risk. This will (i) protect downgradient watercourses and other receptors against increased flood risk, (ii) increase stormwater treatment efficiencies in terms of sediment and hydrocarbon removal by providing a balanced inflow rate to same.
3. Installation of new infiltration device to dispose of rainfall-runoff generated on cark park internal access roads, truck parking area. This will eliminate potential hydrological connectivity between runoff generated on the northern part of the site and the Mell Stream.
4. Following development works all stormwater crossing the site boundary will pass through silt and hydrocarbon interceptors. A shut off valve will be fitted to the outlet of each interceptor/attenuation device in order to manually contain a significant spill. Contained spillage will be assessed for suitable disposal.
5. Implement necessary control measures for silt and hydrocarbon contamination. This will include full servicing of interceptors and infrastructure, cleaning out silt traps, cleaning out stormwater gullies, regular maintenance and inspection.
6. Compliance with IFI document ‘Guidelines on protection of fisheries during construction works in and adjacent to waters’ (IFI, 2016).
   - All yard surfaces will be inspected regularly for imperfections or areas where infiltration to underlying overburden may occur. Any areas where structural integrity of concrete is in doubt shall be repaired immediately.

- Used firefighting water which may be potentially contaminated will be contained within the site via shutoff valves at the hydrocarbon interceptors/attenuation device. Used firefighting water used on the main building shall be stored in the new attenuation device. Contained firefighting water will be assessed for suitable disposal.

At a distance of 125 m southeast of the southern site boundary the tributary of the Mell Stream is deemed to be within the Source Protection Area serving Drybridge Public Water Supply Scheme (PWSS). Implementation of the mitigation measures outlined in

- Table 8-10 will ensure that there will be no increase in runoff rates leaving the site, when compared to existing greenfield runoff rates, and that there will be no impacts to surface water quality. Hence the proposed development works will have no impact on this public drinking water source.

Table 8-10 Summary of mitigation measures

Scenarios where impacts may arise	Potential Impact			Mitigation measure	Residual effect (following mitigation)	
	Activity	Attribute/ receiving environment	Nature of effect/ description	Description	Significance or quality of potential impact	Probability of potential impact
Construction phase	Preparation of ground for hardstanding, foundations, attenuation and interceptors	Mell Stream	Silt-laden runoff from exposed soil/subsoil. The increased silt content has potential to degrade local surface water quality.	Excavations at the site shall be clearly defined and restricted to the stated areas. Excavated overburden will remain exposed for as little time as possible. Topsoil stripping will be restricted to the minimum area required for efficient earthworks operation. Working contours will ensure no surface waters leave site in an uncontrolled manner. Any stockpiles shall be covered and located over 15 m from drainage channels. Any stormwater leaving the construction area shall pass through a temporary settlement pond before entering the local surface water network. A silt fence shall surround the perimeter of the working area. Maintain a vegetated margin of at least 10 m around the working area where possible.	Imperceptible	Unlikely
	Storage of hydrocarbons; leakages from machinery; spillages during refuelling	Mell Stream / Aquifer	Runoff/infiltrating water may contain hydrocarbons	All potentially contaminating substances to be stored in designated areas away from excavation areas, isolated from gullies, open channels or exposed overburden. Hazardous wastes such as waste oil will be stored in sealed containers. Refuelling, lubrication and storage areas will be in a designated area, not within 30 m of surface waters. All fuel and waste containers will be stored within a secondary containment system (e.g. a bund for static tanks or a drip tray for mobile stores and drums). The bunds shall be capable of storing 110% of tank capacity, plus a minimum 30 mm rainwater allowance where the bund is uncovered. Where more than one tank is stored, the bund must be capable of holding 110% of the largest tank or 25% above the aggregate capacity. Drip trays used for drum storage must be capable of holding at least 25% of the drum capacity.	Imperceptible	Unlikely

Scenarios where impacts may arise	Potential Impact			Mitigation measure	Residual effect (following mitigation)	
	Activity	Attribute/ receiving environment	Nature of effect/ description	Description	Significance or quality of potential impact	Probability of potential impact
				Regular monitoring of water levels within drip trays and bunds due to rainfall will be undertaken to ensure sufficient capacity is maintained at all times. An adequate supply of spill kits and hydrocarbon absorbent packs shall be stored on site and must be utilised if leakages or minor spillages are observed.		
	Uncontrolled spillage of cementitious material	Mell Stream / Aquifer	Runoff/infiltrating water may contain highly alkaline cementitious material	All ready-mixed concrete shall be delivered to site by truck. A suitable risk assessment for wet concreting shall be completed prior to works being carried out. Washdown and washout of concrete trucks, with the exception of the chute, will take place at an appropriate facility off-site. There will be no hosing into surface drains or gullies of spills of concrete, cement, grout or similar materials. Such spills shall be contained immediately and runoff prevented from entering the drainage network. Given the significant amount of concrete to be laid on site, if the concrete contractor insists that trucks are washed out on site, then washings from such shall pass through a temporary settlement tank with pH correction. Concrete shall only be poured in pre-determined target locations.	Imperceptible	Unlikely
Operational phase	Flood risk from hardstanding runoff	Mell Stream	Increase in flood risk to local watercourses due to increase in hardstanding/roofs	Rainfall-runoff generated on the new car parking area, truck parking area and internal access road shall be disposed of to ground via a new infiltration area and permeable paving. A new subsurface attenuation tank shall be installed to withhold runoff generated on main building and concrete apron during extreme rainfall events. The attenuation tank shall be fitted with a hydrobrake to restrict release of stormwater to pre-development greenfield runoff rates.	Imperceptible	Unlikely

Scenarios where impacts may arise	Potential Impact			Mitigation measure	Residual effect (following mitigation)	
	Activity	Attribute/ receiving environment	Nature of effect/ description	Description	Significance or quality of potential impact	Probability of potential impact
				These Sustainable Urban Drainage Systems (SuDS) shall be implemented to control all runoff leaving the site at pre-development greenfield runoff rates.		
	Silt-laden runoff from site activities	Mell Stream	Increase in silt load to watercourses.	Two new hydrocarbon interceptors are proposed to treat rainfall-runoff generated on hardstanding areas. The interceptors are capable of collecting silt mobilised in rainfall-runoff.	Imperceptible	Unlikely
	Hydrocarbon contamination from machinery, trucks and cars	Mell Stream/Aquifer	Potential for hydrocarbons to migrate to watercourses and/or aquifer	Two new hydrocarbon interceptors are proposed to treat stormwater. These will outfall to the new infiltration area and the southern boundary drain. All potentially contaminating substances to be stored in designated areas away from excavation areas, isolated from gullies, open channels or exposed overburden. Hazardous wastes such as waste oil will be stored in sealed containers. Refuelling, lubrication and storage areas will be in a designated area, not within 30 m of surface waters. All fuel and waste containers will be stored within a secondary containment system (e.g. a bund for static tanks or a drip tray for mobile stores and drums). The bunds shall be capable of storing 110% of tank capacity, plus a minimum 30 mm rainwater allowance where the bund is uncovered. Where more than one tank is stored, the bund must be capable of holding 110% of the largest tank or 25% above the aggregate capacity. Drip trays used for drum storage must be capable of holding at least 25% of the drum capacity. Regular monitoring of water levels within drip trays and bunds due to rainfall will be undertaken to ensure sufficient capacity is maintained at all times.	Imperceptible	Unlikely

Scenarios where impacts may arise	Potential Impact			Mitigation measure	Residual effect (following mitigation)	
	Activity	Attribute/ receiving environment	Nature of effect/ description	Description	Significance or quality of potential impact	Probability of potential impact
				An adequate supply of spill kits and hydrocarbon absorbent packs shall be stored on site and must be utilised if leakages or minor spillages are observed. All chemicals used in the galvanising process shall be stored and used within the main building.		
	Washdown water	Mell Stream/Aquifer	Potential for contaminants to migrate to watercourses via stormwater network	Regular inspections to ensure integrity of hardstanding is not compromised. If any cracks or defections are observed then comprised area to be reinstated immediately. The newly proposed interceptors include appropriate capacity for silt entrapment. The main building isolates galvanising processes and potentially harmful substances from rainwater.	Imperceptible	Unlikely
	Increased hardstanding	Aquifer	Reduction in recharge	Recharge to the underlying bedrock aquifer shall be reduced where hardstanding and roof areas are installed. In the northern part of the site all rainfall-runoff will recharge to the aquifer via infiltration areas and permeable paving. In the southern parts of the site the infiltrations rates of underlying subsoil are low. The reduction in recharge in the southern part of the site is imperceptible given the scale of the aquifer.	Imperceptible	Unlikely
			Connectivity to Drybridge SPA	All stormwater leaving the site will pass through hydrocarbon interceptor which inludes appropriate capacity for silt entrapment.	Imperceptible	Unlikely

Scenarios where impacts may arise	Potential Impact			Mitigation measure	Residual effect (following mitigation)	
	Activity	Attribute/ receiving environment	Nature of effect/ description	Description	Significance or quality of potential impact	Probability of potential impact
	Intense rainfall events in excess of Q_{100}	Mell Stream/Aquifer	Potential for uncontrolled release of waters and potential contaminants	Installation of a new subsurface attenuation device will withhold runoff generated on hardstanding and roofs during extreme rainfall events. The attenuation device shall be fitted with a hydrobrake to restrict release of stormwater to pre-development greenfield runoff rates. Excess waters shall be contained within the concrete apron.	Imperceptible	Unlikely
	Spillages or leakages of fuels/hydrocarbons	Mell Stream/Aquifer	Potential for contamination of surface waters and groundwater	Two new hydrocarbon interceptors are proposed to treat stormwater. These will outfall to the new infiltration area and the southern boundary drain. Both the northern interceptor and the southern attenuation device shall be fitted with a shutoff valve. All potentially contaminating substances to be stored in designated areas away from excavation areas, isolated from gullies, open channels or exposed overburden. Hazardous wastes such as waste oil will be stored in sealed containers. Refuelling, lubrication and storage areas will be in a designated area, not within 30 m of surface waters. All fuel and waste containers will be stored within a secondary containment system (e.g. a bund for static tanks or a drip tray for mobile stores and drums). The bunds shall be capable of storing 110% of tank capacity, plus a minimum 30 mm rainwater allowance where the bund is uncovered. Where more than one tank is stored, the bund must be capable of holding 110% of the largest tank or 25% above the aggregate capacity. Drip trays used for drum storage must be capable of holding at least 25% of the drum capacity. Regular monitoring of water levels within drip trays and bunds due to rainfall will be undertaken to ensure sufficient capacity is maintained at all times. An adequate supply of spill kits and hydrocarbon absorbent packs shall be stored on site and must be utilised if leakages or minor spillages are observed. All chemicals used in the galvanising process shall be stored and used within the main building.	Imperceptible	Unlikely

Scenarios where impacts may arise	Potential Impact			Mitigation measure	Residual effect (following mitigation)	
	Activity	Attribute/ receiving environment	Nature of effect/ description	Description	Significance or quality of potential impact	Probability of potential impact
	Uncontrolled release of firefighting water	Mell Stream/Aquifer	Potential for contamination of surface waters and groundwater	Both the northern interceptor and the southern attenuation device shall be fitted with a shutoff valve. In the event of a fire the shutoff valves will be closed immediately. Used firefighting water generated in the southern part of the site shall be contained within the attenuation tank.	Imperceptible	Unlikely

8.7 Monitoring measures

All personnel working on the site shall be trained in the implementation of the procedures. As a minimum, the manual will be formulated in consideration of the standard best international practice including but not limited to:

- CIRIA, 2011. Control of Water Pollution from Construction Sites, Guidance for Consultants and
- CIRIA, 2005. Environmental Good Practice on Site (C650);
- BPGCS005. Oil Storage Guidelines;
- CIRIA, 2007. The SuDS Manual (C697);
- Environment Agency, 2004. UK Pollution Prevention Guidelines (PPG).

During the construction and operational phases hydrocarbon and silt interceptors will be serviced and maintained on a regular basis by an independent licensed contractor. Regular inspections of the site infrastructure (hardstanding, drainage infrastructure, etc.) shall also be undertaken by a designated person.

The following monitoring regime is proposed. Annual monitoring shall take place at 3 locations:

1) Upgradient monitoring well
2) Downgradient monitoring well
3) Surface water outfall to tributary of Mell Stream on southern site boundary.

Parameters shall be as per analysis carried out in November 2022. Designated sampling points shall be agreed with the local authority.

8.8 Residual impacts

Residual impacts refer to the degree of environmental change that will occur after the proposed mitigation measures have taken effect.

Assuming implementation of the mitigation measures described in

Table 8-10, the residual impacts on the hydrological and hydrogeological environment during the operational phase are assessed to be long-term and negligible.

8.9 Interactions with other impacts

The EIAR guidelines (EPA, 2022) highlight that the interaction of impacts to water environment, arising from proposed activities, must be given due consideration alongside potential receptors identified in other EIAR sections. The likely interactions have been identified as follows:

- During the construction and operational phases activities within the site boundary can result in mobilisation and transport of sediment within rainfall-runoff generated on hardstanding. Without mitigation there is potential for this sediment-laden water to migrate across the site boundary and enter a tributary of the Mell Stream which ultimately outfalls to the River Boyne and River Blackwater SAC, Boyne Estuary SPA, Boyne Coast and Estuary pNHA and Boyne Coast and Estuary SAC. The loss of sediment to local surface waters may have an adverse impact on the physical nature of aquatic habitats.
- During the construction and operational phases activities across the site can result in mobilisation and transport of hydrocarbons or cementitious material (construction phase only). Without mitigation these contaminants can migrate across the site boundary and enter a tributary of the Mell Stream which ultimately outfalls to the River Boyne and River Blackwater SAC, Boyne Estuary SPA, Boyne Coast and Estuary pNHA and Boyne Coast and Estuary SAC. The loss of hydrocarbons or cementitious material may have an adverse impact on aquatic flora and fauna.

Each of these issues and the mitigation measures proposed are addressed in detail in the relevant sections of this EIAR. These impacts are considered to be negative but with suitable mitigation measures in place, their impact can be reduced.

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9 TRAFFIC & TRANSPORTATION

9.1 Introduction

This assessment was prepared by Mr Aly Gleeson and Mr Antonis Papadakis of PMCE Ltd. which is a civil engineering consultancy based in Co. Dublin, and specialises in Transport and Road Safety Engineering. PMCE Ltd. has been commissioned to undertake a review of the traffic impacts associated with the proposed Galvanising Facility at Mell, Drogheda, Co. Louth.

Aly Gleeson is a Chartered Civil Engineer, Fellow of Engineers Ireland, and a Director of PMCE with over 20 years' post-graduate experience. His engineering background includes delivery of major international projects, local authority safety schemes, bus & cycle projects, and residential developments. Aly has developed his background in engineering to include Traffic and Transport Assessments, Design projects and Road Safety Audits. This has involved working with large construction clients, specialised design consultancy's, local authorities, and Transport Infrastructure Ireland.

Antonis Papadakis is a Project Engineer with PMCE specialising in Traffic and Transportation Engineering. Antonis' has experience in both Traffic Modelling and Junction Capacity Analysis following extensive work on a variety of traffic projects. His traffic engineering background includes a variety of projects such as quarries, mines, hotels, residential, commercial and community developments.

No difficulties were encountered in preparing this chapter.

9.2 Methodology

9.2.1 Information Reviewed

In preparing this Traffic chapter, reference has been made to the following documents:

1. "Traffic and Transport Assessment Guidelines" (May 2014) published by the National Roads Authority (now Transport Infrastructure Ireland (TII))
2. Unit 5.3 (Travel Demand Projections) of the "Project Appraisal Guidelines" (2021) published by Transport Infrastructure Ireland
3. Traffic Count Survey Data, collected by Traffinomics
4. Unit 16.1 (Expansion Factors for Short Period Traffic Counts) of the "Project Appraisal Guidelines" (2016) published by Transport Infrastructure Ireland

5. Design Manual for Urban Roads and Streets (DMURS) published by the Department of Transport, Tourism and Sport and the Department of Housing, Planning and Local Government in May 2019
6. TII Publications document DN-GEO-03031, "Rural Road Link Design" (June 2017) published by Transport Infrastructure Ireland
7. TII Publications document DN-GEO-03060, "Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade-separated and compact grade-separated junctions)" (June 2017) published by Transport Infrastructure Ireland

9.2.2 Procedures for Completing Assessment

The methodology adopted for this appraisal involved, in brief: -

1. A site visit on the 16th of November 2022 at which time the weather was dry, and the ground surface was dry.
2. Trip Generation and Trip Assignment – This is used to derive trip rates for both the AM and PM Peaks and to provide information as to which direction of travel vehicles will travel to/from the proposed development.
3. Link Capacity Assessment - To obtain an AADT value for the main roads linking the development to the surrounding road network.
4. Junction Capacity Assessment – The traffic count data was used to develop Junctions 9 models for the assessed junctions.
5. Future Year Assessments – The estimated future year volumes on the study area network, as a result of the increase in background traffic and any site related traffic, was used to assess the future operational performance of the junctions and surrounding road network for 2022 (Base Year), 2023 (construction year 1), 2024 (construction year 2 and assumed year of opening) and at two future assessment years, the opening year +5 (2029) and the opening year +15 (2039)

9.2.3 Location

The subject site is located at Mell, Co. Louth, approximately 2.5km northwest of Drogheda town centre. The application site is within a larger landholding owned by the IDA and is accessed via part-built (currently closed) access road linking Chapel Lane (L6323) to the R132, which will be completed as part of the IDA's plans for the wider lands at this location (See Section 2.3.2). Figure 9-1 shows the location of the Site and surrounding area and Figure 9-2 shows the location of the junctions, in the vicinity of the Site, which have undergone a capacity assessment.

Lands surrounding the subject site comprise generally agricultural lands / open scrubland. There are two dwellings located on the site's western boundary. The site is bounded to the north by the access road linking Chapel Lane to the R132. The site is bounded to the west and south by Chapel Lane and a greenfield site lies on its eastern boundary. In terms of topography, the site is elevated at the northern end compared to the southern end.

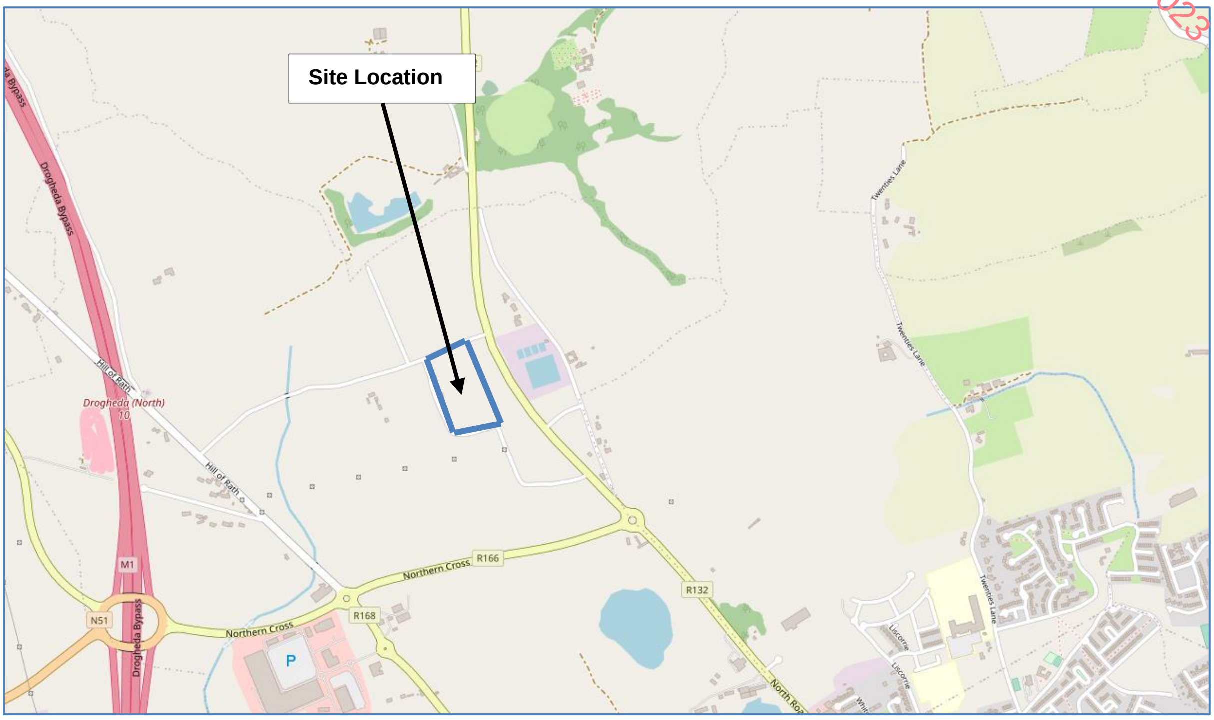

Figure 9-1 Site Location

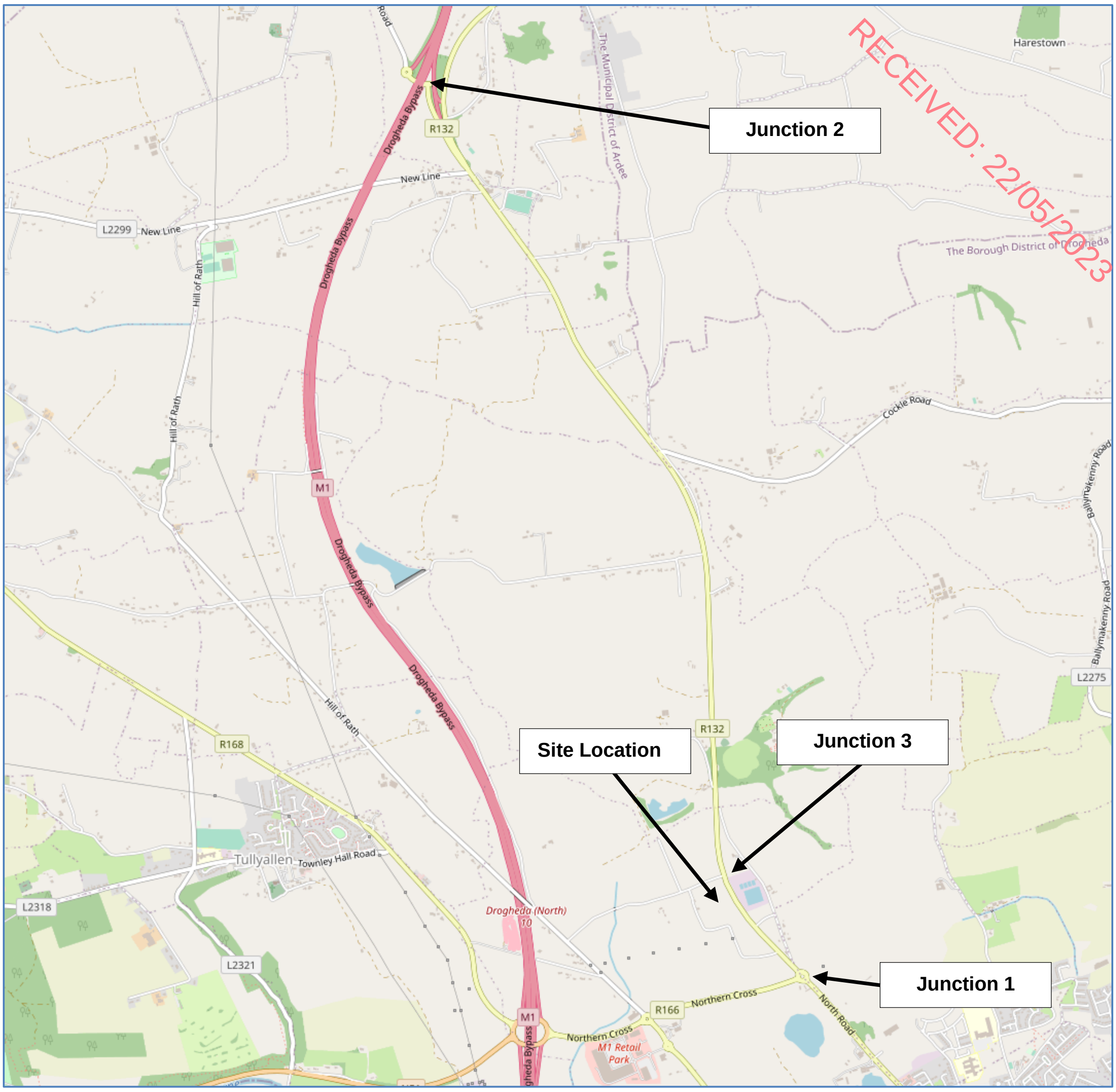

Figure 9-2 Location of Junctions included in this Assessment

9.2.4 Background Traffic

Traffic counts (12-Hour classified counts) were carried out on the 27th of October 2022, by Traffinomics Ltd., including the R132/N51 roundabout junction south of the site and the R132/Northbound M1 Link road T-junction north of the site, with these locations encompassing traffic movements at the junctions identified in Figure 9-2.

The counts were carried out between 7:00am and 7:00pm. The time period also includes the peak hours on the adjacent Regional and Local Roads. Surveyed vehicles were broken down into five categories as follows: -

- Cars
- LGV (Light Goods Vehicles)
- OGV1 (Two and three axle goods vehicles)
- OGV2 (Four and five axle goods vehicles)
- Buses

The detailed results of the traffic survey are summarised in Appendix 11. The AM and PM Peak Hours at each junction have been established as follows:

- **Junction 1:** R132/N51 Roundabout Junction (referred to as the 'R132 Roundabout' in this report) – 08: 00 to 09:00 (AM Peak) and 16:45 to 17:45 (PM Peak)
- **Junction 2:** R132/Northbound M1 Link Road T-Junction (referred to as the 'M1 Link Road Junction' in this report) – 07:45 to 08:45 (AM Peak) and 16:30 to 17:30 (PM Peak)

Junction 3 is the proposed access to accommodate the site, which is currently not operational and as a result, it was not possible to obtain traffic counts at that location. However, the AADT for each arm of this future junction has been calculated using TRICS data and the traffic counts recorded at the upstream junction.

The morning and evening peak hours at this future junction have been determined to be:

- **Junction 3:** access road linking Chapel Lane to the R132 (referred to as the 'Site Access' in this report) – 07:30 to 08:30 (AM Peak) and 16:45 to 17:45 (PM Peak)

The count data for each site has been converted to Annual Average Daily Traffic (AADT) values using the methodology described in "Expansion Factors for Short Period Traffic Counts" (Unit 16.1 TII Publications Project Appraisal Guidelines for National Roads, October 2016). Annexes A to C of the above document were used in the expansion of traffic counts to AADT's. The AADT was calculated to determine the percentage increase in traffic volumes on the road network as a result of the trips generated by the proposed development.

A combined factor of 0.767 was arrived at by combining the individual hourly factors for the count duration. This factor was then used to determine the 24-hour traffic flow. This was then converted to a Weekly Average Daily Traffic (WADT) using an index of 0.96 for the Thursday traffic count. Finally, this was converted to AADT using an index of 0.98 for the month of October. These factors were used to calculate the AADT for each of the junctions surveyed.

A summary of the estimated AADT at each junction surveyed is provided in Table 9-1 and Table 9-2.

The traffic count data forms the background traffic within the Study Area which will be used as the baseline when assessing the effect that traffic, generated by the proposed development, will have on the surrounding road network.

The section titled "Trip Generation" will describe how the traffic generated by the proposed development was calculated while "Link Capacity Assessment" and "Junction Capacity Analysis" will show that traffic related to the proposed development will have a negligible effect on traffic movements on the surrounding road network.

Table 9-1 Estimated 2022 AADTs at M1 Link Road Junction

Hour Ending	R132 Link to M1 N/B (East)	R132	R132 Link to M1 N/B (West)
08:00	137	223	222
09:00	199	336	353
10:00	127	199	194
11:00	109	192	169
12:00	111	246	213
13:00	142	217	161
14:00	154	291	233
15:00	141	293	252
16:00	188	359	309
17:00	197	476	401
18:00	238	503	405
19:00	213	364	284
Period Total	1,959	3,699	3,196
Period Total HGVs	143	296	217
% HGVs	7%	8%	7%
Total AADT	2,403	4,537	3,920

Table 9-2 Estimated 2022 AADTs at R132 Roundabout

Hour Ending	N51	R132 (North)	R132 (South)
08:00	585	704	1,025
09:00	961	855	1,228
10:00	791	614	1,019
11:00	692	575	913
12:00	716	596	916

Hour Ending	N51	R132 (North)	R132 (South)
13:00	748	592	958
14:00	793	664	1,059
15:00	893	710	1,075
16:00	915	748	1,117
17:00	1,168	916	1,278
18:00	1,198	941	1,275
19:00	897	729	1,028
Period Total	**10,357**	**8,644**	**12,891**
Period Total HGVs	**636**	**605**	**813**
% HGVs	**6%**	**7%**	**6%**
Total AADT	**11,667**	**9,737**	**14,521**

9.3 Characteristics of the development

The proposed Galvanising Facility includes a main processing building, approximately 5,719m2 in size, which includes four main areas:

- In-take / Out-take
- Process area
- Services
- Staff facilities

The office for the developments' operational phase will be provided beside the entrance. The entrance to the proposed development is along the northern boundary and will be accessed from the access road linking Chapel Lane to the R132. Pedestrian access will also be provided from the site to the access road linking Chapel Lane to the R132.

The Facility is expected to transport approximately 36,000 tonnes of material to the site annually when fully operational.

9.4 Receiving Environment

The development will be accessed from the part-built (currently closed) access road linking Chapel Lane (L6323) to the R132, which will be completed as part of the IDA's plans for the wider lands at this location (see Section 2.3.2)

9.4.1 Access Road linking Chapel Lane (L6323) to the R132

The access road is a two-way single carriageway road approximately 7.0m wide. Footpaths run along both sides of the road. The access road joins the R132 Regional Road at a part-built (currently closed on the access road arm) T-junction, east of the proposed site, which will also provide access to the future development on the wider IDA lands at this location.

9.4.2 Chapel Lane (L6323)

Chapel Lane (L6323) comprises generally a narrow, informal single lane track. A section of the road to the west of the site has been subject to widening and provision of a footpaths along the northern side of the road.

9.4.3 R132

The R132 Regional Road is a two-way single carriageway road running in a north-south direction. The proposed development shall access the R132 via the access road linking Chapel Lane to the R132. The road is approximately 98.9km in length and provides connection to various towns including, Swords, Drogheda, and Dundalk.

The width of the R132 varies along its length but is approximately 7.3m wide in the vicinity of the site access with hard shoulders on both sides and a posted speed limit of 100kph. There are no footpaths or cycle facilities available in the vicinity of the development.

9.4.4 Public Transport

There are no public transport provisions in the vicinity of the site.

9.5 Impacts of the Development

9.5.1 Construction Stage

Subject to planning permission, the Construction Stage of the proposed Galvanising Facility is expected to commence in 2023, and the length of the construction phase is estimated to be between 18 to 24 months. Operations will start on a phased basis before being finally constructed.

During the construction of the Facility it is conservatively assumed that 30 to 50 people will be employed on the site, with normal working hours assumed to be between 8.00am and 6.00pm weekdays and 8.00am to 2.00pm on Saturdays.

Assuming each of the construction workers arrive to work by car, and assuming 9 people are present on the site per day, a maximum of 9 cars, construction workers movements will generate 9 inbound trips and 9 outbound trips. For the purpose of this assessment, it was assumed that these trips would coincide with the AM and PM Peaks, which is a conservative assumption.

An additional 70 trips (35 loads) per day has been included in this assessment to account for the delivery of materials to site in accordance with the construction delivery program.

For the purposes of this assessment, it is assumed that all vehicles will arrive at the site during the AM Peak and depart during the PM Peak. This is a conservative assumption, as it is likely that arrivals and departures during the Construction Stage will be distributed throughout the day.

Direct Impacts

Trip Generation

The trips generated by the construction traffic as part of the junction capacity analysis is provided in Table 9-3.

Table 9-3 Summary of Existing Daily Trips during the Construction Stage

Development	Type of Traffic	Daily Trips	
		Arrivals	Departures
Construction	Construction LVs	9	9
	Construction HGVs	35	35
Total		44	44

The total daily trips associated with the Site during the Construction Stage accounts for 88 movements daily, 70 of which relate to HGVs (79.5%). These numbers are arrived at by summing the following components: -

- 70 daily truck movements enter and exit the site importing/exporting material
- 18 daily Site staff trips

Trip Assignment

The assignment of the forecast development traffic onto the adjacent road network is based on the existing traffic flow distribution at each junction as derived from the traffic counts and projected construction route.

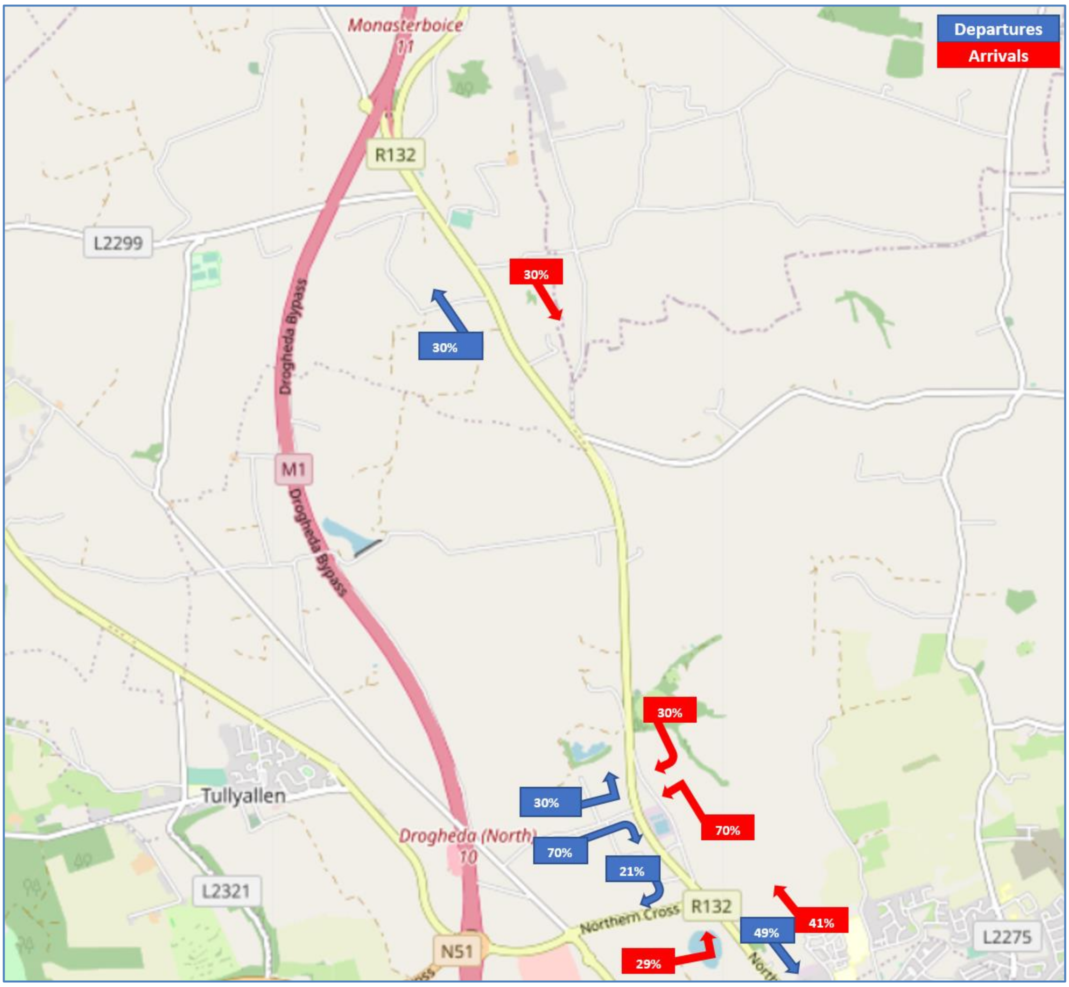

Figure 9-3 Assignment of Construction Traffic Throughout the Adjacent Road Network

Link Capacity Assessment - R132 Regional Road

The TII Publications document reference DN-GEO-03031 provides guidance on recommended rural road layouts in its Table 6/1. It advises that the capacity of a Type 1 Single Carriageway road with 7.3m cross-section is 11,600 AADT for a Level of Service D.

Therefore, the R132 is considered to be most similar to the Type 1 Single Carriageway cross-section in this document with a capacity of 11,600 AADT for Level of Service D.

Table 9-4 combined AADT for each Assessment Year (R132)

	Assessment Year		
	2022	**2023**	**2024**
Background Traffic	10,603	10,776	10,952
Additional Development Traffic	-	88	88
Combined Traffic (Background + Additional Dev. Traffic)	10,603	10,864	11,040
Additional Traffic as % of Combined Traffic	-	0.81%	0.80%

Table 9-9 indicates that the R132 will operate within capacity for each of the construction years, 2023 (construction year 1), and 2024 (construction year 2). As a result the traffic generated by the construction of the site will have a negligible impact on traffic flows on the R132.

Junction Capacity Analysis

The capacity of the surveyed junctions was assessed using the Transport Research Laboratory's (TRL) Junctions 9 computer programme.

Junction performance is measured as a ratio between the flow and capacity (RFC). The capacity analysis has been carried out for a period of 12-hours, this time period includes the peak hours on the adjacent road network, for each of the assessment years (2023, 2024, 2029, and 2039). A rural junction with an RFC below 0.85 is considered to be operating within capacity, and an RFC of 0.85 indicates a junction operating at capacity.

The capacity of a signalised junction can also be measured by its Level of Service (LOS). The LOS is denoted by a letter ranging from A – F. The following list describes the traffic conditions on a road network for each Level of Service:

- LOS A: Free-flow traffic with individual users virtually unaffected by the presence of others in the traffic stream (free-flow)
- LOS B: Stable traffic flow with a high degree of freedom to select speed and operating conditions but with some influence from other users (reasonably free flow)

- LOS C: Restricted flow that remains stable but with significant interactions with others in the traffic stream. The general level of comfort and convenience declines noticeably at this level (stable flow)
- LOS D: High-density flow in which speed and freedom to manoeuvre are severely restricted and comfort and convenience have declined even though flow remains stable (approaching unstable flow)
- LOS E: Unstable flow at, or near, capacity levels with poor levels of comfort and convenience (unstable flow)
- LOS F: Forced traffic flow in which the amount of traffic approaching a point exceeds the amount that can be served. This is characterised by stop-and-go waves, poor travel times and low comfort and convenience (forced or breakdown flow)

It is therefore considered that a junction operating at a LOS E is close to, or at, capacity and a junction operating at LOS F is considered to be above capacity.

Junction 3 is the proposed site access, and as a result the modelling scenario 'Without Development' was not included.

Junction 3: Site Access Junction with the R132

A summary of the junction capacity analysis results for the junction of the R132 Regional Road and the Site Access are shown in Table 9-5. The results indicate that the junction will continue to operate within capacity during the Construction Stage.

Table 9-5 Summary of Traffic Analysis at Junction 3

	12 Hours (07:00 – 19:00)			
	Queue (Veh)	Delay (s)	RFC	LOS
Stream	**Construction Year 1 (2023)**			
Site Access – R132 (North)	0.1	14.22	0.05	B
Site Access – R132 (South)	0.2	19.07	0.14	C
R132 (North) – R132 (South) / Site Access	0.1	9.32	0.04	A
Stream	**Construction Year 2 (2024)**			
Site Access – R132 (North)	0.2	10.62	0.16	B
Site Access – R132 (South)	0.3	19.47	0.25	C

	12 Hours (07:00 – 19:00)			
	Queue (Veh)	**Delay (s)**	**RFC**	**LOS**
R132 (North) – R132 (South) / Site Access	0.2	7.51	0.14	A

Sightlines

The posted speed limit on the R132 in the vicinity of the development is 100kph.

The visibility splays at the proposed development access were assessed based on the criteria in TII Publication DN-GEO-03060 "Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade-separated and compact grade-separated junctions)". For a speed limit of 100kph, this requires unobstructed visibility of 215m from a distance of 3.0m back from the edge of the major road.

An assessment of the visibility splays available at the junction shows that the required visibility is met.

9.5.2 Operational Stage

Direct

Trip Generation

Following construction, the Galvanising Facility is expected to transport approximately 36,000 tonnes of material to the site annually when fully operational.

In determining the daily traffic volumes associated with the development an average of 8 loads per day from the site has been calculated based on the following assumptions:

- The facility will operate for 266 days per year (240 production days per year)
- Material will be is transported to the site in 20 tonne loads.
- The facility opening times will be 06:30 to 20:00 on Monday to Friday and 08:00 to 13:00 on Saturday, giving 6 days per week. Office hours will be the same as normal operating hours with reduced numbers of staff present on Saturdays.

See Table 9-6.

The site will employ 110 staff members and it is not anticipated that these numbers will increase. Staff movements will generate 220 daily trips, 110 inbound trips and 110 outbound trips. For the purpose of this assessment, it was assumed that these trips would coincide with the AM and PM Peaks, which is a conservative assumption.

Additionally, approximately 20 trips are expected to occur weekly to cater for possible miscellaneous trips associated with the site, 10 trips inbound and 10 trips outbound. These miscellaneous trips allow for maintenance, delivery of consumables, other visitors, etc. For the purpose of this assessment, it was assumed that these trips would coincide with the AM and PM Peaks, which is a conservative assumption.

Table 9-6 Transported Quantities of Material

	Transported Material
Annual Transport Rate (tonnes per annum)	36,000
Loads per Year (20 tonnes / load)	1,800
Loads per Day (240 production days / year)	8 (7.5)

Table 9-7 Summary of Predicted Daily Trips in Opening Year and Beyond

Development	Type of Traffic	Daily Trips	
		Arrivals	Departures
Site	Transport of Material (HGVs)	8	8
	Staff (LVs)	110	110
	Misc. (LVs)	10	10
Total		128	128

The total daily trips associated with the site operation accounts for 256 movements daily, 16 of which relate to HGVs (6.25%). These numbers are arrived at by summing the following components: -

- 16 daily truck movements enter and exit the site importing/exporting material
- 220 daily staff trips
- 20 daily miscellaneous trips

Trip Assignment

The assignment of the forecast development traffic onto the adjacent road network is based on the existing traffic flow distribution at each junction as derived from the traffic counts and projected development operations route.

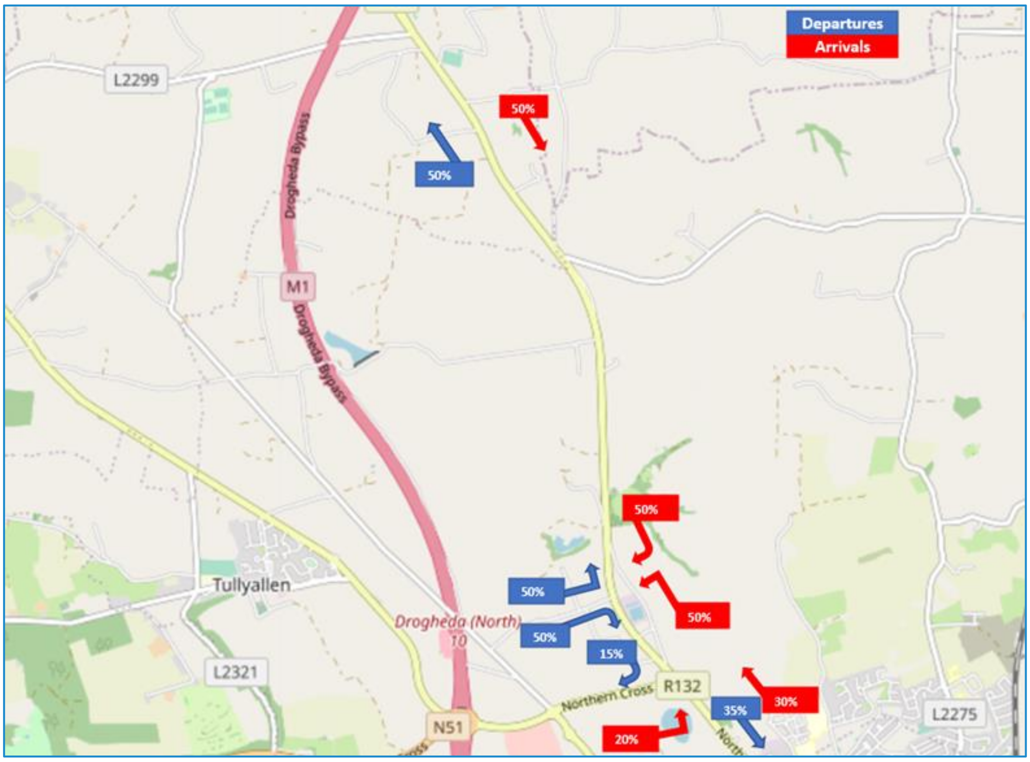

Figure 9-4 Assignment of Development Operations Traffic Throughout the Adjacent Road Network

Scope of Assessment

The proposed new Galvanising Facility will result in an increase in traffic volumes throughout the surrounding road network.

Section 2.1 of the "Traffic and Transport Assessment Guidelines" published by Transport Infrastructure Ireland recommends that a traffic assessment should cover all of the roads and junctions where the development traffic exceeds 10% of the existing or background traffic, or 5% in congested or other sensitive locations, including junctions with national roads.

Figure 9-5 outlines the distributed development traffic following the completion of the development as a percentage of the background traffic on the adjacent road network.

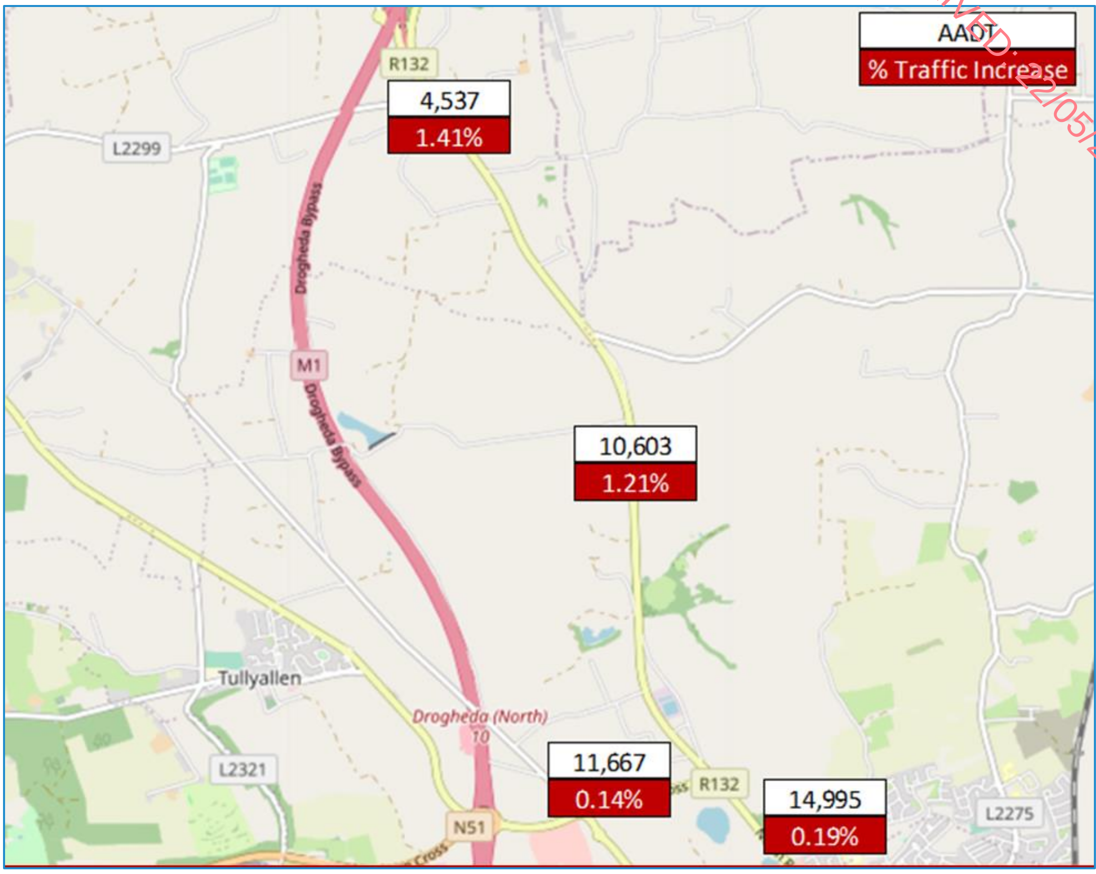

Figure 9-5 AADT and Development Traffic as a Percentage of Existing Traffic

The development traffic does not exceed 5% of the existing or background traffic in any of the adjacent junctions, with the exception of the site access which is currently unused.

As a result, this assessment shall undertake a capacity assessment of the site access on the R132.

Assessment Years

The "Traffic and Transport Assessment Guidelines" published by Transport Infrastructure Ireland recommend the assessment of traffic in the Opening Year, for the Opening Year +5 years and the Opening Year +15 years. The assessment years for the impact assessment are therefore 2024 for the Opening Year, 2029 and 2039 for the Future Assessment Years.

Traffic Growth

The "Project Appraisal Guidelines - Unit 5.3 – Travel Demand Projections (PE-PAG-02017)" published by TII in October 2021 has been used to determine future year traffic flows on the network from the 2022 traffic count data. Table 9-8 contains a summary of the traffic growth factors published in the

"Project Appraisal Guidelines". For this assessment, a central growth scenario has been adopted (a 'central' growth scenario was assumed given the site location and scale).

Table 9-8 Future Year Traffic Growth Figures (Co. Louth)

Year	Low Growth		Central Growth		High Growth	
	LV	HV	LV	HV	LV	HV
2016-2030	1.0134	1.0347	**1.0148**	**1.0363**	1.0177	1.0397
2030-2040	1.0054	1.0153	**1.0070**	**1.0174**	1.0100	1.0211

Link Capacity Assessment - R132 Regional Road

The TII Publications document reference DN-GEO-03031 provides guidance on recommended rural road layouts in its Table 6/1. It advises that the capacity of a Type 1 Single Carriageway road with 7.3m cross-section is 11,600 AADT for a Level of Service D.

Therefore, the R132 is considered to be most similar to the Type 1 Single Carriageway cross-section in this document with a capacity of 11,600 AADT for Level of Service D.

Table 9-9 Combined AADT for each Assessment Year (R132)

	Assessment Year			
	2022	2024	2029	2039
Background Traffic	10,603	10,952	11,881	12,850
Additional Development Traffic	-	256	256	256
Combined Traffic (Background + Additional Dev. Traffic)	10,603	11,208	12,137	13,106
Additional Traffic as % of Combined Traffic	-	2.28%	2.11%	1.95%

Table 9-9 indicates that the R132 will operate within capacity for 2024 (assumed year of opening). However, in 2029, the R132, in the vicinity of the proposed Galvanising Facility, will have an AADT of 11,881 (excluding the current development traffic), which is above the maximum AADT (i.e. 11,600) for a ‘Type 1 Single Carriageway’ road at Level of Service D. Thus, the R132 at its junction with the site access will be above capacity for 2029 and for the following years. However, this would be the case with, or without, the proposed development

Table 9-9 above indicate that the increased traffic generated by the Facility, given the conservative approach adopted, accounts for between 1.95% and 2.28% of the traffic on the R132 between 2024 and 2039. As a result, despite the AADT on the R132 exceeding the capacity of a ‘Type 1 Single Carriageway’ road at Level of Service D, the future traffic generated by the operation of the site will have a negligible impact on traffic flows on the R132.

Junction Capacity Analysis

The capacity of the surveyed junctions was assessed using the Transport Research Laboratory's (TRL) Junctions 9 computer programme.

Junction performance is measured as a ratio between the flow and capacity (RFC). The capacity analysis has been carried out for a period of 12-hours, this time period includes the peak hours on the adjacent road network, for each of the assessment years (2024, 2029, and 2039). A rural junction with an RFC below 0.85 is considered to be operating within capacity, and an RFC of 0.85 indicates a junction operating at capacity.

The capacity of a signalised junction can also be measured by its Level of Service (LOS). The LOS is denoted by a letter ranging from A – F. The following list describes the traffic conditions on a road network for each Level of Service:

i. **LOS A:** Free-flow traffic with individual users virtually unaffected by the presence of others in the traffic stream (free-flow)

ii. **LOS B:** Stable traffic flow with a high degree of freedom to select speed and operating conditions but with some influence from other users (reasonably free flow)

iii. **LOS C:** Restricted flow that remains stable but with significant interactions with others in the traffic stream. The general level of comfort and convenience declines noticeably at this level (stable flow)

iv. **LOS D:** High-density flow in which speed and freedom to manoeuvre are severely restricted and comfort and convenience have declined even though flow remains stable (approaching unstable flow)

v. **LOS E:** Unstable flow at, or near, capacity levels with poor levels of comfort and convenience (unstable flow)

vi. **LOS F:** Forced traffic flow in which the amount of traffic approaching a point exceeds the amount that can be served. This is characterised by stop-and-go waves, poor travel times and low comfort and convenience (forced or breakdown flow)

It is therefore considered that a junction operating at a LOS E is close to, or at, capacity and a junction operating at LOS F is considered to be above capacity.

Junction 3 is the site access, which is currently closed and as a result the modelling scenario 'Without Development' was not included.

The detailed junction capacity analysis outputs for the analysed junction, for each of the assessment years, are contained within Appendix 12.

Junction 3: Site Access

A summary of the junction capacity analysis results for the junction of the R132 Regional Road and the Site Access are shown in Table 9-10. The results indicate that the junction will continue to operate within capacity for each of the assessment years 2024, 2029 and 2039.

Table 9-10 Summary of Traffic Analysis at Junction 3

	12 Hours (07:00 – 19:00)			
	Queue (Veh)	Delay (s)	RFC	LOS
Stream	**2024**			
Site Access – R132 (North)	0.1	13.63	0.12	B
Site Access – R132 (South)	0.2	21.42	0.17	C
R132 (North) – R132 (South) / Site Access	0.1	14.86	0.12	B
Stream	**2029**			
Site Access – R132 (North)	0.1	14.09	0.12	B
Site Access – R132 (South)	0.2	23.07	0.18	C
R132 (North) – R132 (South) / Site Access	0.2	15.22	0.12	C
Stream	**2039**			
Site Access – R132 (North)	0.1	14.61	0.13	B
Site Access – R132 (South)	0.2	25.11	0.20	D
R132 (North) – R132 (South) / Site Access	0.2	15.66	0.12	C

Port Northern Cross Route (PANCR) Scheme

The proposed Drogheda Port Access Northern Cross Route (PANCR) is a future scheme being developed by Louth County Council that would provide a direct link from the M1 Motorway to Drogheda Port, thus removing heavy port related traffic from the town centre. It would also release strategically located employment and residential lands in the northern part of the town. The provision of this link road is a fundamental part of the long term growth strategy for Drogheda Town.

The proposed scheme does not directly impact the road network surrounding the proposed galvanising plant, however, it is considered that if implemented, it would benefit the traffic conditions on the R181 Regional Road adjoining the site access, offering an alternative route between the M1 and Drogheda Town.

Sightlines

The posted speed limit on the R132 in the vicinity of the development is 100kph.

Visibility splays at the proposed development access were assessed based on the criteria in TII Publication DN-GEO-03060 “Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade-separated and compact grade-separated junctions)”. For a speed limit of 100kph, this requires unobstructed visibility of 215m from a distance of 3.0m back from the edge of the major road.

Figure 9-6 Visibility along the R132 to the north (left) and south (right) from the site access

An assessment of the visibility splays available at the junction shows that the required visibility is met.

Site Access

The entrance to the proposed development will be from the access road linking Chapel Lane to the R132 on the sites northern boundary. The proposed development shall have access to the R132 via the access road linking Chapel Lane to the R132.

Public Transport

There are no public transport facilities in the vicinity of the Site.

Parking

The proposed development includes the provision of 110 car parking spaces, 2 and 7 of which will be mobility impaired and electric vehicle charging parking spaces respectively. Lorry/trailer parking spaces will also be provided to accommodate the expected number of HGVs.

This level of parking provision is considered sufficient for the development, and it's intended operation. The provision of 110 car parking spaces is deemed to be sufficient, including for any visitors to the facility, when the following factors are taken into consideration:

- A number of office-based staff work from home.
- There will be a number of staff who travel to work by bicycle, by foot or by public transport.
- A number of staff will use ride sharing/car-pooling.

9.5.3 Unplanned Events

Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports indicates that EIARs should address unplanned effects as relevant (examples include accidents, spills, floods and fires). Directive 2014/52/EU further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned. The Directive gives examples of 'flooding, sea level rise, or earthquakes'.

No significant impacts on Traffic and Transportation arising from unplanned events such as major accidents and disasters including spills, floods and fires have been identified by the assessment.

9.5.4 Cumulative impacts

Effects arising in respect of existing developments are considered within the assessment of the receiving environment, and as such are considered cumulatively with the effects of the proposed development as set out in this Chapter.

In accordance with EIA legislation and Table 3.5 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (see Section 1.9 of Chapter 1), a search was undertaken for approved developments, but not yet built or operational, of relevance to the consideration of cumulative effects in respect of Traffic and Transportation and none were identified.

9.5.5 Do-nothing' impacts

In the event that the proposed development did not proceed, the effects of the project on Traffic & Transportation would not arise.

9.5.6 Table of Impacts

Table 9-11 Table of Impacts

Scenarios where Impacts may arise	Potential Impact				Quality of Effect	Significance of Effect	Extent/Context of Effect	Probability	Duration
	Activity	Attribute/receiving environment	Importance of attribute/sensitivity of receiving environment	Nature of Effect (description)					
Construction phase	The Impact of traffic on the local road network during the construction phase	Local Road Network	Low	Increase in traffic may result in congestion.	Negative	Imperceptible	Within the Local Vicinity	Likely	Temporary
Operational phase	The Impact of traffic on the local road network during the operational phase	Local Road Network	Low	Increase in traffic may result in congestion.	Negative	Imperceptible	Within the Local Vicinity	Likely	Continuous

9.6 Mitigation Measures

Following assessment, the additional trips associated with the construction and operation of the proposed Galvanising Facility were found to have an imperceptible impact on link and junction capacity, and an imperceptible impact in relation to Road Safety and existing Road Infrastructure.

Table 9-12 Mitigation Measures

Scenarios where Impacts may arise	Potential Impact			Mitigation measure	Residual effect (following mitigation)	
	Activity	**Attribute/receiving environment**	**Nature of Effect (description)**	**Description**	**Significance or quality of Effect**	**Probability**
Construction phase	The impact of traffic on the local road network during the Construction Phase.	Local Road Network	Increase in traffic may result in congestion.	Impacts have been determined to be Imperceptible, therefore, no mitigation measures are required during the Construction Phase. However, the Contractor will prepare a Construction Environmental Management Plan (CEMP), which shall coordinate and manage all Construction activities in close liaison with the Local Authority, Local Stakeholders, and members of the Public.	Imperceptible	Unlikely
Operational phase	The impact of traffic on the local road network during the Construction Phase.	Local Road Network	Increase in traffic may result in congestion.	Impacts have been determined to be Imperceptible, therefore, no mitigation measures are required during the Operational Phase. However, a Mobility Management Plan shall be prepared by the developer, and will be	Imperceptible	Unlikely

				managed as a live document when the development is operational, and will promote sustainable modes of transport for all employees.		

9.7 Monitoring measures

During the construction phase, a Construction Traffic Management Plan shall be in place for the relevant work areas. Monitoring of this phase will be regulated through adherence to the plan.

During both the construction and operational phase, the growth of vegetation on both sides of the proposed site access during the Construction Stage will be monitored and routinely cut back to ensure the maximum visibility for exiting drivers is maintained at all times.

Traffic monitoring is not proposed for the operational phase of the facility.

9.8 Residual impacts

The Residual effects are deemed imperceptible.

9.9 Interactions with other impacts

Interactions with other impacts are deemed imperceptible.

9.10 Bibliography

"Traffic and Transport Assessment Guidelines" (September 2014) published by the National Roads Authority (now Transport Infrastructure Ireland (TII))

Unit 5.3 (Travel Demand Projections) of the "Project Appraisal Guidelines" (2019) published by Transport Infrastructure Ireland

Unit 16.1 (Expansion Factors for Short Period Traffic Counts) of the "Project Appraisal Guidelines" (2016) published by Transport Infrastructure Ireland

Design Manual for Urban Roads and Streets (DMURS) published by the Department of Transport, Tourism and Sport and the Department of Housing, Planning and Local Government in May 2019

TII Publications document DN-GEO-03031, "Rural Road Link Design" (June 2017) published by TII

TII Publications document DN-GEO-03060, "Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade-separated and compact grade-separated junctions)" (June 2017) published by TII

10 NOISE

10.1 Introduction

This section of the EIAR deals with the potential noise impacts associated with the proposed development.

Fitzsimons Walsh Environmental Limited has been retained to undertake an Environmental Noise Impact Assessment (NIA) of the proposed development which will consist of a hot-dip galvanising facility with zinc kettle at Mell, Drogheda, Co. Louth. It is planned to process up to 36,000TPA of steel at the plant in an area of approximately 3.3 Ha.

The noise assessment has been undertaken by Mr. Oliver Fitzsimons MSc, BSc Environmental Science. Mr Fitzsimons has over 20 years of experience preparing noise impact assessments.

No difficulties were encountered during the assessment.

10.2 Methodology

This chapter has been compiled in accordance with Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

The environmental noise impact assessment follows the following methodology:

- Establish the existing noise environment
- Determine applicable noise limits
- Description of the noise aspects of the proposal
- Predict potential noise impacts associated with the proposal
- Suggest mitigating measures
- Establish residual noise impacts
- Conclusions

10.3 Characteristics of the development

The proposed development will consist of a hot-dip galvanising facility with zinc kettle at Mell, Drogheda, Co. Louth. It is planned to process up to 36,000 Tonnes of steel annually at the plant in an area of approximately 3.3 Ha. Site infrastructure includes a main processing building (approx. 5,719 m^2) which includes four main areas

- In-take/out-take
- Process area

- Services
- Staff facilities.

The proposed main building will be in two sections with maximum heights above finished ground levels of 17.30m and 14.55 m respectively. The proposed building heights are for operational reasons and to accommodate required equipment. There will be four stacks on the roof, all 20m above finished floor level. Two will be running continuously, one will be running during production hours and one won't be running at all (standby boiler).

Parking

Parking facilities for staff and visitors is provided in the northern part of the site. Disabled parking, EV charging points and bicycle parking will be provided. Truck parking facilities will also be provided.

Adequate truck parking will be provided for the proposed plant throughput.

Weighbridges

A double weighbridge will be provided close to the site entrance.

Site Entrance

The development will be accessed from the part-built (currently closed) access road linking Chapel Lane (L6323) to the R132, which will be completed as part of the IDA's plans for the wider lands at this location (see Section 2.3.2). Construction and operational traffic from the proposed development will use the access road linking Chapel Lane to the R132 access on the R132 only.
Pedestrian access will also be provided from the site to the access road linking Chapel Lane to the R132.

Site offices

The main office for the operational phase will be provided beside the entrance. Staff offices and facilities will also be provided in the main building.

Surfaces used in the yard

Hardstanding around the main building consists of an inner area of concrete and an outer gravelled area. The car park is surfaced with asphalt roadways and permeable hardstanding parking spaces.

Storm water management

Storm water from the site will be managed through infiltration subject and by attenuated discharge to local water course.

Services

In respect of mains water and foul water (and possibly also electricity and telecoms depending on the IDA's plans), supporting infrastructure is to be provided by the IDA / IDA in conjunction with other bodies as applicable as part of the IDA's infrastructure enhancement project to support the development of the wider IDA lands at this location (see Section 2.3.5).

10.4 Receiving environment

The application site is located in the townland of Mell, Co. Louth, approximately 2.5 km north-west of the town of Drogheda, and just to the west of the R132 road. The application site consists of approximately 3.3 Ha.

Noise Sensitive Receptors proximal to the extant/proposed development site are identified in Table 10-1 and illustrated in Figure 10-1

The existing ambient noise levels were established during a period of continuous monitoring at a representative location in the environs of the proposed development. The complete dataset from the baseline study is given in the Appendix 13.

The land surrounding the facility is used predominantly for non-intensive agricultural activity / is open scrubland. Population density is low with ribbon development along the local road network.
The existing noise environment is elevated being dominated by road traffic on the proximal R132 road and the M1 motorway (c. 1 kilometre west of the site).

Ambient and background, day and nighttime, noise levels are heavily influenced by road traffic noise.

Table 10-1 Noise Sensitive Receptors (NSRs)

Id	Address
NSR1	Chapel Lane (L6323), KILLINEER, DROGHEDA. CO. LOUTH, A92 F6Y0
NSR2	Chapel Lane (L6323), KILLINEER, DROGHEDA. CO. LOUTH, A92 Y5F7
NSR3	Chapel Lane (L6323). KILLINEER, DROGHEDA. CO. LOUTH, A92 X9F2
NSR4	THE WILLOWS. ROSEHALL. KILLINEER, DROGHEDA, CO. LOUTH, A92 EFH9

NSR5	ROSEHALLKILLINEER DROGHEDA, CO. LOUTH. A92 K6FK
NSR6	THE ORCHARD. ROSEHALL, KILLINEER, DROGHEDA, CO. LOUTH. A92 R2DD
NSR7	THE COACH HOUSE. ROSEHALL, KILLINEER, DROGHEDA. CO. LOUTH. A92 W448
NSR8	ROSEHALL. KILLINEER, DROGHEDA, CO. LOUTH. A92 K84W
NSR9	ROSEHALL. KILLINEER, DROGHEDA, CO. LOUTH. A92 WC47
NSR10	ROSEHALL, KILLINEER, DROGHEDA, CO. LOUTH. A92 C6Y3
NSR11	ROSEHALL COTTAGE, ROSEHALL, KILLINEER, DROGHEDA, CO. LOUTH. A92 WTR8
NSR12	ROSEHALL, KILLINEER, DROGHEDA, CO. LOUTH. A92 CXD8
NSR13	ROSEHALL, KILLINEER, DROGHEDA, CO. LOUTH. A92 D68Y
NSR14	KILLINEER, DROGHEDA, CO. LOUTH. A92 TYP4
NSR15	WATERUNDER, DROGHEDA, CO. LOUTH. A92 DD35

Figure 10-1 Site Location and NSRs Defining the existing Noise Environment

The procedure detailed in the EPA guidance document NG4 (Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities) has been followed in assessing the existing noise environment. According to NG4 a four-step process should be followed to determine appropriate noise criteria for a potential development.

Step 1 – **Quiet Area Screening** of the Development Location

Step 2 – **Baseline Environmental** Noise Survey

Step 3 – S**creen for Areas of Low Background Noise**

Step 4 – **Determine Appropriate Noise Criteria**

Step 1: Quiet area screening of the development location

It was determined at the preliminary screening stage that the proposed site does not meet the necessary criteria and is therefore not considered to be a quiet area as per the EPA definition. Due primarily to the site's proximity to a busy road network and proximal a large urban area.

Step2: Baseline Environmental Noise Survey

A baseline noise monitoring survey was carried out in accordance with ISO 1996 (Acoustics - Description and Measurement of Environmental Noise - Parts 1 & 2).

An environmental noise survey was carried out at two strategically chosen noise sensitive receptors (NSR) proximal to the proposed development.

Traditionally environmental noise limits have been stated over daytime and night-time periods only.

With this in mind the baseline noise data has been divided into these distinct time categories in accordance with ISO 1996-1. Acoustics — Description, measurement and assessment of environmental noise - Part 1: Basic quantities and assessment procedures

Daytime Period	07:00 – 22:00
Night Period	22:00 – 07:00

The existing ambient (LAeq) and background noise (LA90) levels in the areas of the proposed development were established during a period of continuous monitoring at the two representative locations.

Noise monitoring was undertaken over the period 5th to the 12th November 2022 at a location to the rear of NSRs 1 & 2: see Table 10-2.

Table 10-2 Noise monitoring locations

Id	Location	Relative position
N1	To the rear of NSRs 1 & 2 (Eir: A92 F6Y0 & Eir: A92 Y5F7)	Two closest NSRs immediately west of the proposed site
N2	Open space North of Eir. A92 X9F2	Next nearest NSR west of the site

Survey Methodology

The following conditions were adhered to in undertaking the noise survey:

- Measurement of ambient noise levels were taken during good weather conditions using instruments of Class 1 specification.
- Weather variables including rainfall and wind speed were recorded for the duration of the survey.
  - Wind speeds <3 m/s
  - No precipitation
- Monitoring locations were selected to coincide with local residences.
- Measurements were undertaken during weekday and weekend periods.
- The survey was carried out in accordance with ISO 1996 Part 1 (Description and Measurement of Environmental Noise - Part 1: Basic Quantities and Procedures) The noise monitoring equipment was positioned proximal to NSRs correctly located at 1.5m above ground level and away from reflecting surfaces.
- Acoustic instrumentation was field calibrated before and after the survey.
  - No drift of calibration was observed (calibration level 114 dB at 1000 Hz).

Instrumentation Used

The following instrumentation was used in the baseline survey:

- One no. Larson Davis Lxt Precision Integrating Sound Level Analyser/Data logger
- Wind Shields Type: Larson Davis 2120 Windscreen
- Calibration Type: Larson Davis Precision Acoustic Calibrator Model CA 250

Noise Survey Results

The complete dataset from the baseline study is presented in the Appendix 13.

A summary of the interval (mean & modal values) measurements is given in Table 10-3.

Table 10-3 Baseline noise levels

Monitoring Location id		Day-time Noise levels dB(A)			Night-time Noise levels dB(A)		
		LeqT[1]	L_{10}	L_{90}	LeqT	L_{10}	L_{90}
N1	Mean	**54**	**56**	**51**	**48**	**51**	**43**
	Mode	**55**	**57**	**51**	**48**	**52**	**43**
N2	Mean	**53**	**55**	**50**	**47**	**51**	**42**
	Mode	**54**	**57**	**49**	**47**	**52**	**41**

Ambient and background noise levels are elevated due primarily to heavy volumes of road traffic on the local road network.

- [1] Average noise levels for a specific period are the arithmetic average of the measured LAF noise levels during the relevant period. 30 Minute Interval
- All noise levels derived averages are rounded to the nearest whole integer
- Leq is the equivalent continuous noise level or ambient level.
- L10 is the noise level exceeded or equalled for 10% of the interval.
- L90 (background) is the noise level equalled or exceeded for 90% of a sample interval

Step 3 Screening for Areas of Low Background Noise

For all areas not identified as 'Quiet Areas' in Step 1, the existing background noise levels measured during the environmental noise survey are examined to determine if they satisfy the following criteria:

- Average Daytime Background Noise Level ≤ 40dB LAF90, and
- Average Night-time Background Noise Level ≤ 30dB LAF90.

It is apparent that the criteria listed above are not pertinent to this particular site and its therefore deemed not to be "Areas of Low Background Noise".

Step 4 Setting Appropriate Noise Criteria/Limits

Operational Phase Noise Limits

Table 10-4 details recommended noise limits of each time period for sites with differing background noise levels.

Table 10-4 Recommended noise criteria

Scenario	Daytime	Night-time
Quiet Area	Noise from the licensed site to be at least 10dB below the average daytime background noise level measured during the baseline noise survey.	Noise from the licensed site to be at least 10dB below the average night-time background noise level measured during the baseline noise survey.
Areas of Low Background Noise	45dB	35dB
All other Areas	55dB	45dB

- The sites falls outside the categories of 'Quiet Area' and of 'Area of Low Background Noise' therefore the following noise limits are deemed appropriate for the site:
  - Daytime 55 dBA
  - Night 45 dBA

Additional noise conditions:

- There shall be no clearly audible tonal component in the noise emission from any activity at any noise sensitive location'.
- Operational sirens and similar, in routine use on-site shall be modified and maintained so as not to be audible at any noise sensitive location.

It is recommended that theses limits are applied the Nearest Noise Sensitive Receptor and not at the site boundary.

Construction Phase Noise Limits

There is no published national guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. However National Roads Authority ("NRA") give limit values which are deemed acceptable ("the NRA Guidelines")[1]. Guidance to predict and control noise is also given in BS 5228:2009, where Part 1 deals with Noise. The NRA guidelines for construction noise which are considered typically acceptable are given in Table 10-5.

Table 10-5 Noise Levels that are typically acceptable

Day	Time	Guidance Limit
Monday to Friday	07:00 – 19:00hrs	70dB LAeq, (1h) and LAmax 80dB
	19:00 – 22:00hrs	60dB LAeq, (1h) and LAmax 65dB
Saturday	08:00 – 16:30hrs	65dB LAeq,1h and LAmax75dB
Sunday and Bank Holidays	08:00 – 16:30hrs	60dB LAeq,1h and LAmax 65dB

Note: Construction outside of these times, other than required by an emergency works, will normally require explicit permission from the relevant local authority

Part 1 of BS 5228 provides several example criteria for the assessment of the significance of noise effects from construction activities. Noise levels generated by construction activities are considered significant if:

- The LAeq, period level of construction noise exceeds lower threshold values of 65dB during daytime, 55dB during evenings and weekends or 45dB at night, and;
- The total noise level (pre-construction ambient noise plus construction noise) exceeds the pre-construction noise level by 5dB or more for a period of one month or more.

[1] National Roads Authority, *Guidelines for Noise and Vibration in National Road Schemes.*

10.5 Impacts of the development

Environmental Noise impacts are associated with nuisance rather that damage to public health associated with hearing loss. Noise emissions do not accumulate in the environment and do not persist post cessation of the event.

Noise Sensitive Receptors potentially impacted by the proposed development haven been identified. Upon cessation of the activity all noise associated with the proposed development will desist.

10.5.1 Noise Prediction Methodology

The predicted noise levels generated by construction activity at a particular location can be calculated according to the following formula:

$Lp2 = Lp1 + \Delta L\psi - \Sigma\Delta L$ where,

$Lp2$ = Sound Pressure level in decibels at Residence.

$Lp1$ = Sound pressure level in decibels at 20 metres.

$\Delta L\psi$ = correction for direction effects in a horizontal plane,

$\Sigma\Delta L = \Delta Ld + \Delta La + \Delta Lr + \Delta Ls + \Delta Lv + \Delta Lg + \Delta Lw$, and where,

ΔLd = geometric spreading (spherical radiation) and is calculated according to:

$\Delta Ld = 20 \log_{10} (d1/d2)$, where, d1 is the residence distance in metres, while d2 is 20 metres.

ΔLa = air absorption

ΔLr = reflection and diffraction

ΔLs = screening

ΔLv = vegetation

ΔLg = ground absorption

ΔLw = wind gradients

10.5.2 Construction stage noise impacts

The construction phase is anticipated to last for 18-24 months. The first stages will involve site set-up, site clearance and earthworks as described in Section 2.4.2. It is during this stage that the maximum construction related noise levels will prevail.

A portion of the soil will be utilised to construct a soil berm (3m high) on along the western site boundary. An additional 1m impermeable fence will be installed on top of the soil berm[7].

This berm will act to reduce the noise levels from the site at NSR1, NSR2 and NSR3.

Table 10-6 Presents a list of plant and machinery likely to be utilised during the site set-up, site clearance and earthworks part of the construction phase.

Table 10-6 List of typical construction plant and associated noise levels

Type	Sound Pressure level dB(A) Leq @ 10 meters
Dump truck	72
Excavator- Wheeled	72
Large Excavator – Tracked	75
Large Bulldozer	80
Excavator ripping rock	81
Vibrating Roller	68
Grader	73
Tractor/Bowser	70
Tracked Excavator rock breaking	83

Table 10-7 Predicted noise levels at key locations from construction activity

Location id (NSR)	Predicted Maximum Levels LAeqT - 1 hour dB(A)	Predicted Maximum Levels LAeqT - 1 hour dB(A)
	Without soil berm	With soil berm
NSR1	75	62
NSR2	75	62
NSR3	60	47
NSR4	59	59
NSR5	58	58
NSR6	58	58
NSR7	56	56
NSR8	56	56
NSR9	55	55
NSR10	54	54
NSR11	54	54

[7] The soil berm will double as an acoustic barrier and a landscape feature.

NSR12	55	55
NSR13	53	53
NSR14	52	52
NSR15	51	51

- The predicted construction noise levels would be below the recommended daytime noise limit of 70 dBA.
- Construction activity at the facility will be during daytime hours only.

10.5.3 Operational stage noise impacts

Opening hours:	**6:30 to 20:00 Monday to Friday**	**08:00 to 13:00 Saturdays**
Production hours	**07:00 to 17:00 Monday to Friday**	-

Production hours refers to the galvanising process only, outside of these hours but during opening hours there will be some operations including loading & un-loading, general maintenance & housekeeping, prep for production runs etc.

Noise emissions will be associated with mobile and fixed plant and machinery. Table 10.8 presents a list of all plant planned for the facility.

Table 10-8 Operational Noise sources

Type	Number of units	Typical Noise level dB(A) Leq @ 5 meters	Notes
Outdoor Noise Sources			
Teleporter	1	78	Daytime only
Forklift	2	70	Daytime only
HGV	2	78	Daytime only
Atmospheric emission abatement	2	45	Daytime only
		Typical Noise level	
Type	**Number**	**dB(A) Leq @ 1 meters**	**Notes**
Indoor Noise Sources			
Blowers	2	87	Day and night
Gantry crane	1	85	Day and night

Forklift	2	70	Daytime only

Building specification

1. Roof: Double-skinned, insulated cladding.
2. Walls: Double-skinned, insulated cladding to roof
3. Roller shutter doors

Noise insulation properties of building materials

- The acoustic performance characteristics are specified below:

Sound reduction index (SRI)

The sound reduction index (SRI) is a measure of the reduction in the intensity of sound when it passes through part of a building; in other words, the level of sound insulation provided. It is the difference between the sound intensity that hits one side of an object (such as a wall, door, window, partition and so on) and the sound intensity measured on the other side, expressed in decibels (dB).

Building Component Weighted sound reduction index (Rw)[1]

- Concrete Walls, 28 dB[2]
- Roof and wall panels 28.5 dB[3]
- Roller shutter door. 30 dB[4]

Please refer to Appendix 10.14 for details.

Predicted noise levels - Operational Phase

Table 10-9 Predicted operational noise levels – Daytime

Location id (NSR)	Predicted Maximum Levels LAeqT - 1 hour dB(A)
NSR1	51
NSR2	51
NSR3	36
NSR4	36
NSR5	35
NSR6	34
NSR7	33
NSR8	32
NSR9	31

NSR10	31
NSR11	30
NSR12	31
NSR13	30
NSR14	28
NSR15	27

- The predicted operational noise levels would be below the recommended daytime noise limit of 55 dBA.
- Activity at the facility will be during daytime hours only

[1] The weighted sound reduction index, Rw, a single number value expressed in decibels (dB) indicating the overall sound insulation performance
[2] BS 5228-1:2009
[3] Roof & wall manufacturer's specification, see appendix 10.14
[4] Door manufacturer's specification, see appendix 10.14

10.5.4 Traffic Noise Impacts

Please refer to EIAR Section 9 Traffic and transportation

Traffic associated with the development

Traffic will access and exit the site onto the R132 regional road.
It is anticipated that the proposed development will generate the following traffic numbers: Table 10-10.

Table 10-10 Predicted Traffic volumes

Phase	**Annual Average Daily Traffic (ADDT)**	**Number/% of which HGV**
Construction phase	88 movements daily	70 of which relate to HGVs (79.5%).
Operational Phase	256 movements daily	16 of which relate to HGVs (6.25%).

Table 10-11 Extant traffic volumes

Road	**Junction Arm**	**Base year**		
		AADT	**HGVs**	**HGVs**
R132/N51 Roundabout Junction	N51 Link to M1 Junction 10	11,667	636	5.45%
	R132 North	9,737	605	6.21%
	R132 South	14,521	813	5.60%
R132/Northbound M1 Link Road T-Junction	R132 Link to M1 Northbound (East)	2,403	143	5.95%
	R132	4,537	296	6.52%

	R132 Link to M1 Northbound (West)	3,920	217	5.54%

Potential Traffic-Noise Impacts

Increases in noise levels can be accurately calculated when the percentage increase in traffic flow is known (Ref. HMSO Calculation of Road Traffic Noise, 1988). There is a logarithmic relationship between noise levels and traffic volume and the higher the existing traffic volume the greater the traffic increase required to produce a perceptible noise change. Typically, doubling the traffic flow produces a 3 dB (A) change in noise level.

The estimated percentage increase in traffic on the R132 Regional Road as a result of the traffic generated by the proposed development for the construction phase.

- 2023- Construction Year 1 (**0.81%**),
- 2024- Construction Year 2 (**0.80%**)

The estimated percentage increase in traffic on the R132 Regional Road as a result of the traffic generated by the proposed development for the operational phase.

- 2024- Year 1 (2.28%),
- 2029- Year +5 (2.11%) and
- 2039- Year +15 (**1.95%**)

The anticipated road traffic associated with the proposed development would have a negligible contribution to traffic related noise emissions.

10.5.5 Unplanned events

Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports indicates that EIARs should address unplanned effects as relevant (examples include accidents, spills, floods and fires). Directive 2014/52/EU further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned. The Directive gives examples of ‘flooding, sea level rise, or earthquakes’.

With regards to unplanned events (Accidental / Major disasters) such as accidents, fire or a spillage, the risk would be considered low. The noise impacts would be short term and would be considered Negligible.

10.5.6 Cumulative impacts

Apart from road traffic noise there are no other significant anthropogenic noise sources in the area of the proposed development.

Effects arising in respect of existing developments are considered within the assessment of the receiving environment, and as such are considered cumulatively with the effects of the proposed development as set out in this Chapter.

In accordance with EIA legislation and Table 3.5 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (see Section 1.9 of Chapter 1), a search was undertaken for approved developments, but not yet built or operational, of relevance to the consideration of cumulative effects in respect of Noise and none were identified.

10.5.7 'Do-nothing' impacts

In the event that the proposed development did not proceed, the effects of the development on Noise considered in this chapter would not arise.

As identified above the noise environment would continue to be influenced by extant sources most notably non-associated road traffic on the proximal road network and agricultural activity.

Table 10-12 Summary of Potential Impacts

Scenario where Impacts May Arise	Potential Impacts				Quality of Effect	Significance of effect	Extent/Context of effect	Probability	Duration
	Activity	Attribute/receiving environment	Importance of attribute/sensitivity of receiving environment	Nature of effect (description)					
Construction Phase	Construction of buildings and facilities as set out in the plans submitted	Residential Dwellings as identified	High	Direct	Negative	Moderate	Within 0.5 km. The noise environment will be altered during daytime hours during the construction phase.	Likely	Temporary. Up to 24 months
Operational Phase	Metal galvanising	Residential Dwellings as identified	High	Direct	Negative	Moderate	Within 0.5 km	Likely	Long-term. For the lifetime of the facility.

10.6 Mitigation measures

10.6.1 Soil berm & impermeable fence

A 3 metre high soil berm with a 1 metre impermeable fence erected atop the berm will be installed on the western site boundary. This berm and fence will act to reduce the noise levels from the site at NSR1, NSR2 and NSR3.

The berm and fence will reduce the noise emissions from the site by 13 dBA for NSRs 1,2 and 3.

10.6.2 Reduction at source

The movement of plant onto and around the site should have regard to the normal operating hours of the site and the location of any NSRs as far as is reasonably practicable.

The use of conventional audible reversing alarms may cause problems and alternatives are available (e.g. White Noise & Multi-frequency Alarms).

Audible reversing warning systems on mobile plant and vehicles should be of a type which, whilst ensuring that they give proper warning, have a minimum noise impact on persons outside sites.

10.6.3 Maintenance

Regular and effective maintenance by trained personnel is essential and will do much to reduce noise from plant and machinery.

Noise caused by vibrating machinery having rotating parts can be reduced by attention to proper balancing.

Noises caused by friction in mechanical moving parts can be reduced by proper lubrication.

10.6.4 Training

Workers should be trained to employ appropriate techniques to keep site noise to a minimum, and should be effectively supervised to ensure that best working practice in respect of noise reduction is followed.

Site inductions and "tool box talks" will be used to communicate with workers as well as availability of site procedures.

Good practice includes:

1. the proper use and maintenance of tools and equipment;

2. the positioning of machinery on site to reduce the emission of noise to the neighbourhood and to site personnel
3. the avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment
4. avoid unnecessary revving of engines and switch off equipment when not required.

10.7 Monitoring measures

It is recommended that the findings of this section of the EIAR are incorporated into a Construction Environmental Management Plan (CEMP) prior to commencement of construction activities
Due to the close proximity of NSR 1 and NSR 2 due care and attention will be necessary to ensure noise levels are controlled within acceptable limits.

It is recommended that noise monitoring be undertaken during the construction phase, both before and after the soil berm and impermeable fence are installed.

During the operational phase it is recommended that a noise surveys be undertaken to demonstrate that the facility is operating withing acceptable limits.

10.8 Residual impacts

The residual effects are the final predicted or intended effects which occur after the proposed mitigation measures have been implemented.

10.8.1 Construction Phase

Table 10-13 Predicted noise levels at key locations from construction activity

Location id (NSR)	Predicted Maximum Levels LAeqT - 1 hour dB(A) without mitigation	Predicted Maximum Levels LAeqT - 1 hour dB(A) with mitigation
	Without acoustic barrier	With acoustic barrier
NSR1	75	63
NSR2	75	63
NSR3	60	48
NSR4	59	59
NSR5	58	58
NSR6	58	58
NSR7	56	56
NSR8	56	56
NSR9	55	55
NSR10	54	54

NSR11	54	54
NSR12	55	55
NSR13	53	53
NSR14	52	52
NSR15	51	51

10.8.2 Operational Phase

Table 10-14 Predicted noise levels at key locations from operation of the facility

Location id (NSR)	Predicted Maximum Levels LAeqT - 1 hour dB(A) without mitigation	Predicted Maximum Levels LAeqT - 1 hour dB(A) with mitigation
	Without acoustic barrier	With acoustic barrier
NSR1	51	39
NSR2	51	39
NSR3	36	24
NSR4	36	36
NSR5	35	35
NSR6	34	34
NSR7	33	33
NSR8	32	32
NSR9	31	31
NSR10	31	31
NSR11	30	30
NSR12	31	31
NSR13	30	30
NSR14	28	28
NSR15	27	27

10.9 Interactions with other impacts

The interaction between environmental noise and traffic movement has been assessed.

The proposed soil berm with an acoustic fence will also act to mitigate potential visual impacts.

10.10 Bibliography

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

EPA, 2022. Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

EPA, 2016. Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)

International Organization for Standardisation. ISO 1996/1Acoustics – Description and Measurement of environmental noise- Part 1: Basic quantities and procedures

International Organization for Standardisation. ISO 1996-2: Acoustics – Description and Measurement of environmental noise Part 2: Acquisition of data pertinent to land use

International Organization for Standardisation. ISO 1996-3: Acoustics- Description and Measurement of environmental noise Part 3: Application to noise limits

https://Noisetools.net

The National Roads Authority (NRA),2004. Guidelines for the Treatment of Noise and Vibration in National Roads Schemes

BS EN 14388:2015. Road traffic noise reducing devices. Specification

BSI Standards Publication, 2009. BS 5228: Noise Control on Construction and Open Sites Part 1: Code of Practice for Basic Information and Procedures for Noise Control

BSI Standards Publication, 2014. BS 8233:2014 Guidance on sound insulation and noise reduction for buildings

11 AIR QUALITY AND CLIMATE

11.1 Introduction

This chapter evaluates the impact which the Proposed Development may have on Air Quality and Climate as defined in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

The chapter describes the potential impacts to ambient air quality from the proposed Galvanising Plant to be located in Mell, Drogheda, Co. Louth. Particular attention is given to the potential exposure of receptors to airborne pollutants resulting from the development and operation of the subject site. Sensitive receptors, including local business units and residential dwellings within circa 0.50 kilometre (km) of the subject site have been included within the assessment. In addition, a number of ecological sensitive habitats designated under the EU Habitats and Birds Directive were included within the assessment.

The chapter has been developed by Dr. Brian Sheridan B.Sc. (Hons), M.Sc. Eng. Ph.D. Eng. director of Odour Monitoring Ireland Ltd.

The proposed development is for a hot-dip galvanising facility with zinc kettle at Mell, Drogheda, Co. Louth. It is planned to process up to 36,000TPA of steel at the plant (it may be less in the first couple of years of operation). Steel will be processed on-request from customers only and as a result there will be no large stockpiles of steel on the site. All processing will be conducted in-doors. There will be some storage of steel both processed and non-processed out-doors.

The site will cover approximately 3.419 Ha. The location of the site is c. 43 m OD. A detailed description of the proposal is presented in Chapter 2 of the EIAR.

The scope of the study consists of the following components:

- assessment of effects on climate;
- review of background ambient air quality in the vicinity of the application area using available reference data generated by the EPA and other referenced sources;
- appraisal of site-specific baseline air quality monitoring data in the vicinity of the proposed plant;

- identification of the significant substances likely to be released from the proposed plant during construction and when operational;
- review of maximum emission levels and other relevant information needed to inform the dispersion modelling study for identified compounds;
- detailed air dispersion modelling of significant substances expected to be released during the operational phase;
- identification of predicted ground level concentrations (GLC's) of released substances at or beyond the site boundary and at identified sensitive receptors in the local environment;
- a full cumulative assessment of significant releases from the proposed plant taking into account the releases from all other significant sources including EPA licensed facilities within the vicinity of the plant and traffic;
- evaluation of the significance of these predicted concentrations, including consideration of whether these GLC's are likely to exceed the ambient air quality standards and guidelines;
- assessment of other potential air quality impacts such as construction dust and emissions from construction, operational phase traffic and operational process emissions associated with the proposed plant.

11.2 Methodology

This report has been prepared in accordance with the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022). Potential impacts have been described with regard to *Table 3.4* of the guidelines.

11.2.1 Criteria for Rating of Impacts

Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values for "Air Quality Standards" are health or environmental based levels for which additional factors may be considered. For example natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Table 11-1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards, guideline and or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporates European Commission Directive 2008/50/EC which has set limit values for the pollutants such as Oxides of nitrogen, Particulate matter (PM10), Carbon monoxide, Benzene and Sulphur dioxide relevant to the assessment. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and also includes ambient limit values relative to $PM_{2.5}$

Table 11-1 Ambient Air Quality Standards and guideline limit values for Air pollutants considered in assessment

Parameter	Directive / Regulation	Limit Type	*Value*
Carbon monoxide	2008/50/EC and SI 180 of 2011	8 hour limit for the protection of human health	10 mg/Nm³
Nitrogen Dioxide	2008/50/EC and SI 180 of 2011	Hourly limit for protection of human health – not to be exceeded more than 18 times/year-1 hour average	200 µg/m³ NO_2
		Annual limit for protection of human health-Annual	40 µg/m³ NO_2
		Annual limit for protection of vegetation-Annual	30 µg/m³ NO + NO_2
Particulate Matter as PM_{10}	2008/50/EC and SI 180 of 2011	24-hour limit for protection of human health – not to be exceeded more than 35 times/year-24 hour average	50 µg/m³ PM_{10}
		Annual limit for protection of human health-Annual	40 µg/m³ PM_{10}
Particulate matter as $PM_{2.5}$	2008/50/EC and SI 180 of 2011	Annual limit for protection of human health-Annual	25µg/m³ $PM_{2.5}$
Benzene	2008/50/EC and SI 180 of 2011	Annual limit for protection of human health	5 µg/m³
Hydrogen chloride (HCL	TaLuft (German VDI 2006) & Fractional exposure EAL	Hourly limit for protection of human health – not to be exceeded more than 175 times/year-1 hour average	100 µg/m³
		Annual limit for protection of human health-Annual	20 µg/m³
Ammonia	WHO & Fractional exposure limits as per EPA Guidance AG4	1 hr limit for the Protection of human health Annual average for the protection of human health Annual average Critical level – Higher plants Annual average Critical level – sensitive plants	2,500 µg m^{-3} NH_3 180 µg m^{-3} NH_3 3 µg m^{-3} NH_3 1 µg m^{-3} NH_3
Total depositional dust (TDD)	TaLuft / EPA Guidelines	Daily limit averaged over 1 month to minimise nuisance dust at receptor	350 mg/m²/day

Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust which are less than 10µm in size and the EU ambient air quality standards outlined in Section 11.2.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regard to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction and operation phase of a development in Ireland.

However, guideline for dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission levels for dust deposition of 350 mg/m^2/day) averaged over a one month monitoring period at any receptor outside the site boundary. Recommendations from the Department of the Environment, Health and Local Government (DOEHLG, 2004) apply the Bergerhoff limit of 350 mg/m^2/day to the site boundary for quarries. This limit value can be implemented with regard to dust impacts from construction and operation phase of the Proposed Development.

This limit value of 350 mg/m2/day has also been incorporated into Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA, 2006) and the Irish Concrete Federation Environment Code (ICF, 2005).

Gothenburg Protocol

In 1999, Ireland signed the Gothenburg Protocol to the 1979 UN Convention on Long Range Transboundary Air Pollution. In 2010, the Gothenburg Protocol was revised to include national emissions reduction commitments for the main air pollutants to be achieved in 2020 and beyond and to include emissions reduction commitments for $PM_{2.5}$.

European Commission Directive 2001/81/EC and the National Emissions Ceiling Directive (NECD), prescribes the same emissions limits as the 1999 Gothenburg Protocols. A National Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005. The data available from the EPA in 2019 (EPA, 2019) indicated that Ireland complied with the emissions ceilings for SO_2 and NH_3 but failed to comply with the ceiling for NO_x and NMVOCs. Directive (EU) 2016/2284 "On the reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC" was published in December 2016. The Directive applies the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO_2, NO_x, NMVOC, NH_3, $PM_{2.5}$ and CH_4. In relation to Ireland, 2020 emissions targets are 25.5 kt for SO_2 (65% on 2005 levels), 66.9kt for NO_x (49% reduction on 2005 levels), 56.9 kt for NMVOCs (25% reduction on 2005 levels), 112 kt for NH_3 (1% reduction on 2005 levels) and 15.6 kt for $PM_{2.5}$ (18% reduction on 2005 levels). In relation to 2030, Ireland's emission targets are 10.9 kt (85% below 2005 levels) for SO_2, 40.7 kt (69% reduction) for NO_x, 51.6 kt (32% reduction) for NMVOC, 107.5 kt (5% reduction) for NH_3 and 11.2 kt (41% reduction) for $PM_{2.5}$

<u>Climate Agreements</u>

Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the Kyoto Protocol in principle in 1997 and formally in May 2002 (UNFCCC, 1997). For the purposes of the UN burden sharing agreement under Article 4 of the Doha Amendment to the Kyoto Protocol, in December 2012, Ireland agreed to limit the net growth of the six Greenhouse Gases (GHGs) under the Kyoto protocol to 20% below the 2005 level over the period 2013 to 2020 (UNFCCC, 2012). The UNFCCC is continuing detailed negotiations in relation to GHGs reductions and in relation to technical issues such as Emissions Trading and burden sharing. The most recent Conference of the Parties to the Convention (COP27) took place in Egypt from the 6th November 2022 and focused on advancing the implementation of the Paris Agreement. The Paris Agreement was established at COP21 in Paris in 2015 and in an important milestone in terms of international climate change agreements. The Paris agreement was agreed by over 200 nations and has a stated aim of limiting global temperature increase of no more than 2^{o}C above pre-industrial levels with efforts to limit the rise to 1.5^{o}C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions of greenhouse gas emissions will be based on Intended Nationally Determined Contributions (INDCs). Significant progress was also made on elevating adaption onto the same level as action to cut and curb emissions.

In relation to COP27 emission reduction targets for CO_2, Ireland has a target of 51% reduction in economy wide emissions of greenhouse gas emissions by 2030.

11.2.2 Construction phase

<u>Air Quality</u>

There is the potential for a number of emissions to the atmosphere during the construction phase of the proposed development. In particular, the construction and demolition activities may generate quantities of dust in the immediate region of the construction activities and along the route of the haulage trucks.

Climate

The impact of the construction phase of the development on climate was determined by a qualitative and quantitative assessment of the nature and scale of greenhouse gas generating activities associated with the Proposed Development.

11.2.3 Operational Phase

Air Quality

The assessment methodology as a result of impacts associated with traffic involves air dispersion modelling using the UK Design Manual for Roads and Bridges Screening Model (UK Highways Agency, DEFRA, 2007) (Version 1.03c, July 2007), the NO_X to NO_2 Conversion Spreadsheet (UK DEFRA, 2016) (Version 6.1), and following guidance issued by National Roads Authority (NRA, 2008) and UK Highways Agency (2007)).

National Roads Authority guidance states that the assessment must progress to detailed modelling if:

- Concentrations exceed 90% of the air quality limit values when assessed by the screening method; or
- Sensitive receptors exist within 50m of a complex road layout (e.g. grade separated junctions, hills, etc.).

In order to determine which road links need inclusion in the local air quality assessment, they must meet one or more of the following criteria. This criterion is stipulated in the UK Design Manual for Roads and Bridges guidance (UK Highways Agency, 2007),

(i) Road alignment change of 5 m or more,
(ii) Daily traffic flow changes by 1,000 AADT or more,
(iii) HGV flows change by 200 vehicles per day or more,
(iv) Daily average speed changes by 10 km/h or more, or
(v) Peak hour speed changes by 20 km/h or more.

None of the road links impacted by the Proposed Development satisfy any of the criteria outlined above; therefore no assessment using the DMRB model was required for the Proposed Development. For completeness, this was completed and included in the overall impact assessment on Air quality.

With regards to process based emissions during the operation phase, detailed dispersion modelling in accordance with EPA Guidance AG4 was utilised in conjunction with specified emission limit value for the proposed stacks. This was utilised to assess the potential air quality impacts associated with process operation at the facility.

11.3 Characteristics of the development

A detailed description of the proposal is presented in Chapter 2 of the EIAR.

Galvanising is the process of applying a protective zinc coating to steel or iron, to prevent rusting. The proposed (and most common) method is hot-dip galvanising, in which the parts are submerged in a bath of hot molten zinc. In general the galvanising process consists of the following steps:

- Stripping (acid bath) (HCl) to remove zinc and other impurities
- Degreasing (alkaline bath) (TIB Clean-A 300).
- Rinse
- Pickling to remove iron oxides & scales (acid bath) (HCl)
- Rinse
- Fluxing to prepare surfaces for the metallurgical phase by applying a saline layer that facilitates the Iron-Zinc bonding process. (Double salts $ZnCl_2$ & NH_4Cl)
- Galvanising – immersion in molten zinc. Zinc kettle approx. 14.5mx1.8mx3m. The zinc is slowly heated to the melting point of Zn (ca. 450^{0}C) and maintained at that temperature. The Zinc kettle will rarely be shut down.
- Passivation is an optional step to prevent the formation of iron oxides post galvanisation.
- Buffering

The degreaser tank, rinsing tank and fluxing tank all have heating units. The zinc kettle has a high velocity furnace. LPG is used for heating purposes. 2 x 2T LPG tanks will be provided on-site. Acid vapours from the Process Area are vented through a scrubber prior to discharge to atmosphere. Flue gases from the zinc kettle are passed through a heat economizer and ventilator prior to discharge to the atmosphere. White fumes (dust) are generated by the immersion of steel into molten zinc. These fumes are segregated inside the hood above the zinc kettle and are sucked by a ventilation system through a bag filter, before being discharge to atmosphere. Refer to Process Flow Drawing (C216-DR-BCON-CE-203-P0)

11.3.1 Construction phase

Site infrastructure includes a main processing building (approx. 6,048 m2) which includes four main areas

- In-take/out-take
- Process area
- Services
- Staff facilities.

The main building will be in two main sections with maximum heights above finished ground levels of 17.3m and 14.55 m respectively. The proposed building heights are for operational reasons and to accommodate required equipment. The site layout is cognisant of the topography of the site and the location of the local residences. It is expected that there will be no export of soils off-site. Soils not suitable for use as fill within the site will be used to construct non-structural landscaping berms.

Parking facilities for staff and visitors is provided in the northern part of the site. Disabled parking, EV charging points and bicycle parking will be provided. Truck parking facilities will also be provided. Adequate truck parking will be provided for the proposed plant throughput.

A double weighbridge will be provided close to the site entrance.

The development will be accessed from the part-built (currently closed) access road linking Chapel Lane (L6323) to the R132, which will be completed as part of the IDA's plans for the wider lands at this location (see Section 2.3.2). Construction and operational traffic from the proposed development will use the access road linking Chapel Lane to the R132 access on the R132 only. Pedestrian access will also be provided from the site to the access road linking Chapel Lane to the R132.

The main office for the operational phase will be provided beside the entrance. Staff offices and facilities will also be provided in the main building.

Hardstanding around the main building consists of an inner area of concrete and an outer gravelled area. The car park is surfaced with asphalt roadways and permeable hardstanding parking spaces.

Storm water from the site will be managed through infiltration from the northern portion of the site and attenuated discharge to local water course from the southern portion of the site. The storm water management design is provided in the Proposed Drainage Layout Drawing (Ref.: C216-DR-BCON-CE-101).

In respect of mains water and foul water (and possibly also electricity and telecoms depending on the IDA's plans), supporting infrastructure is to be provided by the IDA / IDA in conjunction with other bodies as applicable as part of the IDA's infrastructure enhancement project to support the development of the wider IDA lands at this location (see Section 2.3.5).

Construction works will be conducted between the hours of 08:00 and 18:00 Monday to Friday and 08:00 to 14:00 on Saturdays.

11.3.2 Operational Phase

Galvanising is the process of applying a protective zinc coating to steel or iron, to prevent rusting. The proposed (and most common) method is hot-dip galvanising, in which the parts are submerged in a bath of hot molten zinc. Refer to Drawing C216-DR-BCON-CE-203-P0, Process Flow Drawing. In general the galvanising process consists of the following steps:

- Stripping (acid bath) (HCl) to remove zinc and other impurities
- Degreasing (alkaline bath) (TIB Clean-A 300).
- Rinse
- Pickling to remove iron oxides & scales (acid bath) (HCl)
- Rinse
- Fluxing to prepare surfaces for the metallurgical phase by applying a saline layer that facilitates the Iron-Zinc bonding process. (Double salts $ZnCl_2$ & NH_4Cl)
- Galvanising – immersion in molten zinc. Zinc kettle approx. 14.5mx1.8mx3m. The zinc is slowly heated to the melting point of Zn (ca. 450^0C) and maintained at that temperature. The Zinc kettle will rarely be shut down.
- Passivation is an optional step to prevent the formation of iron oxides post galvanisation.
- Buffering

The degreaser tank, rinsing tank and fluxing tank all have heating units. The zinc kettle has a high velocity furnace. LPG is used for heating purposes. 2 x 2T LPG tanks will be provided on-site. Acid vapours from the Process Area are vented through a scrubber prior to discharge to atmosphere. Flue gases from the zinc kettle are passed through a heat economizer and ventilator prior to discharge to the atmosphere. White fumes (dust) are generated by the immersion of steel into molten zinc. These fumes are segregated inside the hood above the zinc kettle and are sucked by a ventilation system through a bag filter, before being discharge to atmosphere.

With regards to the operation phase of the project, air emissions will be generated from the proposed stacks E2, E3, E4 and E5. This will give rise to emissions of various air pollutants such as Oxides of nitrogen, Particulate matter 10µm and 2.5µm, Hydrogen chloride, and Ammonia. These will be assessed within the impacts of the development section of this chapter (see Section 11.5.5).

11.4 Receiving environment

11.4.1 Sensitive receptors

The site of the proposed development is 3.419Ha. The site comprises generally open scrubland. There are 2 residential properties located adjacent to the western boundary. A minor road known as Chapel Lane runs along the western and southern boundary. The site is bounded to the north by the access road linking Chapel Lane to the R132, and to the east by an open field. The site itself is overgrown with small trees, grasses and brambles. There are existing hedgerows along the eastern, southern and part of the western boundary. The site is completely open along the northern boundary. There are footpaths along the access road linking Chapel Lane to the R132. There are overhead power cables traversing the site. In terms of topography, the site is elevated at the northern end compared to the southern end. There is a level difference of almost 10m. across the site from north to south.

Any houses and commercial developments within a 0.50 km of the site are considered in the assessment for air quality pollutants outlined in Section 11.2.1 of the EIAR. Residents living in proximity to the development can potentially be affected by outlined pollutants. This chapter assesses the potential for the development and outlined pollutants to have an effect on those residents.

Other Chapter studies or elements of the other chapters (e.g. habitats) can consider a wider study area as appropriate and sensitive receptors as outlined within.

The Natura Impact Assessment considers a 15 km zone around the subject site for identification of Natura sites in accordance with The DoEHLG (2009) Guidance on Appropriate Assessment and outlines cumulative impacts with other proposed projects within this study area.

Fifteen sensitive receptor properties and 21 SACs, pNHAs and SPAs in the vicinity of the subject site were detailed within the assessment (see Table 11-2). The location of each receptor is presented in Table 11-2. Designated sites are presented Chapter 5 of this EIAR.

Table 11-2 Residential sensitive receptors, SAC's, pNHA's and SPA's in the vicinity of subject site.

Receptor Identity	Receptor Description	X Coordinate (m)	Y Coordinate (m)
R1	Residential	706692	777335
R2	Residential	706712	777290
R3	Residential	706510	777289
R4	Residential	706938	777510
R5	Residential	706926	777556
R6	Residential	706899	777587
R7	Residential	707098	777411
R8	Residential	707121	777388
R9	Residential	707182	777209
R10	Residential	707187	777164
R11	Residential	707218	777138
R12	Residential	707161	777124
R13	Residential	707201	777059
R14	Residential	706756	777963
R15	Commercial	706372	776714
R16	Boyne Estuary SPA	714709	776997
R17	River Boyne And River Blackwater SAC	680245	772284
R18	River Boyne And River Blackwater SAC	688362	765852
R19	River Nanny Estuary and Shore SPA	716785	770502
R20	Clogher Head SAC	717241	784096
R21	Boyne Coast and Estuary pNHA	714935	776880
R22	Mellifont Abbey Woods pNHA	701154	778050
R23	King William's Glen pNHA	704195	776935
R24	Boyne River Islands pNHA	705467	775622
R25	Dowth Wetland pNHA	704169	774755
R26	Crewbane Marsh pNHA	699046	773474
R27	Boyne Woods pNHA	693500	772610
R28	Duleek Commons pNHA	704138	769442
R29	Thomastown Bog pNHA	700968	768568

Receptor Identity	Receptor Description	X Coordinate (m)	Y Coordinate (m)
R30	Balrath Woods pNHA	698968	763957
R31	Cromwell's Bush Fen pNHA	710057	764814
R32	Laytown Dunes/Nanny Estuary pNHA	716785	770501
R33	Blackhall Woods pNHA	712369	782679
R34	Castlecoo Hill pNHA	714398	782980
R35	Clogher Head pNHA	717241	784096
R36	Barmeath Woods pNHA	708876	788046

11.4.2 Meteorological Data / Climate

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (e.g. traffic levels). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions and stationary sources, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic and stationary based sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ to PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative synoptic weather station collating detailed weather records is Dublin Airport meteorological station, which is located approximately 39 km south of the site. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speed over a five year period (see Figure 11-1). For data collated during the five representative years (2015 to 2019) (Met Eireann, 2021), the predominant wind direction is westerly, south westerly and southerly, with general moderate wind speeds averaging 4 to 5 m/s for the period 1981 to 2010 (source, www.met.ie).

Poor dispersion can occur under certain weather characteristics known as inversions that form in very light or calm wind and stable atmospheric conditions. The wind roses presented in Figure 11-1 identifies that such wind conditions are very infrequent (<6.30% of hours in the years 2015 to 2019 inclusive).

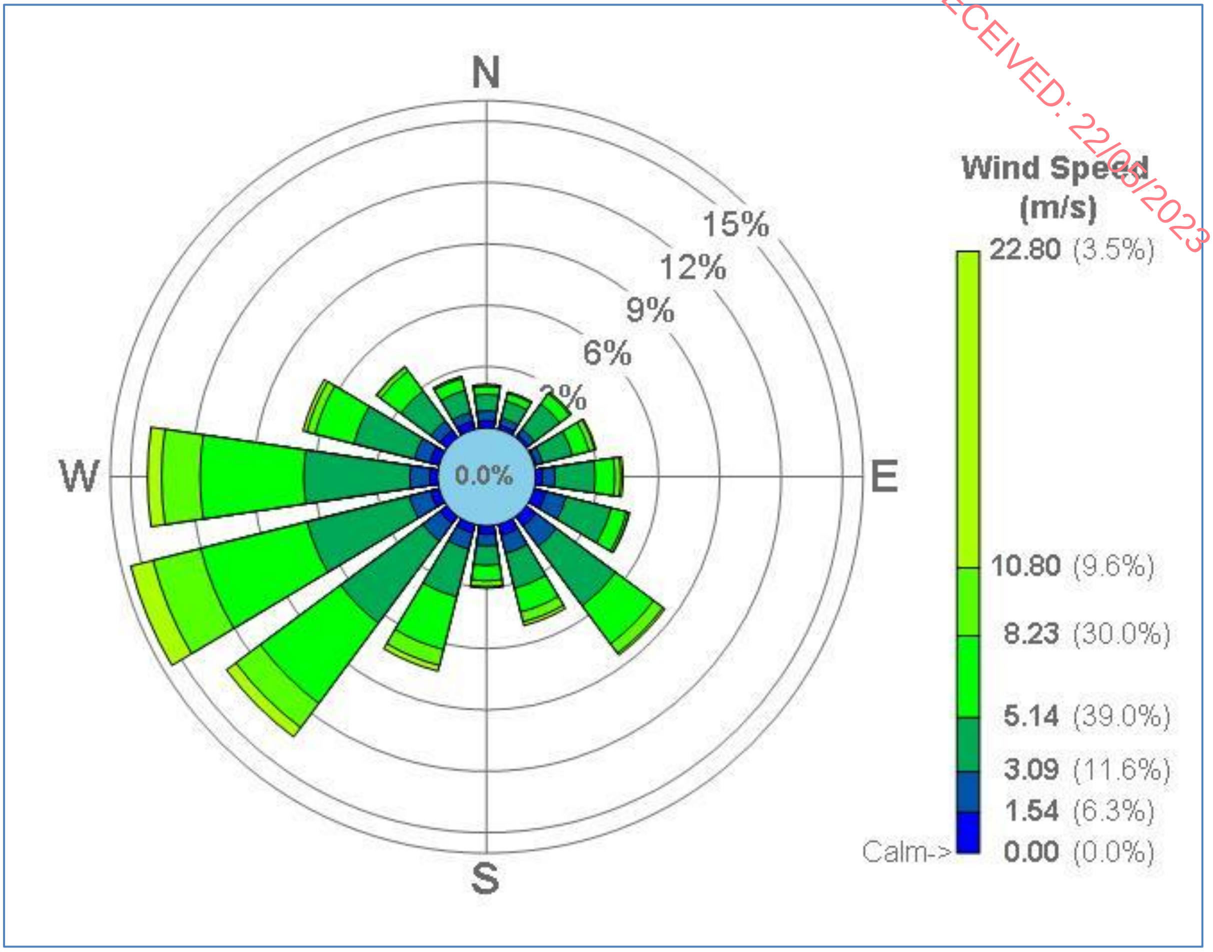

Figure 11-1 Graphical representation of hourly meteorological data Dublin Airport 2015 to 2019 (www.met.ie)

11.4.3 Effects of Climate Change in Ireland

The potential effects of climate change on a global scale have been investigated by the Intergovernmental Panel on Climate Change (IPCC) (www.ipcc.ch). The potential resulting impacts in Ireland are outlined below and include the following:

- Significant increases in winter rainfall, in the order of 10% in the southeast, with a corresponding increase in the water levels in rivers, lakes and soils. Flooding will be more frequent than experienced at present.
- Lower summer rainfall, in the order of 10% in the southern half of the country. Less recharge of reservoirs in the summer leading to more regular and prolonged water shortages than at present.
- An overall annual decrease in rainfall in the east of the country and a resultant decrease in baseline river flows.

- Increased agricultural production, with new crops becoming more viable and potentially reduced agricultural costs. Grass growth could enjoy beneficial effects with an increase of 20% possible with higher temperatures and changes in rainfall patterns.

A paper entitled *Establishing Reference Climate Change Scenarios for Ireland* (Sweeney & Fealy, 2003) identified future climate change scenarios for Ireland. This paper predicts that the average annual temperature in Ireland will increase by 1.5°C by the 2050's with an average increase in summer temperature of 2°C. These temperature increases are predicted to be accompanied by alterations in precipitation levels. The authors estimate an 11% increase in precipitation levels during the winter periods, whilst a more significant increase in precipitation levels during the summer periods were predicted i.e. 25% by the 2070's.

It is important to note that considerable uncertainty is encountered when attempting to predict future climate scenarios. This uncertainty arises due to the difficulties associated with determining future demographic changes, economic development, technological advancement and future emissions of greenhouse gases to the atmosphere. Further difficulty is associated with the complexity of the climatic system and uncertainty surrounding these processes.

It is recognised that Ireland cannot, on its own, prevent or ameliorate the impacts of climate change. However, the 2020 climate and energy package for Europe (I.e. 20-20-20 targets) states a number of greenhouse reduction target to be achieved to include:

- A 20% reduction in EU greenhouse gas emissions from 1990 levels;
- Raising the share of EU energy consumption produced from renewable resources to 20%;
- A 20% improvement in the EU's energy efficiency.

11.4.4 Baseline Air Quality

The EU Air Framework Directive deals with each EU Member State in terms of 'Zones' and 'Agglomerations' for air quality. For Ireland, four zones, A, B, C and D have been defined and are included in the *Air Quality Standards (AQS) Regulations* (SI No 180 of 2011).

- Zone A – Dublin conurbation

- Zone B – Cork conurbation
- Zone C – 21 towns in Ireland with population > 15,000
- Zone D – remaining area of Ireland

Mell and its environs are classified for the purposes of this assessment as falling within Zone D. Where a Zone D level does not exist, a Zone C level will be used for worst case analysis. While there is some availability of recent and historic data for air quality in major urban and rural areas, there is no data available from the national air quality monitoring database for air quality specific to Mell. As such, available data from the EPA Monitoring Site located in a Zone D area has been referenced for Nitrogen Oxides, Benzene and PM_{10} and $PM_{2.5}$ levels (see Table 11-3) and is considered representative of background air quality in the study area. In addition historical baseline data was collated for Hydrogen chloride from available reference sites throughout Ireland (see Table 11-3). This survey was undertaken in order to assess the baseline air quality concentrations of specific key pollutants contained within Table 11-3. The results of data collation are presented on Table 11-3.

Table 11-3 EPA and reference site specific air quality data.

Parameter - Zone D unless otherwise stated for NO_2, PM_{10} & $PM_{2.5}$, HCL and NH_3	Annual average 2020 (µg/m³)	Annual average Year 2021 (µg/m³)	Average Baseline data collected on site (01/11/2022 – 05/12/2022) (µg/m³)	Notes
Average Oxides of nitrogen (NO_2) - Zone D	7.6	7.5	8.47 - 11.06 (Avg. 9.57)	EPA Baseline reports - Air quality in Ireland 2020, 2021
Average Particulate matter PM_{10} - Zone D	11.2	11.9	15.90	EPA Baseline reports - Air quality in Ireland 2020, 2021
Average Particulate matter $PM_{2.5}$ - Zone D	7.8	8.7	9.10	EPA Baseline reports - Air quality in Ireland 2020, 2021
Average Benzene - Zone C	0.04	0.2	0.36 - 0.59 (Avg. Across all stations 0.475)	EPA Baseline reports - Air quality in Ireland 2020, 2021
Hydrogen chloride (HCL)	-	-	0.625	EIAR, Chapter 7, Section 7.23 - Irish Cement Platon, 2009; Attachment 7-1-3-2 Emission impact assessment, 2019; Dublin Waste 2 Energy, Chapter 8, EIA, 2005; Chapter 8, EIAR, 2014 to 2019; EIS, Indaver Waste 2 Energy,
Ammonia (NH_3)	-	-	1.6	Baseline values collated from Dublin Port studies (2018 to 2021), Odour Monitoring Ireland per comm.
Range Total depositional dust (mg/m²/day)	-	-	88 - 164	Collected on site between 01/11/2022 & 05/12/2022 - Range from Locations A1 - A4 - see Figure 11.2

Oxides of nitrogen

Nitrogen is a constituent of both the natural atmosphere and of the biosphere. When industrial metabolism releases nitrogen to the environment it is considered a "pollutant" because of its chemical form: NO, NO_2, and N_2O. In the transportation sector, NOx emissions result from internal combustion engines. In power plants and industrial sources, NOx is produced in boilers. The overwhelming fraction of nitrogen oxide emissions arises from the high temperature combustion of fossil fuels; emissions from metal-processing plants and open-air burning of biomass. Nitrogen dioxide is classed as both a primary pollutant and a secondary pollutant (i.e. pollutants that form in the atmosphere). As a primary pollutant NO_2 is emitted from all combustion processes (such as a gas/oil fired boiler or a car engine). Potentially, the main source of primary NO_2 for the proposed development will be from process emissions from the proposed stacks and vehicle/machinery exhausts.

Continuous monitoring carried out at rural background and site-specific stations indicate an average annual mean concentrations ranging from 7.50 and 9.57 µg/m^3 in 2020, 2021 and 2022 (see Table 11-3) (EPA, 2020, 2021). Sufficient data is available for all stations to observe tends over the periods 2020 to 2022. An analysis of the data suggests upper max average concentrations of no more than 9.57 µg/m^3. Based on these results, a conservative estimate of the background annual average NO_2 concentration in the region of the proposed development is 9.57 µg/m^3.

PM_{10}

Continuous PM_{10} monitoring carried out at rural background and site specific stations showed annual mean concentrations ranging from 11.20 to 15.90 µg/m^3 in 2020, 2021 and 2022 (see Table 11-3) (EPA, 2020, 2021). Sufficient data is available for all stations to observe tends over the periods 2020 to 2022. An analysis of the data suggests upper annual average concentrations of no more than 15.90 µg/m^3. Based on these results, a conservative estimate of the background PM_{10} concentration in the region of the proposed development is 15.90 µg/m^3.

$PM_{2.5}$

Continuous $PM_{2.5}$ monitoring carried out at rural background and site specific stations showed annual mean concentrations ranging from 7.80 to 9.10 µg/m^3 in 2020, 2021 and 2022 (see Table 11-3) (EPA, 2020, 2021). Sufficient data is available for all stations to observe tends over the periods 2020 to 2022. An analysis of the data suggests upper max average concentrations of no more than 9.10 µg/m^3. Based on these results, a conservative estimate of the background annual average $PM_{2.5}$ concentration in the region of the proposed development is 9.10 µg/m^3.

Benzene

The sources associated with individual volatile organic compounds (VOCs) tend to be dependent on the nature of industries in a region. Methane is a naturally occurring VOC derived from plants and animals; it is also generated as a by-product of certain industries. Benzene and other aromatic/alkanes are most often derived from petrol driven vehicle exhausts. Heavier semi-volatile organic compounds are frequently derived from diesel-powered engines.

Continuous Benzene monitoring carried out at rural background and site specific stations showed annual mean concentrations ranging from 0.04 to 0.59 µg/m^3 in 2020, 2021 and 2022 (see Table 11-3) (EPA, 2020, 2021). Sufficient data is available for all stations to observe tends over the periods 2020 to 2022. An analysis of the data suggests upper average concentrations of no more than 0.59 µg/m^3. Based on these results, a conservative estimate of the background annual average Benzene concentration in the region of the proposed development is 0.59 µg/m^3.

Hydrogen chloride

The sources associated with Hydrogen chloride tend to be dependent on the nature of industries in a region. It is generated as a by-product of certain industries including combustion of chlorine rich materials.

There are no continuous monitoring stations for Hydrogen chloride in Ireland. Data collated in this report related to site specific baseline studies carried out at a number of proposed developments as referenced in Table 11-3.

Static Hydrogen chloride monitoring carried out at these site specific stations showed annual mean concentrations ranging from 0.010 to 2.20 µg/m^3 (see Table 11-3). Sufficient data is available for all stations to observe tends over the monitoring period. An analysis of the data suggests upper average concentrations of no more than 0.625 µg/m^3. Based on these results, a conservative estimate of the background annual average Benzene concentration in the region of the proposed development is 0.625 µg/m^3.

Ammonia

Ammonia is an inorganic compound of nitrogen and hydrogen with the formula NH_3. Ammonia is an colourless gas with a distinct pungent smell. Biologically, it is a common nitrogenous waste, particularly among aquatic organisms, and it contributes significantly to the nutritional needs of terrestrial organisms by serving as a precursor to 45% of the world's food and fertilizers. Around 70% of ammonia is used to make fertilisers in various forms and composition, such as urea and Diammonium phosphate. Ammonia in pure form is also applied directly into the soil.

Ammonia, either directly or indirectly, is also a building block for the synthesis of many pharmaceutical products and is used in many commercial cleaning products. It is mainly collected by both air and water following dispersion.

There are no continuous monitoring stations for Ammonia in Ireland. Data collated in this report related to site specific baseline studies carried out in and around Dublin Port as referenced in Table 11-3.

Static Ammonia monitoring carried out at these site specific stations showed annual mean concentrations up to 1.60 µg/m^3 (see Table 11-3). Sufficient data is available for all stations to observe tends over the monitoring period. An analysis of the data suggests upper average concentrations of no more than 1.60 µg/m^3. Based on these results, a conservative estimate of the background annual average Ammonia concentration in the region of the proposed development is 1.60 µg/m^3.

11.4.5 Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance documents "Significance in air quality Nov 2009 and Guidance on the Assessment of Mineral Dust Impact for Planning" (2016) prior to assessing the impacts of air pollutants from a Proposed Development, the sensitivity of the area must first be assessed as outlined below.

With regards to dust nuisance both receptors sensitivity and proximity to proposed works area are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time.

In terms of receptor sensitivity to dust spoiling, there are a number of sensitive receptors located less than 100 m from the proposed facility (see Table 11-4). Based on the IAQM criteria outlined in Table 11-4, the worst-case sensitivity of the area to dust spoiling is considered to be **Medium**.

Table 11-4 Sensitivity of the Area to Dust Soiling Effects on People and Property.

Receptor sensitivity	Number of receptors	Distance from source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	**Medium**	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

In addition to sensitivity to dust spoiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptors sensitivity based on type (residential receptor are classified as sensitive) and the number of receptors affected within various distance bands from the works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the Proposed Development is estimated to be 15.90 $\mu g/m^3$ and there are between 1-10 sensitive receptors located less than 100 m from the proposed development works. Based on the IAQM criteria outlined in Table 11-5, the worst case sensitivity of the area to human health is considered **Low**.

Table 11-5 Sensitivity of the Area to Human Health Impacts

Receptor sensitivity	Annual Mean PM_{10} Concentration	Number of receptors	Distance from source (m)			
			<20	<50	<100	<200
High	<24 $\mu g/m^3$	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	<24 $\mu g/m^3$	>10	Low	Low	Low	Low
		1-10	Low	Low	**Low**	Low
Low	<24 $\mu g/m^3$	>1	Low	Low	Low	Low

With regards to describing the impact magnitude for change in ambient air pollutant concentrations as a percentage of Objective / Limit value / Environmental Assessment Level, this can be described depending on the magnitude of change. Table 11-6 presents the different categories associated with this description (IAQM, 2009).

Table 11-6 Generic Basis of Definition of Impact Magnitude for Changes in Ambient Pollutant Concentrations as Percentage of Objective/Limit Value/Environmental Assessment Level

Magnitude of change	Annual Mean
Large	Increase / Decrease >10%
Medium	Increase / Decrease 5 - 10%
Small	Increase / Decrease 1 - 5%
Imperceptible	Increase / Decrease <1%

11.5 Potential Impacts of the development

11.5.1 Do Nothing'

The baseline survey undertaken as part of this assessment suggests that air quality in the vicinity of the application area is expected to be good with typical levels of pollutants for a rural area. All pollutant levels are within the relevant Irish and EU limits. In the event that the development does not proceed it is likely that air quality will remain the same and/or slightly improve in years to come with improvements in technology.

11.5.2 Construction Phase

Direct

The following sections describe the potential impacts to air quality resulting from the construction phase of the proposed plant. The impacts have been assessed on a local scale to determine impacts on human health and ecological receptors. The aspects considered include:

- Construction dust from the building of structures on the site,
- Construction dust and its potential to impact on sensitive receptors and to cause an environmental nuisance,
- Construction traffic emissions and their potential for impacts on sensitive receptors.

The impacts are assessed in the following sections with respect to the relevant assessment criteria where appropriate.

Construction Dust

There is limited potential impact on air quality during the construction phase of the Proposed Development from construction dust emissions and the potential for nuisance dust. While

construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts, etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction and the relative location of receptor to the site activities.
It is important to note that the potential impacts associated with the construction phase of the Proposed Development are short-term in nature (associated with excavation, soil movement and construction within the development). When the dust minimisation measures detailed in the mitigation section (see Section 11.6.3) of this chapter are implemented, fugitive emissions of dust from the site will not be significant and will pose no nuisance at nearby receptors.

Table 11-7 presents the distances within which dust could be expected to result in a nuisance from construction sites for impacts such as soiling (dust nuisance), PM_{10} deposition and vegetation effects. This data has been taken from the National Roads Authority (NRA) *Guidelines (2008) for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* and is considered a worst case assessment. These distances present the potential for dust impact with standard mitigation in place.

Detail of proposed mitigation measures to be implemented as part of the construction phase of the project are presented under the Construction Phase Mitigation section of this chapter.

Table 11-7 Assessment criteria for the impact of dust from construction, with standard mitigation in place

Source		Potential distance for significant effects (distance from source)		
Scale	**Description**	**Soiling**	**PM_{10}**	**Vegetation effects**
Major	Large construction sites with high use of haul roads	100m	25m	25m
Moderate	Moderate sized construction sites with moderate use of haul roads	50m	15m	15m
Minor	Minor construction sites with minor use of haul roads	25m	10m	10m

Source: National Roads Authority, 2006.

The construction phase of this proposal is deemed for the purposes of this assessment to be of a minor scale (see Table 11-7). Using this screening assessment tool, at a minor construction site there is a risk that dust may cause an impact at sensitive receptors within 25m of the source of the dust generated. The nearest residential sensitive receptors to the centre of the subject site is located at a distance of over 25m from the centre of the site, therefore, the impact from construction activities can be considered to be minor.

All sensitive habitats are located at a distance greater than 50m from the emission source as a result the impact on habitats will be imperceptible.
A Construction Environmental Management Plan (CEMP) incorporating dust mitigation measures will further reduce any impacts significantly and this will be implemented as part of the proposed development.

Construction Traffic Emissions

Emissions associated with construction traffic can impact on local air quality. In particular, the proposed routes used for deliveries and any sensitive receptors that line these routes may experience impacts to local air quality.

The potential impact of construction traffic associated with this proposal was estimated as a worst case Annual Average Daily Traffic (AADT) scenario of less than 200 with a mean traffic speed of 20km/hr. The detailed results of the modelling exercise are presented in Table 11-8. Impacts associated with construction traffic will be negligible when compared with the impact criteria contained in Table 11-6.

Table 11-8 Predicted contribution of air pollutants to baseline air quality as a result of construction traffic.

Link location	Benzene and Carbon monoxide Annual mean (µg/m³)	Oxides of nitrogen Annual mean (µg/m³)	Particulate matter 10um	
			Annual mean (µg/m³)	Days > 50 (µg/m³)
Worst case receptor 5m from road centreline on any roadway	0.0001	0.70	0.05	0

Indirect

There are no indirect emissions to air associated with construction.

11.5.3 Operational stage

Air quality impacts may arise from process based emissions and traffic movements associated with the operational phase of the proposed plant. Traffic based air quality emissions will result from traffic making deliveries and collections to and from the proposed plant and employee traffic movements.

Direct impacts

Traffic

The detailed information provided in the Traffic and Transport Chapter (see Chapter 9 of the EIAR) has been used to identify whether any significant impact on sensitive receptors will occur. The traffic information has been inputted into the Design Manual for Roads and Bridges (DMRB), Volume 11 (ver. 1.03c) model. This model was prepared by the United Kingdom Department of Transport, the Scottish Office of Industrial Development, the Welsh Office and the Department of Environment for Northern Ireland as a screening tool to assess worst-case air quality impact associated with traffic movements.

The screening model uses a worst-case scenario in calculating emissions. The emission factors used for each pollutant are intentionally set to biased and to overestimate the actual emission rate. In addition, wind speeds are assumed to be 2 ms^{-1} (approximately 3.90 knots compared to a mean wind speed of between 4 to 5 ms^{-1} at the nearest Met station (Dublin Airport Met Station)). Emission rates predicted as a result of traffic are added to the cumulative emissions generated by the proposed plant's scheduled emission points and baseline data. This is considered a worst case assessment of likely impact. It can therefore be assumed with confidence that traffic related air pollution will not arise if the model does not identify any issues.

Traffic figures have been assessed using Annual Average Daily Traffic (AADT) figures. The Heavy Goods Vehicle (HGV) percentage was taken from the traffic assessment. As the average speed of vehicles has a significant effect on the generation of pollutants, calculations are carried out at a worst case traffic speed scenarios. The speed used is 20 km hr^{-1}, to represent gridlock conditions so as to assess the worst case scenario. In addition, it was assumed within the model that the sensitive receptor was located within 5m of the road centreline, again to represent worst case conditions.

Traffic: Output Data from Traffic Air Quality Model

Table 11-9 presents the results of the worst case conservative traffic air quality modelling data, performed in order to ascertain the likely air quality impact as a result of a change to traffic patterns generated during the operational phase of the subject site.

As can be observed, there is no significant increase in the air quality impact of named pollutants as a result of increased baseline traffic numbers in 2025 with only a slight increase occurring in pollutant concentration predicted 5m from the road centreline.

Based on the IAQM (2009) guidance document, impacts of air quality can be considered **Negligible** and **Imperceptible**. With regards to human health impacts, all parameters remain well within the Air Quality Limit values contained in Table 11-1 for the protection of human health and thus impacts can be considered **Negligible** to both the environment and human health.

Table 11-9 Predicted contribution of air pollutants as a result of operation traffic - do-something scenario (2023 - 2025).

Year	Worst case Assessment location 5 m from road centreline	
	Worst case location where maximum traffic movement occurs	
Emissions as a result of operation phase traffic **2025 – Do something**	Carbon monoxide Annual mean (µg/m³)	0.0022
	Benzene Annual mean (µg/m³)	0.0022
	Oxides of nitrogen Annual mean (µg/m³)	0.30
	Particulate matter 10um – Annual mean (µg/m³)	0.03
	Particulate matter 10um – Days > 50 (µg/m³)	0

As can be observed, there is no significant increase in the air quality impact of named pollutants as a result of increased baseline traffic numbers when the development occurs with only a slight increase occurring in pollutant concentration predicted 5m from the road centreline.

In terms of the 'do something scenario' there is a slight increase in some pollutant concentration in the order of less than 1% of the impact criterion (see Table 11-6) which is considered to be imperceptible. When this increase is added to baseline data presented in Table 11-3 for each named pollutant, emissions will remain well within the air quality limits presented in Table 11-1 for the protection of human health.

<u>Scheduled emission points – Emissions from process operations</u>

The relative location of the four scheduled emission points within the subject site is presented in Figure 11.3 in Appendix 15.

- Proposed new emission points E2, E3, E4 and E5 vented through individual stacks 20m above finished floor levels;

Air pollutants as detailed in Table 11-3 from the proposed scheduled emission points were examined utilising regulatory emission limit values that are applied to emission points E2, E3, E4 and E5. The selection of these pollutants is based on typical pollutant types expected from such processes and as recommended for assessment by the Irish EPA. No other pollutant types are expected from the scheduled emission points located on site and therefore this assessment is considered complete with respect to the assessment of pollutant types.

Cumulative air quality impacts were accounted for through utilisation of a combination of EPA and site specific baseline data plus predicted air quality impacts as a result of the operation of the proposed scheduled emission points to be located within the facility boundary and increased emissions as a result of increased proposed traffic numbers arising from the proposed facility operation.

The proposed emission point characteristics utilised within the dispersion modelling air quality assessment are contained in Table 11-10. The predicted impacts as a result of operation of scheduled emission points at the proposed plant for air quality was examined utilising air quality emission rate data as presented in Table 11-11, in accordance with procedures and methods contained in the following publications:

- *H4 Odour Management, Guidance Parts 1 and 2*, Environment agency, UK, 2011.
- *Air Dispersion Modelling from Industrial Installations Guidance Note* (AG4), EPA 2010, updated 2020).
- *TaLuft 2002* - First General Administrative Regulation Pertaining the Federal Immission Control Act (Technical Instructions on Air Quality Control, 2006)

This data was inputted into a dispersion model in order to predict the impacts of named pollutant emissions from scheduled emissions points located within the facility boundary. AERMOD Prime (22112) and 5 years of hourly sequential meteorological data (Dublin Airport 2015 to 2019) representative of the study area were utilised within the dispersion model with the worst case year Dublin Airport 2019 used for data presentation.

Dispersion Model AERMOD Prime

The AERMOD model was developed through a formal collaboration between the American Meteorological Society (AMS) and U.S. Environmental Protection Agency (U.S. EPA). AERMOD is a Gaussian plume model and replaced the ISC3 model in demonstrating compliance with the National Ambient Air Quality Standards (Porter et al., 2003). AERMIC (USEPA and AMS working group) is emphasising development of a platform that includes air turbulence structure, scaling, and concepts; treatment of both surface and elevated sources; and simple and complex terrain. The modelling platform system has three main components: AERMOD, which is the air dispersion model; AERMET, a meteorological data pre-processor; and AERMAP, a terrain data pre-processor (Cora and Hung, 2003).

Model Assumptions

The approach adopted in this assessment is considered a worst-case investigation in respect of emissions to the atmosphere from the proposed scheduled emission points to be located within the operational plant. These predictions are therefore most likely to overestimate the Ground Level Concentrations (GLC's) that may actually occur for each modelled scenario. The assumptions are summarised and include:

- All emissions were assumed to occur at maximum potential emission concentration and mass emission rates for each scenario and were assumed to occur for 100% of an operating year, simultaneously (when the proposed plant is in operation);

- Five years of hourly sequential meteorological data from Dublin Airport 2015 to 2019 inclusive was used in the modelling study which will provide statistical significant results in terms of the short and long term assessment criteria (i.e. hourly, percentile and annual average values). The worst case year 2019 was used for data analysis, this is in keeping with guidance presented in AG4. In addition, AERMOD incorporates a meteorological pre-processor AERMET PRO. The AERMET PRO meteorological pre-processor requires the input of surface characteristics, including surface roughness (z0), Bowen Ratio and Albedo by sector (i.e. dispersion modelling calculation terms) and season, as well as hourly observations of wind speed, wind direction, cloud cover, and temperature. The values of Albedo, Bowen Ratio and surface roughness depend on land-use type (e.g., urban, cultivated land etc.) and vary with seasons and wind direction. The assessment of appropriate land-use type was carried out to a distance of 10km from the meteorological station for Bowen Ratio and Albedo and to a distance of 1km for surface roughness for the proposed site in line with USEPA recommendations.
- AERMOD Prime (22112) dispersion modelling was utilised throughout the assessment;
- All building wake affects were assessed within the dispersion model (i.e. the effects that the relative height of the building structure can have on the disperison from the emission points);
- Normal breathing height was established at 1.80m within the dispersion model;
- Thirty six individual sensitive receptors were included within the model in order to provide specific predicted ground level concentrations at these locations.
- m spaced specific for the site and 10 m spaced Topographical data from OSI was inputted into the model in order to take account of any significant terrain changes and rolling terrain in the vicinity of the site (which is the case in this instance). A total grid area of 16 square Km was utilised within the model. 20m and 200 m spacing was used within the Cartesian grid providing a total grid receptor number of 2,158.
- Baseline data was used in conjunction with the predicted process emissions. In addition traffic contribution values gathered from a review of available literature for EPA monitoring sites contained in Air Quality in Ireland 2020 and 2021 was used to assess overall proposed impacts.

Air quality impact criteria Table 11-1 outlines the air quality impact criterion utilised to assess the impacts associated with the operation of the facility scheduled emission points.

Various averaging and percentile analysis to include 1 hour, Annual average and Percentile analysis was performed on the dispersion model output file to allow comparison with these assessment criteria.

Meteorological Data

Five years of hourly sequential meteorological data was chosen for the modelling exercise (i.e. Dublin Airport 2015 to 2019 inclusive). A schematic wind rose and tabular cumulative wind speed and directions of all five years are presented in Figure 11-1. All five years of meteorological data was screened to provide statistically significant output results from the dispersion model. The worst case year 2019 was used for data presentation. This is in keeping with national and international recommendations on quality assurance in operating dispersion models and will provide a worst case assessment of predicted ground level concentrations based on the input emission rate data. Surface roughness, Albedo and Bowen ratio were assessed and characterised around Dublin Airport Met Station for AERMET Pro processing.

Terrain Data

Topography effects were accounted for within the dispersion modelling assessment as terrain was considered complex in the vicinity of the site. 5 m site specific and 10m spaced in order to allow for the characteristics of terrain to be accounted for in the model. A total fine grid area of 16.0 km sq was examined within the dispersion modelling assessment giving a total receptor grid number of 2,158 receptor points in the assessment area. In addition, specific habitats receptors up to 15 km from the site (as the crow flies) were also included. These were also established at their specific terrain elevation for accuracy.

Building Wake Effects

Building wake effects are accounted for in modelling scenarios through the use of the Prime algorithm (i.e. all building features located within the proposed facility plume dispersion at short distances from the source and can significantly increase GLC's in close proximity to the proposed plant. All building structures, stack heights and orientations were inputted into the dispersion model in order to allow for wake effects to be taken in to account in the calculations. The latest Building Profile Input Programme (BPIP) version (04274) was utilised in the analysis.

Input Source Characteristics for Dispersion Model

Input source characteristics for the dispersion model are specified within Table 11-10. Each of the four scheduled emission points are detailed within this Table to include, emission point location, height, stack tip diameter, gas exit velocity, exhaust actual airflow volume, worst case building / structure height etc. This data was utilised in conjunction with the emission rate data for air pollutants as detailed in Table 11-11 in order to predict the worst case GLC over the specified receptor grid area detailed in Section 11.5.3 - Terrain Data

Table 11-10 Input source characteristics for four scheduled emission point for Dispersion modelling assessment.

Parameter	Proposed stack E2 See Figure 11.2 (Appendix 15)	Proposed stack E3 See Figure 11.2 (Appendix 15)	Proposed stack E4 See Figure 11.2 (Appendix 15)	Proposed stack E5 See Figure 11.2(Appendix 15)
X coordinate (m)	706733	706742	706760	706768
Y coordinate (m)	777336	777340	777329	777352
Base level (m)	43	43	43	43
Stack height A.G.L (m)	20	20	20	20
Stack tip diameter (m)	0.60	0.60	1.50	1.60
Stack tip area (m2)	0.28	0.28	1.77	2.01
Temperature	473.15	473.15	308.15	308.15
Volume flow rate (Nm3/hr, dry gas)	5,250	5,250	80,000	90,000
Moisture content (%)	7	7	2	2
Oxygen content (%)	6	6	20.95	20.95
Volume flow rate (Am3/hr, dry gas)	11,741	11,741	90,251	101,532
Efflux velocity (m/s)	11.53	11.53	14.18	14.03
Worst case building height (m)	17	17	17	17

The overall air quality emission data for Oxides of nitrogen, Total particulates (as PM_{10} and $PM_{2.5}$), Hydrogen chloride and Ammonia from the identified processes is presented in Table 11-11. The relative location of each emission point is presented in Figure 11.3 in Appendix 15. This data was inputted into the dispersion model AERMOD Prime 22112 along with meteorological data (i.e. Dublin Airport 2015 to 2019 inclusive), terrain, building and source characteristics as described within to allow for the examination of predicted air pollutant levels for maximum predicted regime at each of the identified sensitive receptors presented in Table 11-2.

For modelling classical air pollutants and in order to obtain the predicted environmental concentration (PEC), baseline data was added to the predicted process emission at ground level. In relation to the predicted annual averages, the ambient background concentration was added directly to the predicted process concentration. However, in relation to the predicted short-term peak 1 hr concentrations, twice the background concentration level was added to the predicted environmental concentration (PEC) (AG4, EPA, 2020). In addition emissions as a result of traffic were taken into account in the final predictions at the worst case sensitive receptor so as to remain conservative.

In modelling air dispersion of NOx from combustion sources, the source term should be expressed as NO_2, (e.g., NOx mass (expressed as NO_2)). A portion of the exhaust air comprises NO while the remainder comprises NO_2. NO will be converted in the atmosphere to NO_2 but this will depend on a number of factors to include Ozone and VOC concentrations. In order to take account of this conversion the following screening can be performed. The worst case screening scenario treatment that can be applied to results is:

- 50% for short-term predicted concentration value and
- 100% for long-term predicted concentration value

These can be considered to assess compliance with the relevant air quality objective.

This is in accordance with recommendations from the Environmental Agency UK and contained in EPA Guidance AG4 for the dispersion modelling of NO_2 emissions from combustion processes (AG4, EPA 2020). In order to remain conservative, these treatments were not applied to the result

Table 11-11 Mass emission rate input data to dispersion model for considered pollutants.

Emission point ID	Pollutant ID	Volume flow rate (Nm^3/hr)	Pollutant (mg/Nm^3)	Mass emission rate (g/s)
E2 & E3	Oxides of nitrogen (273.15K, 101.3 KPa, dry gas, ref 3% O2)	5,250	100	0.146
E4	Hydrogen chloride (273.15K, 101.3 KPa, wet gas)	80,000	5	0.111
	Total Particulates (273.15K, 101.3 KPa, wet gas)	80,000	5	0.111
E5	Hydrogen chloride (273.15K, 101.3 KPa, wet gas)	90,000	5	0.125
	Total Particulates (273.15K, 101.3 KPa, wet gas)	90,000	5	0.125
	Ammonia (273.15K, 101.3 KPa, wet gas)	90,000	15	0.375

Table 11-12 presents the maximum predicted air pollutant ground level concentration values in the vicinity of the proposed plant when the proposed stacks are in operation. The predicted ground level concentration at each of the specified receptors is presented to include both residential and habitats receptors. The worst case predicted value at any of the sensitive receptors and habitats is compared against the prescribed environmental assessment level as presented in Table 11-1.

As can be observed in Table 11-12, the maximum predicted GLC of Oxides of nitrogen, Particulate matter as PM_{10} and $PM_{2.5}$, Total Volatile organic compounds as Benzene, Hydrogen chloride, and Ammonia, with baseline values and predicted traffic related emissions is well within the air quality limit values presented in Table 11-1.

The predicted maximum ground level concentration including baseline and traffic related emissions for the maximum 99.79%ile 1 hr Oxides of nitrogen GLC is less than or equal to 20.01% of the impact criterion (see Table 11-12).

The predicted maximum ground level concentration including baseline and traffic related emissions for the maximum Annual average Oxides of nitrogen GLC is less than or equal to 27.96% of the impact criterion for the protection of human health. The predicted maximum ground level concentration including baseline emissions for the maximum annual average Oxides of nitrogen GLC is less than or equal to 31.93% of the impact criterion for the protection of habitats. With regards to the significance of change, this is considered small (see Table 11-12).

The predicted maximum ground level concentration including baseline and traffic related emissions for the maximum 90.40%ile 24 hr Total particulates as PM_{10} GLC is less than or equal to 36.23% of the impact criterion (see Table 11-12).

The predicted maximum ground level concentration including baseline and traffic related emissions for the maximum Annual average Total particulates as PM_{10} GLC is less than or equal to 41.49% of the impact criterion. With regards to the significance of change, this is considered small (see Table 11-12).

The predicted maximum ground level concentration including baseline and traffic related emissions for the maximum Annual average Total particulates as $PM_{2.5}$ GLC is less than or equal to 39.18% of the impact criterion. With regards to the significance of change, this is considered small (see Table 11-12).

The predicted maximum ground level concentration including baseline emissions for the maximum 98%ile 1 hr Hydrogen chloride GLC is less than or equal to 9.52% of the impact criterion (see Table 11-12).

The predicted maximum ground level concentration including baseline emissions for the maximum Annual average Hydrogen chloride GLC is less than or equal to 6.45% of the impact criterion. With regards to the significance of change, this is considered small (see Table 11-12).

The predicted maximum ground level concentration including baseline emissions for the maximum 100%ile 1 hr NH_3 GLC is less than or equal to 1.38% of the impact criterion (see Table 11-12).

The predicted maximum ground level concentration including baseline emissions for the maximum Annual average Ammonia GLC is less than or equal to 1.41% of the impact criterion. With regards to the significance of change, this is considered imperceptible (see Table 11-12).

Table 11-12 Predicted ground level concentrations (GLC's) at each identified sensitive receptor for modelled air pollutants.

Receptor ID	Receptor description	X coordinate (m)	Y coordinate (m)	Scenario 1 - Process contribution 99.79%ile 1 hr NO_2 conc. (ug/m3)	Scenario 2 - Process contribution Annual average NOx conc. (ug/m3)	Scenario 3 - Process contribution 90.4%ile PM10 conc. (ug/m3)	Scenario 4 - Process contribution Annual average PM10 conc. (ug/m3)	Scenario 5 - Process contribution Annual average PM2.5 conc. (ug/m3)	Scenario 6 - Process contribution 98%ile 1 hr HCL (ug/m3)	Scenario 7 - Process contribution Annual average HCL (ug/m3)	Scenario 8 - Process contribution 100%ile 1 hr NH3 (ug/m3)	Scenario 9 - Process contribution Annual average NH3 (ug/m3)
R1	Residential	706692	777335	6.5914	0.2528	2.1568	0.6641	0.6641	8.1368	0.6641	25.6960	0.9317
R2	Residential	706712	777290	20.2737	0.8468	1.6935	0.6081	0.6081	8.4668	0.6081	31.1796	0.9144
R3	Residential	706510	777289	6.8053	0.4775	0.6954	0.2148	0.2148	2.5565	0.2148	10.7957	0.2928
R4	Residential	706938	777510	12.9050	1.3148	1.4402	0.5017	0.5017	3.8126	0.5017	7.4405	0.6693
R5	Residential	706926	777556	11.1107	1.0017	1.0859	0.3890	0.3890	3.1645	0.3890	7.4488	0.5305
R6	Residential	706899	777587	9.6711	0.8272	0.8876	0.3149	0.3149	2.8256	0.3149	6.8672	0.4275
R7	Residential	707098	777411	11.7143	0.8970	0.9541	0.4024	0.4024	2.6514	0.4024	6.8397	0.5620
R8	Residential	707121	777388	10.8643	0.8092	0.9131	0.3728	0.3728	2.4862	0.3728	8.7953	0.5236
R9	Residential	707182	777209	9.3530	0.4296	0.5330	0.1982	0.1982	1.6515	0.1982	7.9102	0.2751
R10	Residential	707187	777164	8.5811	0.3602	0.4306	0.1611	0.1611	1.3755	0.1611	7.9475	0.2222
R11	Residential	707218	777138	7.2039	0.2948	0.3472	0.1326	0.1326	1.1750	0.1326	7.7227	0.1833
R12	Residential	707161	777124	7.7603	0.3237	0.3894	0.1449	0.1449	1.3498	0.1449	9.1499	0.1988
R13	Residential	707201	777059	5.6160	0.2362	0.2949	0.1042	0.1042	0.9786	0.1042	6.7899	0.1429
R14	Residential	706756	777963	3.5630	0.1204	0.1247	0.0478	0.0478	0.4952	0.0478	2.9009	0.0674
R15	Commercial	706372	776714	1.5887	0.0603	0.0606	0.0248	0.0248	0.2145	0.0248	1.7205	0.0341
R16	Boyne Estuary SPA	714709	776997	0.1096	0.0025	0.0028	0.0011	0.0011	0.0075	0.0011	0.2131	0.0016
R17	River Boyne And River Blackwater SAC	680245	772284	0.0190	0.0003	0.0003	0.0001	0.0001	0.0008	0.0001	0.0616	0.0002
R18	River Boyne And River Blackwater SAC	688362	765852	0.0059	0.0002	0.0002	0.0001	0.0001	0.0005	0.0001	0.0621	0.0001
R19	River Nanny Estuary and Shore SPA	716785	770502	0.0583	0.0010	0.0009	0.0004	0.0004	0.0026	0.0004	0.1963	0.0006
R20	Clogher Head SAC	717241	784096	0.0641	0.0015	0.0016	0.0007	0.0007	0.0050	0.0007	0.1448	0.0009
R21	Boyne Coast and Estuary pNHA	714935	776880	0.1010	0.0024	0.0026	0.0010	0.0010	0.0070	0.0010	0.2189	0.0015
R22	Mellifont Abbey Woods pNHA	701154	778050	0.3122	0.0039	0.0050	0.0015	0.0015	0.0152	0.0015	0.4417	0.0021
R23	King William's Glen pNHA	704195	776935	0.6207	0.0094	0.0116	0.0035	0.0035	0.0374	0.0035	0.4509	0.0048
R24	Boyne River Islands pNHA	705467	775622	0.1870	0.0077	0.0063	0.0030	0.0030	0.0237	0.0030	0.3027	0.0041
R25	Dowth Wetland pNHA	704169	774755	0.0840	0.0032	0.0028	0.0012	0.0012	0.0086	0.0012	0.1995	0.0017
R26	Crewbane Marsh pNHA	699046	773474	0.0212	0.0009	0.0007	0.0003	0.0003	0.0023	0.0003	0.0749	0.0005
R27	Boyne Woods pNHA	693500	772610	0.0162	0.0005	0.0005	0.0002	0.0002	0.0013	0.0002	0.0754	0.0003
R28	Duleek Commons pNHA	704138	769442	0.0314	0.0011	0.0008	0.0004	0.0004	0.0021	0.0004	0.1757	0.0006

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Table 11-12 continued. Predicted ground level concentrations (GLC's) at each identified sensitive receptor for modelled air pollutants.

Receptor ID	Receptor description	X coordinate (m)	Y coordinate (m)	Scenario 1 - Process contribution 99.79%ile 1 hr NO_2 conc. (ug/m3)	Scenario 2 - Process contribution Annual average NOx conc. (ug/m3)	Scenario 3 - Process contribution 90.4%ile PM10 conc. (ug/m3)	Scenario 4 - Process contribution Annual average PM10 conc. (ug/m3)	Scenario 5 - Process contribution Annual average PM2.5 conc. (ug/m3)	Scenario 6 - Process contribution 98%ile 1 hr HCL (ug/m3)	Scenario 7 - Process contribution Annual average HCL (ug/m3)	Scenario 8 - Process contribution 100%ile 1 hr NH3 (ug/m3)	Scenario 9 - Process contribution Annual average NH3 (ug/m3)
R29	Thomastown Bog pNHA	700968	768568	0.0169	0.0006	0.0004	0.0002	0.0002	0.0013	0.0002	0.1270	0.0003
R30	Balrath Woods pNHA	698968	763957	0.0106	0.0003	0.0003	0.0001	0.0001	0.0007	0.0001	0.1069	0.0002
R31	Cromwell's Bush Fen pNHA	710057	764814	0.0286	0.0006	0.0006	0.0002	0.0002	0.0014	0.0002	0.1288	0.0003
R32	Laytown Dunes/Nanny Estuary pNHA	716785	770501	0.0583	0.0010	0.0009	0.0004	0.0004	0.0026	0.0004	0.1962	0.0006
R33	Blackhall Woods pNHA	712369	782679	0.1691	0.0031	0.0034	0.0013	0.0013	0.0104	0.0013	0.3120	0.0018
R34	Castlecoo Hill pNHA	714398	782980	0.1327	0.0025	0.0027	0.0011	0.0011	0.0088	0.0011	0.2121	0.0015
R35	Clogher Head pNHA	717241	784096	0.0641	0.0015	0.0016	0.0007	0.0007	0.0050	0.0007	0.1448	0.0009
R36	Barmeath Woods pNHA	708876	788046	0.0966	0.0013	0.0013	0.0006	0.0006	0.0040	0.0006	0.3808	0.0008
Max predicted conc. value at human receptor beyond the facility boundary (ug/m3)	-	-	-	20.2737	1.3148	2.1568	0.6641	0.6641	8.4668	0.6641	31.1796	0.9317
Max predicted conc. value at Habitats receptor beyond the facility boundary (ug/m3)	-	-	-	0.6207	0.0094	0.0116	0.0035	0.0035	0.0374	0.0035	0.4509	0.0048
Traffic contribution	-	-	-	0.6	0.3	0.06	0.03	0.03				
Average Baseline conc. (ug/m3)	-	-	-	19.14	9.57	15.9	15.9	9.1	1.25	0.625	3.2	1.6
Combined baseline, traffic and worst case receptor conc. (ug/m3)	-	-	-	40.0137	11.1848	18.1168	16.5941	9.7941	9.7168	1.2891	34.3796	2.5317
Combined baseline and worst case habitats conc. (ug/m3)	-	-	-	19.7607	9.5794	15.9116	15.9035	9.1035	1.2874	0.6285	3.6509	1.6048
Environmental Assessment Level Human health (ug/m3)	-	-	-	200	40	50	40	25	100	20	2,500	180
Environmental Assessment Level Ecological impact (ug/m3)	-	-	-	-	30	-	-	-	-	-	-	3 (1)
% of impact criterion (human impact)	-	-	-	20.01	27.96	36.23	41.49	39.18	9.72	6.45	1.38	1.41
% of impact criterion (Habitats impact) (no account taken of N/S deposition, acidification)	-	-	-	-	31.93	-	-	-	-	-	-	53.5 (160.5)
% Magnitude of change of Process contribution relative to Annual mean – see Table 11.6	-	-	-	-	**3.3**	**-**	**1.7**	**2.7**	**-**	**3.3**	**1.2**	**0.5**

Ground level concentrations of air pollutants were predicted at each of the named sensitive receptors (residential, commercial and designated sites) contained in Table 11-2 and presented on Figure 11.2 in Appendix 15. As can be observed, the cumulative predicted GLC of each pollutant for the protection of human health is well within their respective ground level concentration limit (range of less than 0.87% to 41.49% of impact criterion as per Table 11-12 when the proposed plant is at 100% operation capacity. Table 11-12 provides an analysis of the predicted data in terms of % of relative impact criterion for each pollutant and for both receptors and habitats (as limit values are different for both categories (human health versus habitats)). Figures 11.4 to 11.12 present illustrative contour plots for each pollutant (Appendix 15).

<u>National Emissions Ceiling</u>

A comparison of the proposed Facility's operations with the obligations under the National Emissions Ceiling Directive indicates the effect of the development is to increase NO_X levels by 0.0077% and Ammonia levels by 0.0095% of the ceiling levels based on 2020 reported totals (EPA, 2022).

<u>Climate</u>

Electrical and Gas usage would be expected to be the dominant sources of greenhouse gas emissions as a result of the operation of the proposed development. Gas and Electrical used to operate the plant will give rise to CO_2 and N_2O emissions as a result of the proposed development.

During full production, it is projected that the facility will used 810 MW of electricity and 1,366.56 tonnes of LPG and 10,000 L of diesel for the operation of the facility. Electrical supply will be made up of 65.3% green renewable supply. This is equivalent to 4,173.90 tonnes of CO_2 eq. which is equivalent to 0.00678% of the Irelands Final Greenhouse Gas Emissions 1990-2017 (April 2019).

With reference to relevant evaluation criteria stated within this document, which has set objectives to be achieved, GHG emissions as a result of this proposal will be **Imperceptible**.

11.5.4 Unplanned events (Accidents or Major Disasters)

Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports indicates that EIARs should address unplanned effects as relevant (examples include accidents, spills, floods and fires). Directive 2014/52/EU further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned. The Directive gives examples of 'flooding, sea level rise, or earthquakes'.

With regards to unplanned events (Accidental / Major disasters) such as a fire, the risk would be considered low. The impacts to Air Quality would be considered **Negligible**.

11.5.5 Cumulative impacts

With regards to cumulative impacts, the baseline air quality analysis carried out as part of the assessment identified that all levels of classical air pollutants were less than the allowable guideline and statutory limit values. This baseline assessment has considered the existing environment while the air quality impact assessment has considered the proposed facility. Given that all baseline and all proposed facility air quality pollutants were below statutory and guideline limit values for such pollutants, cumulative impact can be considered compliant with the regulatory limit value.

Effects arising in respect of existing developments are considered within the assessment of the receiving environment, and as such are considered cumulatively with the effects of the proposed development as set out in this Chapter.

In accordance with EIA legislation and Table 3.5 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (see Section 1.9 of Chapter 1), a search was undertaken for approved developments, but not yet built or operational, of relevance to the consideration of cumulative effects in respect of Air Quality & Climate and none were identified.

11.5.6 "Worst Case" Scenario

A worst case of assessment was utilised throughout the air quality impact study in order to assess any risk associated with the proposed operation of the plant.

Worst case volume flow and pollutant concentration limits were analysed within the impact assessment. It was assumed that the operational facility will operate 24 hrs per day, 7 days per week, 365 days per year. In addition, all data analysis was performed utilising the worst case meteorological year. Given these facts, it is considered that the worst case scenario is analysed as part of the assessment.

Emission limit volume flow and concentration values for all pollutants where applicable will be regulated through the Planning process and/or by the Environmental Protection Agency (i.e. Environmental regulator through IED licencing process.

11.5.7 Table of Impacts

Table 11-13 Table of Impacts

Scenarios where Impacts may arise	Potential Impact				Quality of Effect	Significance of Effect	Extent/Context of Effect	Probability	Duration
	Activity	Attribute/receiving environment	Importance of attribute/sensitivity of receiving environment	Nature of Effect (description)					
Construction phase	Construction of proposed development (construction traffic, excavation, track out)	Number of Residential dwellings within 0.5km	Medium Sensitivity	Direct: Air emissions arising from construction traffic, excavation and track out	Negative	Imperceptible	Number of Residential dwellings within 0.5km	Likely	Temporary
	Dust	Number of Residential dwellings within 0.5km	Medium Sensitivity	Direct: Dust emissions as a result of Site preparation, Excavation, Demolition, Construction, Track out, Off site transportation	Negative	Imperceptible	Number of Residential dwellings within 0.5km	Likely	Temporary
Operational phase	Traffic	Number of Residential dwellings within 0.5km	Low Sensitivity	Direct: Air emissions and dust as a result of traffic	Negative	Imperceptible	Number of Residential dwellings within 0.5km	Likely	Continuous
	Climate	Number of Residential dwellings within 0.5km	Medium Sensitivity	Direct: Greenhouse gasses as a result of operations	Negative	Imperceptible	Number of Residential dwellings within 0.5km		Continuous
	Multiple pollutants from process	Number of Residential dwellings within 0.5km and Natura receptors up to 15 km from site	Medium sensitivity	Direct: Emission of various pollutants from process operations	Negative	Low	Number of Residential dwellings within 0.5km and Natura receptors up to 15 km from site	Likely	Continuous
Unplanned Events	Fire / Explosion / Dust blow	Residential dwellings within 0.5km	Medium	Direct/Indirect	Negative	Moderate effects	Within 0.5km of the site, low number of receptors	Unlikely	Temporary

11.6 Remedial and Mitigation measures

11.6.1 Construction phase

The objective of dust control at site is to ensure that no significant nuisance occurs at nearby sensitive receptors. The construction phase is limited and short in duration;

In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK (IAQM (2014), The Scottish Office (1996), UK Office of Deputy Prime Minster (2002) and BRE (2003)) and the USA (USEPA (1997)).

A full traffic management plan and dust management plan will be incorporated into a Construction Environmental Management Plan (CEMP) in order to minimise such emissions as a result of the construction phase of the development. This will be generated specifically for the proposed development when detailed design is completed.

Site management

The aim is to ensure good site management by avoiding dust becoming airborne at sources. This will be done through good design and effective control strategies. A Dust Management Plan (DMP) should be prepared and agreed with the stakeholders for implementation on-site. A DMP is a documented site-specific operational plan to prevent or minimise the release of dust from the site. It should describe the management and operational actions the site will use to deal with both anticipated (e.g. forecast) and actual high risk conditions (e.g. dry days with measured winds above moderate breeze). The DMP should describe the conditions under which dust is most likely to pose a risk of disamenity at sensitive receptors close to the site and set trigger levels which, when exceeded, would require further dust control measures to be implemented (i.e. over and above the routine measures)

At the construction planning stage, the siting of activities and storage of materials will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 11-1 for the wind rose for Dublin Airport met station). As the prevailing wind is predominately south westerly, locating materials downwind (to the north east) of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.20 mm/day, dust generation is generally suppressed (UK Office of Deputy Prime Minister (2002), BRE (2003)). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 Knots) (at 7m above ground) to release loose material from storage materials and other exposed surfaces (USEPA, 1987). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods where care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The operator must monitor performance to ensure that the proposed mitigation measures are implemented and that dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- All dust control conditions contained within this chapter shall be achieved.
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practices and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Site Roads and Routes

Movement of transportation trucks and plant trucks along haul roads (in particular unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of supressing dust emissions from unpaved roads to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK Office of Deputy Prime Minister, 2002).

- Bowsers or suitable watering equipment will be available during periods of dry weather through the construction period. Research has found that watering can reduce dust emissions by 50% (USEPA, 1997). Watering shall be conducted during sustained periods to ensure that unpaved areas are kept moist. The required application rate frequency will vary according to soil type, weather conditions and vehicular use;
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface.

Site traffic on Public roads

Spillage and blow off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed, covered or wetted at all times to restrict the escape of dust;
- Public roads directly outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

Summary of Dust Mitigation Measures

The proactive control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the operator.

A full traffic management plan and dust management plan will be incorporated into an Environmental Management System in order to minimise such emissions as a result of the construction and operational phase of the development. This will be generated specifically for the proposed development when detailed design is completed.

In order to ensure that no dust nuisance occurs at sensitive receptors, a series of measures will be implemented through the CEMP:

- On site roads shall be regularly cleaned and maintained as appropriate.
- Hard surface roads shall be swept to remove mud and aggregate materials from their surface as a result of the development.
- Any un-surfaced roads shall be restricted to essential site traffic only.

- Furthermore, any on site road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during extended dry and/or windy conditions.
- Vehicles using site roads shall have their speed restricted, and this speed restriction will be enforced rigidly. On any un-surfaced site road and on hard surfaced roads speed shall be restricted to 20 km per hour within the site.
- Vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust.
- Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.
- At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the subject site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.
- In relation to the completion of the proposed development, the hard standing surface, and all roads will be gravelled, tarmacadamed/concreted where applicable. In periods of dry weather when dust emission would be greatest, a road sweeper, which would also dampen the road will be used on hard standing surfaces.
- In terms of good practice construction vehicles and equipment will receive regular maintenance. Technical inspection will be performed of vehicles to ensure they will perform most efficiently. A Traffic Management Plan will be implemented to minimise congestion.

11.6.2 Operational Phase

Scheduled emission points

Scheduled emission points operated within the facility will be regulated through the EPA Licencing process and emission limit values utilised in this assessment are typical of emission limit levels used for this specific process.

This assessment demonstrates that emission levels as a result of the operation of the proposed plant will not result in air quality impact above the stated Irish and European assessment criteria limits and guidelines. The air pollutant emissions from each of the four stacks will exhaust through 20m stacks for emission points E2, E3, E4 and E5.

11.6.3 Table of Mitigation

Table 11-14 Table of Mitigation Measures

Scenarios where Impacts may arise	Potential Impact			Mitigation measure	Residual effect (following mitigation)	
	Activity	Attribute/receiving environment	Nature of Effect (description)	Description	Significance or quality of Effect	Probability
Construction phase	Construction of proposed development	Residential dwellings within 0.5km	Dust arising from construction traffic, excavation and earth moving	Construction traffic will be restricted to 8am to 6pm Mon to Friday and 8am to 2pm on Saurdays and exclude Sundays. Construction works will be carried out in accordance with guidance set out in Section 11.6.1	Neutral	Unlikely
	Site management	Residential dwellings within 0.5km	Poor site management will lead to increased emissions and poor control	The operator must monitor performance to ensure that the proposed mitigation measures are implemented and that dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions; A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out; All dust control conditions contained within Section 11.6.1 shall be achieved. At all times, the procedures put in place will be strictly monitored and assessed. See Section 11.6.1	Neutral	Unlikely
Operational phase						
	Site roads and routes	Residential dwellings within 0.5km	Dust arising from site roads and route location	Speed restrictions to 20 km/hr. Minimise unpaved sections and located away from sensitive receptors. Bowsers wetting to minimise dust formation during dry conditions See Section 11.6.1	Neutral	Unlikely
	Site traffic on public road	Residential dwellings within 0.5km	Dust from transport vehicles and dirty roads	Controlled via covering, wetted or enclosed load transport Road sweeper to clean roads, Wheel wash to minimise tracking on to roads See Section 11.6.1	Neutral	Unlikely
	Operation vehicles	Residential dwellings within 0.5km	Air emissions as a result of poorly maintained site vehicles	Service and maintain site vehicles regularly to minimise air emissions associated with the equipment.	Neutral	Unlikely
	Scheduled emission points	Residential dwellings within 0.5km	Air emissions as a result air pollution control plant failure	Service and maintain regularly to minimise air emissions associated with the equipment. Performed regular air monitoring of performance of air pollution control plant in accordance with IED licence.	Negative	Unlikely
Unplanned Events	None	Residential dwellings within 0.5km	None	None	None	None

11.7 Residual impacts

11.7.1 Construction Phase

There will be no residual impacts on air quality or climate as a result of the limited construction phase.

11.7.2 Operational Phase

Air Quality

When dust mitigation measures detailed in the mitigation section of this report are implemented, fugitive emissions of dust and particulate matter from the site will be **minor** and **not significant** in nature posing no nuisance at nearby receptors.

The facility will operate four main emissions points from their production process. These will be licenced to operate by the EPA under an IED licencing process. This will stipulate specific emission limit values for pollutants from these processes. The licensee will be required to be compliant with these emission limit values. This will ensure that the facility will operate well in compliance with statutory air quality limit values. When compared against the statutory air quality limit values, the operational facility will remain well within these air quality limit value with typical worst case impact been 0.87% to 40.91% of the impact criteria.

Climate

Based on the scale and nature of construction / operation works and the use of equipment, the potential impact on climate change and transboundary pollution from the Proposed Development is deemed to be **Permanent** and **not significant** in relation to Ireland's obligations under the EU 2020 targets.

Human Health

Best practice mitigation measures are proposed for the operational phase of the Proposed Development which will focus on the pro-active control of dust and air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during the operation of the Proposed Development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction and operation of the Proposed Development is likely to be **imperceptible** with respect to human health.

11.8 Interactions with other impacts

Interactions with human health and population are likely to arise during the construction and operation phase, however the mitigation measures that will be put in place during the construction and operation phase of the Proposed Development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction and operation of the Proposed Development is likely to be **imperceptible** with respect to human health. This is further discussed within Chapter 4 - Human and Population Health.

11.9 Monitoring measures

With respect to monitoring measures temporary dust deposition monitoring will be carried out at the facility during construction phase of the project in order to ensure the boundary levels of deposition and nuisance dust are within recommended limit which are typically less than 350 mg/m^2/day.

With regards to the operation phase of the project, the facility will be required to monitor specific pollutants as detailed within their EPA IED licence. The EPA IED licence will specify emission limit values for each specific pollutant and compliance with these emission limit values will be required by the regulator. The limit values expected to be applied to each of emission points E2, E3, E4 and E5 are stipulated in Table 11.11 of this chapter.

11.10 Bibliography

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12 LANDSCAPE & VISUAL IMPACT

12.1 Introduction

This report has been prepared by Mullin Design Associates, Chartered Landscape Architects, to establish potential landscape and visual impacts/effects arising from a proposed hot dip galvanising facility at Mell, Drogheda, Co. Louth. (See Figure 1.1 Location & Context in Appendix 16).

The current site layout is provided in the Existing Site Layout Drawing (Ref. C216-DR-BCON-CE-002) and the proposed layout is provided in Proposed Site Layout (C216-DR-BCON-CE-003).

- Construction of a main building with an approximate gross floor area of 5719m^2. The building contains
  - (i) 'black material' (unprocessed material) jigging area (in-take area)
  - (ii) Pre-treatment area
  - (iii) Galvanising (treatment) area
  - (iv) Galvanised material unjigging area (out-take area)
  - (v) Services area
  - (vi) Staff welfare facilities (2 storey over basement)
- Construction of 2 No. stacks to extract flue gases from the main and stand-by furnaces respectively. These will be located on the roof at a height of 20 m above finished floor level.
- Construction of 1 No. stack to extract white fumes from the zinc kettle. Exhaust air will be filtered through bag filters. filtered air from the bag filters will then be exhausted to air at 20 m above finished floor level.
- Construction of 1. No. stack to extract exhaust air from the pre-treatment area. Acid vapours produced in the pre-treatment area are passed through a scrubber prior to discharge to air. This stack will be located at 20 m above finished floor level.
- Construction of ESB sub-station within the main building.
- Installation of 2 no. LPG storage tanks.
- Installation of double weighbridge.
- Construction of office building (2 storeys) with an approximate gross floor area of 298m^2.
- Provision of trailer and truck parking spaces.
- Provision of 110 no. visitor and staff parking areas, 2 of which are wheelchair accessible and 7 of which are EV charging locations.
- Provision of 20 no. staff and visitor bicycle parking.

- Provision of concrete yard and additional hardcore yard.
- Installation of stormwater management system.
- Installation of 2 No. rainwater harvesting tanks
- Construction of soil berm.
- Landscaping works
- Firewater retention infrastructure
- Provision of vehicular and pedestrian entrance to the facility, site security fencing and entrance walls and gates.

The main building has a gross floor area of 5719m^2 and is divided into three main sections

- In-take/out-take section at the southern end of the building. This is single storey and has a maximum height above finished ground level of 14.55m.
- Processing & services area at the northern end of the building. This is also single storey with maximum height above finished ground level of 17.30m. The processing area is the area where the steel is pre-treated and galvanised. The services area is where the chemicals are stored, mixed and distributed from. It also contains air abatement infrastructure (acid vapour scrubber & white fumes bag filters) and control panels.
- Welfare facilities, located at northeastern corner.
- In addition, there are 4No x stacks on the roof of the northern section of the main building at 20m above finished floor level.

Two existing residential properties adjoin the western boundary, however along this boundary a substantial soil berm combined with impermeable fence will assist with mitigation of potential noise and visual impacts. Native woodland planting will be introduced around the entire site to further improve screening and integration of the development into this location. Screen planting will be predominantly native, include 25% evergreen including Scotspine and Holly – Refer to submitted Landscape Planting Plan 'MDA Dwg.23.10.100'

The Landscape and Visual Assessment has been prepared by Pete Mullin, BA (Hons) CMLI, MILI Chartered Landscape Architect and principal of Mullin Design Associates. Pete has produced several hundred Landscape and Visual Impact Assessments during over 25 years in the profession.

There were no limitation encountered or assumptions made during the compilation of this assessment.

12.2 Methodology

12.2.1 Method of Assessment & Guidelines

The assessment of potential landscape and visual impacts for this development are based on the most up to date guidelines provided by The Landscape Institute, 'Guidelines for Landscape and Visual Impact Assessment', (3rd Edition) 2013; 'The Countryside Agency and Scottish Natural Heritage – Landscape Character Assessment Guidance for England and Scotland' 2002; and 'An Approach to Landscape Character Assessment' Natural England Oct 2014.

This assessment has been prepared in accordance with Environmental Protection Agency (EPA) "Guidelines on the Information to be contained in Environmental Impact Assessments" May 2022.

In light of the extensive archaeology and cultural heritage in the region, the preparation of the LVIA will be conducted in close consultation with the project Archaeologist undertaking the Heritage Impact Assessment. Also, in this regard reference will also be made to the 'Guidance on Heritage Impact Assessments for Cultural World Heritage Properties' prepared by the International Council on Monuments and Sites (IMOCOS) 2011

Reference has been made to Louth County Council Development Plan 2021-2027 and specifically 'Louth County Landscape Character Assessment' originally completed in 2002.
In addition, given the proximity of the proposed development to the county boundary, Meath County Development Plan 2021-2027 (in particular its County Landscape Character Assessment) has been consulted.

Finally, as recommended by the Guidance for Landscape and Visual Impact Assessment 3rd Edition, the landscape and visual assessment incorporates both desk and field-based studies, and has been compiled and interpreted by an experienced landscape professional.

12.2.2 Assessment Sequence

This landscape & visual Assessment was undertaken in the following stages:

- Desk Study (Stage 1)
  1. Analysis of Baseline data, maps and plans;
  2. Consultation of Policy Documentation;
  3. Zone of Visual Influence (Theoretical);

4 Identification of Potential Visual Receptors;

- Field Study
  5 Confirmation of Visual Receptors;
  6 Photo Survey from Visual Receptors;
  7 Zone of Visual Influence (Actual/Field);
  8 Confirmation of Landscape Character;
  9 Establish Landscape Sensitivity;

- Desk Study (Stage 2)
  10 Analysis of Field Survey data;
  11 Viewpoint Analysis;
  12 Consider Mitigation and,

- Desk Study (Stage 3)
  13 Report Preparation.

12.2.3 Assessment Criteria

In accordance with guidance the aim of this landscape and visual impact assessment is to identify, evaluate and predict potential key effects arising from the proposed development. The assessment combines sensitivity with predicted magnitude of change, to establish the significance of residual landscape and visual effects. These are based on pre-defined criteria as set out in Tables 12.1 to 12.5 below.

Table 12-1 Landscape Sensitivity Criteria

Class	Criteria
High	Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character. Landscape designated for its international or national landscape value. Outstanding example in the area of well cared for landscape or set of features.
High-Medium	Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character. Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent. Good example in the area of reasonably well cared for landscape with notable landscape features.
Medium	Landscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character. Landscape designated for its local landscape value or a regional designated landscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated landscape which may be valued locally – for example an important open space. An example of a landscape or a set of features which is neutral or mixed character.
Medium-Low	Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character.

	No landscape designation present or of medium to low local value, or an example of a common or un-stimulating landscape or set of features and conditions.
Low	Landscape characteristics or features which are tolerant of change without detriment to their present character. No designation present or of low local value. An example of monotonous unattractive visually conflicting or degraded landscape or set of features.

Table 12-2 Visual Sensitivity Criteria

Class	Criteria
High	Users of outdoor recreational facilities, on recognised national cycling or walking routes or in national designated landscapes. Dwellings with views orientated towards the proposed development.
High-Medium	Users of outdoor recreational facilities, in locally designated landscapes or on local recreational routes that are well publicised in guide books. Road and rail users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view.
Medium	Users of primary transport road network, orientated towards the Development, likely to be travelling for other purposes than just the view. Dwellings with oblique views of the proposed development.
Medium-Low	People engaged in active outdoor sports or recreation and less likely to focus on the view. Primary transport road network and rail users likely to be travelling to work with oblique views of the Development or users of minor road network.
Low	People engaged in work activities indoors, with limited opportunity for views of the Development. Road users on minor access roads travelling for other purposes than just the view.

Table 12-3 Landscape Magnitude Criteria

Class	Criteria
Very High	Very extensive, highly noticeable change, affecting most key characteristics and dominating the experience of the landscape; and, Introduction of highly incongruous development.
High	Extensive, noticeable change, affecting many key characteristics and the experience of the landscape; and, Introduction of many incongruous elements.
Medium	Noticeable change to a significant proportion of the landscape, affecting some key characteristics and the experience of the landscape; and Introduction of some uncharacteristic elements.
Low	Minor change, affecting some characteristics and the experience of the landscape to an extent; and, Introduction of elements that are not uncharacteristic.
Very Low	Little perceptible change.

Table 12-4 Visual Magnitude Criteria

Class	Criteria

Very High	The proposed development would dominate the existing view.
High	The development would cause a profound change to the existing view over a wide area or a considerable change over a limited area.
Medium	The development would cause moderate change to the existing view over a wide area or a noticeable change over a limited area.
Low	The development would cause minor changes to the existing view over a wide area or moderate changes over a limited area.
Very Low	No real change to perception of the view. Weak, not legible, and/ or indiscernible.

Table 12-5 Categories of Landscape and Visual Significance of Effect

Degree of significance	Description of Landscape Effect	Description of Visual Effect
Major	Substantial alteration to elements/features of the baseline (pre-development) conditions. Notably affect an area of recognised national landscape quality. Substantial alteration to the character, scale or pattern of the landscape.	Major/substantial alteration to elements/features of the baseline (pre-development) conditions. Where the proposed development would cause a very noticeable alteration in the existing view. This would typically occur where the proposed development closes an existing view of a landscape of regional or national importance and the proposed development would dominate the future view.
Moderate-Major	This category is a combination of descriptions of Major listed above and Moderate below. These combinations are discussed within the assessment of each landscape or visual receptor when they occur.	
Moderate	Alteration to elements/features of the baseline conditions. Affects an area of recognised regional landscape quality. Alteration to the character, scale or pattern of the local landscape.	Alteration to one or more elements/features of the baseline conditions such that post development character/attributes of the baseline will be materially changed. This would typically occur where the proposed development closes an existing view of a local landscape and the proposed development would be prominent in the future view.
Moderate-Minor	This category is a combination of descriptions of Moderate listed above and Minor below. These combinations are discussed within the assessment of each landscape or visual receptor when they occur.	
Minor	A minor shift away from baseline conditions. The Development partially changes the character of the site without compromising the overall existing landscape character area.	A minor shift away from baseline conditions. This occurs where change arising from the alteration would be discernible but the underlying character / composition / attributes of the baseline condition will be similar to the pre-development. It would also occur where the proposed development newly appears in the view but not as a point of principal

		focus or where the proposed development is closely located to the viewpoint but seen at an acute angle and at the extremity of the overall view.
Negligible	No or very little change from baseline conditions. Change not material, barely distinguishable or indistinguishable.	Where there is no discernible improvement or deterioration in the existing Landscape Character Area or the view.
No Effect	The Development would not affect the landscape receptor.	The Development would not affect the view.

The significance of identified landscape and visual effects is established through a simple matrix, which measures the magnitude of change against landscape or visual sensitivity. The resulting impacts are classed Major, Moderate-Major, Moderate, Minor, Negligible/None.

Therefore, as the sensitivity of a landscape increases from Low to High, and the Magnitude of Change increases from Very Low to Very High the predicted impacts also increase.

The example matrix table below is used to summarise the findings from the criteria tables. By combining sensitively (along the top) with predicted magnitude of change (along the side) a predicted impact/ effect is reached. This format is applicable to both landscape impacts and visual impacts.

Table 12-6 Matrix Example

Example Matrix (Professional judgement applied at every stage of assessment and matrix only used to check consistency.)		Sensitivity				
		High	**High / Medium**	**Medium**	**Medium - Low**	**Low**
Magnitude	**Very High**	Major	←→	Major	←→	Mod-major
	High	Major	←→	Mod-major	←→	Moderate
	Medium	Mod-major	←→	Moderate	←→	Minor
	Low	Moderate	←→	Minor	←→	Negligible
	Very Low	Minor	←→	Negligible	←→	Negligible / None

Intermediate sensitivity ratings (as per the criteria) would lead to a series of effects that lie between those stated above if a matrix was applied to the assessment. Professional judgement is then used to determine the degree of effect. e.g. high-medium sensitivity combined with medium magnitude would equate to a Moderate+ effect and a decision needs to be made to determine if this effect is Moderate or Moderate-Major. Intermediate magnitude ratings can also be arrived at during the assessment and a similar method is also applied here.

Effects above Moderate are considered Significant (presented in dark grey in the example matrix).

Where intermediate effects are arrived at, particular care should be taken at the upper and lower limits of the significance threshold i.e. between Moderate and Moderate-Major (presented in lighter grey in the example matrix).These effects may require additional explanation as to why the decision was made to judge the effect as either significant or not significant.

In addition to the impacts which sensitivity combined with the magnitude of change generate, there are a number of other factors which are taken into account when preparing the landscape and visual assessment.

Development is often viewed as permanent and/or perceived to have a negative impact, it is therefore important to emphasise that change created by development can result in beneficial outcomes, and may also be temporary, short-term or indeed reversible.

This assessment also considers and identifies both the 'Type' and 'Duration' of the potential impacts. The following terminology has been used where appropriate.

Type of Visual Impacts

- **Beneficial (B)**: A positive impact which will improve or enhance the landscape character or viewpoint.
- **Neutral (N):** A neutral impact which will neither enhance nor detract from the landscape character or viewpoint.
- **Adverse (A)** : A negative impact which will have an adverse effect on the existing landscape character or viewpoint.

Describing the Duration and Frequency of Effects

- **Momentary Effects:** Effects lasting from seconds to minutes.
- **Brief Effects:** Effects lasting less than a day.
- **Temporary Effects:** Effects lasting less than a year.
- **Short-term Effects:** Effects lasting one to seven years.
- **Medium-term Effects:** Effects lasting seven to fifteen years.

- **Long-term Effects:** Effects lasting fifteen to sixty years.
- **Permanent Effects:** Effects lasting over sixty years.
- **Reversible Effects:** Effects that can be undone, for example through remediation or restoration.

12.3 Characteristics of the development

The current site layout is provided in the Existing Site Layout Drawing (Ref. C216-DR-BCON-CE-002) and the proposed layout is provided in Proposed Site Layout (C216-DR-BCON-CE-003).

The main building has a gross floor area of 5719m^2 and is divided into three main sections

- In-take/out-take section at the southern end of the building. This is single storey and has a maximum height above finished ground level of 14.55m.
- Processing & services area at the northern end of the building. This is also single storey with maximum height above finished ground level of 17.30m. The processing area is the area where the steel is pre-treated and galvanised. The services area is where the chemicals are stored, mixed and distributed from. It also contains air abatement infrastructure (acid vapour scrubber & white fumes bag filters) and control panels.
- Welfare facilities, located at northeastern corner.

In addition, there are 4No x 20m stacks.

12.4 Receiving environment

The Landscape is about the relationship between people and place. Understanding the character of a landscape allows us to identify its 'sense of place', and what distinguishes it from other places. All landscape has economic, social and environmental value; landscape characterisation provides a mechanism and baseline from which landscapes can be valued and their sensitivity and capacity to accommodate various development typologies gauged. Collectively this information assists with positive decision making when considering future appearance and function. This section establishes the landscape and visual context (or baseline) of the proposed development.

12.4.1 Desk Study

Desk studies generally involve analysis and interpretation of available print material relating to a site's context and the proposed development within that context. It is a way of focusing the study prior to detailed field work and landscape investigation. In this instance, variable scale Ordnance Survey maps and satellite imagery were studied along with 3D Data Terrain Models along with Landscape Character Assessments.

Although general in nature the desk study stage of the project assists in the clarification of the following considerations;

- **The general topography, vegetative cover, visible water, and sites of potential historic or cultural interest. – Refer to Figure 1.1 in Appendix 16**

  Study of the available map information indicates that the site is located in a peri-urban area on the Northwestern periphery of Drogheda. The general topography of the region can be described as coastal plain. The site itself has a Southerly aspect with the lowest point being C.36mAOD at the southern end of the site, rising to a highpoint of C.48mAOD to the North. In terms of significant woodland cover, the majority is focused along the Boyne River, with clusters also associated with estate landscapes such as Townley Hall and Killineer House. The coastline is approx. 9km to the east, with obvious visible waterbodies being the River Boyne 1.8km to the South and manmade waterbodies within former quarry sites to the South. In terms of potential historic or cultural interest, this general region is one of the most significant in the country, being within 3.5km of the Core protection area associated with Brú na Bóinne World Heritage Site and within 2km of its buffer zone. In addition the site and the surrounding area is intrinsically link to the Battle of the Boyne, with the subject site located 3km from the Battle of the Boyne visitors centre.

- **Identification of primary investigation area or Zone of Theoretical Visual Influence (ZTVI). Refer to Figure 1.3 in Appendix 16**

  The ZTVI is determined using topographical data only and does not account for the influence of intervening vegetation, fences, buildings, localised topographic variation etc. It is therefore generally accepted that refinement is required through field survey and analysis. The ZTVI has been generated based on the highest proposed structure on the site which will be the 20m High stacks. The model illustrates that there is a general spread of visual influence in an east west direction broadly following the topography of the Boyne Valley.

- **The potential relationship between the development and any residential settlements, dwellings and the surrounding transportation network.**

  The subject site is on lands zoned for General Employment to the Northwestern periphery of Drogheda adjacent to the R132. The site is located at the location of a previously proposed (but never completed) business park, and in proximity to some part built infrastructure relating to this. The same lands are now anticipated to be developed as an IDA business park. There is a small number of individual residential properties within close proximity of the site with significant areas of new housing forming the current urban edge of Drogheda 1.2km to the Southeast.

- **Landscape & Visual Designations, Protected areas and significant viewpoints.**

  The site is not with any nationally significant landscape designation (National Park/ AONB etc) however it is within 1km of an area of High Scenic Quality as designated with the Louth Development Plan 2021-2027.

  The Core Protection Area of Brú na Bóinne UNESCO World Heritage site is C. 3.5km to the Southwest, with Buffer Zone 2km to the Southwest.

  There are a number of designated views and prospects within the region as identified within both the Meath & Louth Development Plans. Of these only one within the 5km range is orientated in the direction of the site (Namely View No 61 - Donore Graveyard)- Refer to Figure 1.2 in Appendix 16.

12.4.2 Field Study

Desk studies are important to establish the basic approach to landscape and visual assessment, and setting out principle issues/ areas to be investigated. However, it is only through field work that an accurate understanding of potential influence of a proposed development can be fully determined.

Most importantly field study helps to clarify the eye level visual envelope of the development. This exercise refines the computer generated ZTVI models to more accurately reflect the actual visual envelope of the development.

The area was visited and surveyed during in Autumn with foliage cover beginning to diminish, and in Winter with vegetation at its lightest.

The influence of foliage cover and its seasonal variability has been factored into the findings, with a worst case scenario considered – i.e. vegetation cover at its lightest.

In addition to the information revealed during the desktop analysis, the field study work investigates and considers a number of critical issues, which have been factored into the assessment conclusions:

- Confirmation of the landscape character associated with the study area, sense of place, quality and value of the surrounding landscape as described in the published County Development Plans;
- Localised topography variation and woodland / hedgerow cover;
- Effects of localised planting, walls, earthworks;
- Relationship with sites of Cultural heritage;

- Relationship of other development throughout the area and particular how the development would integrate with the existing settlement pattern;
- Potential eye level perceptions (local residents – frequent, passive tourism – occasional); and,
- General landscape dynamic (assessing the potential pressures and evolution of the surrounding landscape).

12.4.3 Baseline Study – Site description

The subject site is currently composed of zoned lands which have been cleared in the past , but having been undeveloped for several years have experienced a degree of natural regeneration with self-seeded pioneer establishment.

The site occupies an area of c.3.3Ha and generally rectangular in plan form, running parallel with the R132 to the east. The site and surrounding lands are zoned E1 General Employment. There are a small number of existing residential properties in the vicinity. This includes two properties located adjacent to the sites western boundary.

Lands to the North of the site are currently unused, whilst lands to the west, south and east are currently in agricultural use. The site is not currently located within a 'business park' - it is located at the location of a previously proposed (but never completed) business park, and in proximity to some part built infrastructure relating to this. However. the same lands are now anticipated to be developed as an IDA business park.

12.4.4 Baseline Study - Landscape Character

The Landscape is about the relationship between people and place. Understanding the character of a landscape allows us to identify its 'sense of place', and what distinguishes it from other places. All landscape has economic, social and environmental value; landscape characterisation provides a mechanism and baseline from which landscapes can be valued and their sensitivity and capacity to accommodate various development typologies gauged.

An accurate description of the landscape character areas associated with the subject site was originally prepared by Louth County Council in 2002 and whilst this is somewhat dated, it provides a workable landscape baseline.

As set out within this document the subject site is located centrally within the Landscape Character Area (LCA) classified as 'Boyne & Mattock Valley'.

The key characteristics of this LCA are described as follows:

- *Land tends to slope southward presenting panoramic views of Drogheda, the Coast and the plains of Meath;*
- *Noted for its archaeological, historical and landscape values;*
- *New motorway Boyne Bridge has already become a dominant landscape icon. New interchanges will attract new commercial and industrial development;*
- *Drogheda town is recognised as being within the commuter belt for the greater Dublin region where in-migration is expected to increase at an even greater pace than in the past ;*
- *Hinterlands of Drogheda are subject to pressures for further isolated housing development, mainly generated from within the town itself;*
- *The area is quite extensively covered with broadleaf trees and fine hedgerows;*
- *Popular Tourist destination particularly for bus tours from Dublin and beyond; and,*
- *Disused quarries tend to degrade the landscape qualities.*

Landscape Values & Classification

Key Value	***Objective***
Panoramic views across the town of Drogheda into the plains of Meath.	*Conserve*
Landscape quality has largely remained intact, in terms of field patterns, hedgerows and stone walls.	*Conserve / Enhance*
Rich in archaeological features which include old Mellifont along with St Lawrences Gate	*Conserve*

Scenic quality is enriched by the groups of mature broadleaf trees.	*Conserve / Restore*
Steeped in important religious and military historical events.	*Conserve / Enhance / Restore*
Potential for recreational opportunities (particularly water based)	*Conserve/ Enhance*
Listed Scenic routes to the west of Drogheda	*Conserve / Enhance*
Existing hedgerows and stone walls.	*Conserve*
This area borders onto Co. Meath who have identified their area as the Lower Boyne Valley. It is logical that there is clearly only one landscape area involved here despite the existence of the two administrative areas of Louth and Meath. *On this account Brú na Bóinne, World Heritage Site, would be considered as being located within this landscape area and should be accredited as such. Part of the Northern Buffer zone for this Heritage Site is located within Co. Louth.*	
Overall Classification	*International*

The Landscape Character Assessment as outlined above broadly describes and classifies the landscape of the county, providing a valuable tool to aid decision making by planners and other interested parties.

However, it is generally accepted that large scale characterisation of this type has limitations. Within each identified character area there can be localised variability of landscape conditions which cannot be identified at a large scale. For example it would not be unusual to find pockets of very high or very low landscape value within a landscape character area generally classified as having an overall landscape value of medium.

Although this point in not contained within the Louth Development Plan, the requirement for further refinement of each LCA is acknowledged within Chapter 8 of the Meath Development Plan which states that, 'it is only possible to define actual **capacity on a case by case basis** because it will vary according to the type and form of development, its location in relation to the landscape area in question, and its visibility from it'.

12.4.5 Baseline Study – Visual

When establishing the extent of a development proposal's visibility there are a number of recognised stages:

- The first is generally conducted through desk study via utilisation of digital terrain models or printed mapping to generate a ZTVI. This provides the assessor with a worst-case scenario of potential visibility, recognising that the exercise does not account for potential screening influence of vegetation, manmade structures or indeed low level localised topographical variation.

  1. With ZTVI prepared, the next stage is to consider potential visual receptors. Again, this can initially be carried out as a desk study to identify potential properties, road intersections, historic (cultural heritage) sites or OS marked viewpoints etc which may be important to the assessment.
  2. The next stage generally is to test and refine desk study analysis in the field. Consideration of the surrounding landscape from a high point within the proposed development site is often a logical starting point for field work. From an elevated location, the assessor (comparing with ZTVI mapping) can identify points in the wider landscape from which the site is most likely to be visible. This exercise is known as intervisibility and forms the basis of defining the actual visual envelope.
  3. The final stage is to consider visibility of the subject site from the surrounding landscape. This generally involves assessment and photography from fixed key locations as identified, along with sequential views experienced along pedestrian and vehicle routes.

Table 12-7 Visual Receptors

Description	Grid Reference	Address (near)	Receptor Type
VP 1a & 1b	O 06037 76536	Application site	Intervisibility
VP 2	O 07298 76975	R132	View North – Sequential
VP 3	O 06848 78039	R132 - at Killineer House	View South – Sequential
VP 4	O 06505 76685	N51 – Hill of Rath Roundabout	Sequential (Primary Road)
VP 5	O 07370 76879	Rosehall Roundabout	Sequential (Primary Road)

VP 6	O 08308 76932	New Residential Development, The Twenties,	Residential / Educational
VP 7	O 05726 79041	Killineer, St. Peter's,	Sequential (Local Road) , HSQA
VP 8	O 04118 75995	Oldbridge House, Oldbridge,	Heritage Brú na Bóinne Buffer Zone
VP 9	O 05564 74059	Donore Graveyard, Rathmullan,	Designated View - Brú na Bóinne Buffer Zone
VP 10	N 99711 73558	Knowth, N51, Monknewtown, Mellifont,	Heritage Brú na Bóinne Core Area

It would obviously be impossible (indeed unnecessary) to assess potential visibility from every possible angle or potential viewpoint. Therefore, the recognised practice is to identify a selection of viewpoints considered representative of a range of views and viewer types, including residences, transport routes, recreational routes, visitor attractions, main landscape character types and a variety of distances, aspects, elevations, extents, and sequential routes. These are known as 'key visual receptors' and provide a reliable sample of impressions across the study area. Based on field survey and analysis of ZTVI (Figure 1.3 in Appendix 16) the location of key visual receptors was identified for the study – these are listed above in Table 12-7 and illustrated on Figure 1.6 in Appendix 16.

It is important to underline that whilst there is a defined number of receptors assessed within the report - field work undertaken by the assessor involves visit to a wide study area with numerous routes and locations being considered in context.

It should be noted as a basic visual principal, any type of development in the landscape will become less perceptible with distance. This simply equates to a reduction of the significance of potential visual impacts as one moves further away. The following distance categories have been considered appropriate.

Viewpoint Distance 0-2km

It is generally accepted that a development located approximately 2km or less from a viewer would be close enough to allow identification of some detail. Any positions within this range with open uninterrupted views of a development would generally receive the greatest visual impacts.

Viewpoint Distance 2-5km

At this distance, visibility of a development site becomes more general, with viewers in open uninterrupted positions able to identify general form, colour/tone and textural contrast, but losing the more focused detail achievable from closer positions. Effects at this distance are generally less than those found between 0-2km.

Viewpoint Distance 5-15km+

Beyond 5km visual prominence quickly diminishes. Certain circumstances/light conditions etc. have potential to allow certain types of development and material finishes to be perceived. The development increasingly becomes part of the general background/distance views. Upwards of 15km distance and developments quickly become minor features within the landscape and considered imperceptible to the average human eye. The development in effect becomes part of the general background/distance views.

Figures 1.6 to 1.41 in Appendix 16 illustrate the key visual receptors identified, with visual assessment and photomontage sequence from each included.

12.5 Impacts of the development

12.5.1 Landscape Impacts

Landscape assessments attempt to measure the sensitivity of specific landscape resources and describe the significance of changes to that landscape occurring as a result of a proposed development. More importantly, they should also identify opportunities during the design process focused on minimising potential landscape and visual impacts (mitigation) through positive iterative design intervention. This can include exerting influence on the development layout and arrangement, determining sympathetic approaches to realising the development proposal, i.e. suggested phasing, massing, buffer planting etc.

Landscape and visual impacts are intrinsically linked; therefore, measures to reduce landscape impacts such the introduction of green infrastructure will generally assist with reduction of visual impacts and vice versa.

It is understood that development of this type results in permanent change and may fundamentally alter the appearance of a landscape. However, it should be clarified that, localised alteration of appearance does not necessarily equate to long-term or permanent negative impacts to the overall landscape character unit. It is therefore essential that a holistic view is taken with proposals of this nature, not only assessing potential impact during the construction phases, but critically how it will appear when fully implemented and the new planting / landscaping mature.

In this case the site is located within a landscape character area which is clearly influenced and indeed defined by the urban influence of Drogheda,– whilst this development will alter the localised character of the site itself, it is unlikely to significantly alter the wider landscape character area within which the development is located.

Table 12-8 Landscape Sensitivity Summary (within visual envelope)

Consideration Factor	Comment	Significance
Landscape designations	The application site is not located within a nationally designated landscape, however is approx 1km from a County level designation of 'High Scenic Quality Area' Refer to Figure 1.2 in Appendix 16.	The UNESCO Brú na Bóinne core protection area is approx. 3.5km to the Southwest of the site. Whilst the protective buffer zone for Brú na Bóinne is 2km to the South West
Landscape scale	Complex, small scale and intimate along the river corridor. Occasion open views from localised elevated locations.	Important locally
Landscape quality	The surrounding landscape and its quality are somewhat degraded with evident urban expansion influences from Drogheda notable, recent housing areas, ESB powerlines, pylons/poles, various warehouse structures, M1 motorway, Boyne Bridge visible from a wide area along with Irish Cement plant to the south.	The landscape, although overall of reasonable quality, cannot be considered to be pristine or unable to accommodate this type of development.
Landscape value	The site is within a broader landscape considered to be of Medium- Low landscape value.	The site is not a Louth Development Plan landscape designated area
Public ownership and popularity	The site and much of the surrounding area is under private ownership.	The site and the immediate surrounding area contain few public recreation resources.
Landscape capacity	The site is located in a landscape with mature hedgerows and clusters of woodland which increase the potential capacity to accommodate the proposal.	The screening potential of the topography and existing vegetation, raises the capacity of the area to accommodate development. Introduction of extensive woodland cover associated with the site will further improve capacity.

Assessment of potential landscape impacts have been divided into two stages:-

- Construction Phase
- Operational Phase

12.5.2 Landscape Impacts - Construction Phase

The criteria tables 12.1 – 12.5 within section 12.2.3 Assessment Criteria provide definitions of sensitivity and magnitude of change which in turn establish a mechanism to determine potential significance of landscape and visual effects/ impact.

Landscape Sensitivity Criteria –Construction Phase

Landscape sensitivity remains the same whether considering the construction phase, or the post-construction phase.

With reference to Table 12-1 'Landscape Sensitivity Criteria' it is considered that the definition of **Medium –Low** is most suited to the landscape associated with the subject site. The assessment will therefore be based on this landscape definition (definition extract below).

Medium- Low - Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character.

No landscape designation present or of medium to low local value, or an example of a common or un-stimulating landscape or set of features and conditions.

Landscape sensitivity is combined with the magnitude of change generated by a development to establish the overall impact / effect.

In addition to the definitions outlined within the criteria tables, magnitude of change can also be influenced by the following:

- Potential for mitigation
- Development typology, phasing and duration.
- Relationship with similar development type in the area.
- The population numbers directly impacted.

Landscape Magnitude Criteria – Construction Phase

The construction phase is often considered the most visually disruptive stage for developments as they transform from their current condition to a new condition. Site clearance, construction activity including heavy machinery, material transportation traffic , etc. all combine to increase the 'Magnitude of change'. It should be noted that this stage not only includes vegetation clearance, access establishment, site offices and compound establishment, and construction of the built elements, it also include creation of proposed screen earth berm and introduction of advanced landscape screening works.

Table 12-3 'Landscape Magnitude Criteria' during the construction phase is predicted to be within the '**Medium**' category as defined in Table 12-3(extract of definition below) :-

Medium *Noticeable change to a significant proportion of the landscape, affecting some key characteristics and the experience of the landscape; and Introduction of some uncharacteristic elements.*

Table 12-9 Assessment of landscape impacts (Construction Phase)

		Sensitivity				
		High	**High - Medium**	**Medium**	**Medium – Low**	**Low**
Magnitude	**Very High**	Major	←→	Major	←→	Mod-major
	High	Major	←→	Mod-major	←→	Moderate
	Medium	Mod-major	←→	**Moderate**	←→	Minor
	Low	Moderate	←→	Minor	←→	Negligible
	Very Low	Minor	←→	Negligible	←→	Negligible

Therefore with **Medium-Low** landscape sensitivity combined with **Medium** magnitude of change it is considered that the proposal development would generate a **Moderate** impact on the landscape character area during the Construction Phase of the development.

12.5.3 Landscape Impacts - Post Construction / Operational Phase

The criteria tables 12.1 – 12.5 within section 12.2.3 Assessment Criteria provide definitions of sensitivity and magnitude of change which in turn establish a mechanism to determine potential significance of landscape and visual effects/ impact.

Landscape Sensitivity Criteria – Post Construction /Operational Phase

Landscape sensitivity remains the same whether considering the construction or post construction phases.

Therefore as above with reference to Table 12-1'Landscape Sensitivity Criteria' it is considered that the sensitivity definition of **Medium-Low** is most suited to the landscape associated with the subject site.

<u>Medium- Low</u> - Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character.
No landscape designation present or of medium to low local value, or an example of a common or un-stimulating landscape or set of features and conditions.

Landscape sensitivity is combined with the magnitude of change generated by a development to establish the overall impact / effect.
In addition to the definitions outlined within the criteria tables, magnitude of change can also be influenced by the following:

- Potential for mitigation
- Development typology, its phasing and duration.
- Relationship with similar development type in the area.
- The population numbers directly impacted.

<u>Landscape Magnitude Criteria – Post Construction / Operational Phase</u>
The Post Construction phase essentially sees the development operational. By this stage all approved screening works would be implemented including berm , fencing and boundary planting.

It is considered that the category of **Medium** as defined in Table 12-3'Landscape Magnitude Criteria' is most appropriate for the initial Post construction phase, however it is worth noting that over time it is expected that this would further diminish as the development and its associated landscape matures and become an integral feature in this landscape:-

<u>Medium</u> Noticeable change to a significant proportion of the landscape, affecting some key characteristics and the experience of the landscape; and Introduction of some uncharacteristic elements.

Table 12-10 Assessment of landscape impacts (Post Construction / Operational Phase)

		Sensitivity				
		High	**High - Medium**	**Medium**	**Medium – Low**	**Low**
Magnitude	**Very High**	Major	←→	Major	←→	Mod-major
	High	Major	←→	Mod-major	←→	Moderate
	Medium	Mod-major	←→	**Moderate**	←→	Minor
	Low	Moderate	←→	Minor	←→	Negligible
	Very Low	Minor	←→	Negligible	←→	Negligible

Therefore with **Medium-Low** landscape sensitivity combined with **Medium** magnitude of change it is considered that the proposal development would initially generate a **Moderate** impact on the landscape character area during the post construction phase, however this typically would diminish over time. NOTE: As proposed screening planting matures landscape impact is expected to diminish to Minor.

12.5.4 Visual Impacts - Construction Phase

Visual impacts have been illustrated by assessment from specific viewpoints. See Figures 1.6 to 1.41 in Appendix 16.

The figures illustrate key identified visual receptors, with potential visual impacts assessed from each position. Further detail on the visual impacts from each position is provided in each of the figures. Table 12-11 below provides a summary of predicted visual impacts from each of the selected viewpoints during Construction Phase.

These viewpoints are largely representative of worst-case scenario views of the proposed development, therefore, it is important to emphasise that as viewers move away from these receptors, the magnitude of change and potential visual effects will diminish.

Table 12-11 Summary of Visual impacts (Construction Phase)

Viewpoint No.	Receptor Type	Visual Sensitivity	Magnitude of Change	Effect /Impact
Viewpoint 1a & 1b	Intervisibility Images	N/A	N/A	N/A
Viewpoint 2	Primary Road (R132) - Sequential Views	Medium	High	Major-Moderate (A)
Viewpoint 3	Primary Road (R132) - Sequential Views	Medium	Medium	Moderate (A)
Viewpoint 4	Primary Road (R168) - Sequential Views	Medium	Medium	Moderate (A)
Viewpoint 5	Primary Road (R132) - Sequential Views	Medium	Medium	Moderate (A)
Viewpoint 6	Residential Area – Oblique Views	Medium	Medium	Moderate (A)
Viewpoint 7	Minor Road - High Scenic Quality Area	High-Medium	Low	Moderate (A)
Viewpoint 8	Tourism / Heritage Brú na Bóinne Buffer Zone	High	Very Low	Minor (A)
Viewpoint 9	Tourism / Heritage Brú na Bóinne Buffer Zone Designated Viewpoint	High	Low	Moderate (A)
Viewpoint 10	Tourism / Heritage Brú na Bóinne Core Area	High	Very Low	Minor/Negligible (N)

Predicted visual effects arising from the proposals at the selected key visual receptors during the construction phase would range from **Minor** to **Major-Moderate** with the majority of impact type being considered **Adverse** (A).

Of these receptors, only Viewpoint 2 is considered to fall within the 'Significant' category during the construction phase. As construction activity ceases and proposed screen planting matures the magnitude of change at this viewpoint is expected to diminish as reflected in Table 12.11 therefore longer term the visual impacts experienced a Viewpoint 2 would not fall into the Significant range.

12.5.5 Visual Impacts - Post Construction / Operational Phase

Visual impacts have been illustrated by assessment from specific viewpoints. See Figures 1.6 to 1.41 in Appendix 16 which include photomontages.

The figures illustrate key identified visual receptors, with potential visual impacts assessed from each position. Further detail on the visual impacts from each position is provided in each of the figures. Table 12-12 below provides a summary of predicted visual impacts from each of the selected viewpoints during operational phase.

These viewpoints are generally representative of worst-case scenario views of the proposed development, therefore, it is important to emphasise that as viewers move away from these receptors, the magnitude of change and potential visual effects will generally diminish.

Table 12-12 Summary of Visual impacts (Post Construction/ Operational Phase)

Viewpoint No.	Receptor Type	Visual Sensitivity	Magnitude of Change	Effect /Impact
Viewpoint 1a & 1b	Intervisibility Images	N/A	N/A	N/A
Viewpoint 2	Primary Road (R132) - Sequential Views	Medium	Medium	Moderate (N)
Viewpoint 3	Primary Road (R132) - Sequential Views	Medium	Medium	Moderate (N)
Viewpoint 4	Primary Road (R168) - Sequential Views	Medium	Medium	Moderate (N)
Viewpoint 5	Primary Road (R132) - Sequential Views	Medium	Medium	Moderate (N)
Viewpoint 6	Residential Area – Oblique Views	Medium	Medium	Moderate (N)
Viewpoint 7	Minor Road - High Scenic Quality Area	High-Medium	Very Low	Minor (N)
Viewpoint 8	Tourism / Heritage Brú na Bóinne Buffer Zone	High	Very Low	Minor (N)
Viewpoint 9	Tourism / Heritage Brú na Bóinne Buffer Zone Designated Viewpoint	High	Low	Moderate (N)
Viewpoint 10	Tourism / Heritage	High	Very Low	Minor/Negligible (N)

Viewpoint No.	Receptor Type	Visual Sensitivity	Magnitude of Change	Effect /Impact
	Brú na Bóinne Core Area			

Predicted visual effects arising from the proposals at the selected key visual receptors during the Post construction / operational phase would range from **Minor** to **Moderate** with impact type being considered **Neutral** (N)**.**

Of these receptors, None are considered within the 'Significant' category – i.e. Predicted visual effects Moderate – Major or greater.

12.5.6 Cumulative Impacts Arising from other Developments

Effects arising in respect of existing developments are considered within the assessment of the receiving environment, and as such are considered cumulatively with the effects of the proposed development as set out in this Chapter.

In accordance with EIA legislation and Table 3.5 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (see Section 1.9), a search was undertaken for approved developments, but not yet built or operational, of relevance to the consideration of cumulative effects in respect of Landscape and Visual Impact and none were identified.

12.5.7 'Do-nothing' impacts

In the event that the proposed development did not proceed, the effects of the development on Landscape considered in this chapter would not arise. The site would continue to evolve with natural succession being prevalent and turning the habitats on site from grassland to scrub to immature woodland. The woodland would continue to mature with larger trees becoming more dominant, with lesser understorey plants prevalent.

12.5.8 Unplanned Events

Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports indicates that EIARs should address unplanned effects as relevant (examples include accidents, spills, floods and fires). Directive 2014/52/EU further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned. The Directive gives examples of 'flooding, sea level rise, or earthquakes'.

It is considered unlikely that an unplanned event, such as flood, fire, explosion etc would directly or indirectly alter the findings within the Landscape and Visual section.

12.6 Mitigation measures

The purpose of mitigation is to where possible avoid, reduce and offset any significant negative (adverse) effects on the environment arising from a proposed development. If good environmental planning and design principles are applied, together with a flexible approach to design, a high degree of mitigation can be built into a development proposal from the outset.

Mitigation measures may be considered under two categories:

1. Primary mitigation measures - These are an intrinsic part of a proposal, achieved through iterative design development (i.e. Designing out potential issues);
2. Secondary mitigation measures - Designed to specifically targeted to address remaining negative (adverse) effects of the final development proposal.

The focus of this assessment is to identify potential landscape and visual effects generated by the construction of new structures and the proposed operations at this site and recommend mitigation to minimise those effects.

The existing boundary planting along the East, South and Western boundaries are to be retained. All external boundaries shall then be augmented with additional woodland screen planting, in particular significant screening will be introduced as illustrated in the submitted Landscape Planting Plan 'MDA Dwg.23.10.100'

Whilst a portion of ornamental species is proposed in the vicinity of the entrance/ carparking, to offer colour, seasonal variation and focal points, the majority of structure planting throughout the scheme will focus on native species which are informed by the landscape character area.

All built structures to be finished in dark / muted colours to assist with visual integration and avoid contrast.

All lighting to be designed to minimise light spill and glare.

12.7 Monitoring

As the proposed landscape planting around the site matures, ongoing annual monitoring will be required as part of a landscape maintenance and management regime to ensure continual vegetative cover. Where dead or dying plant species occur resulting in gaps or openings, additional planting would be introduced during the next available planting season to augment proposed screening.

12.8 Interactions with other impacts

These effects are typically interactive, i.e. arising from the combined action of a number of different environmental topic areas. For example, the removal of trees not only have potential to generate landscape and visual impact, but can also have an ecological impact.

There are a number of topic areas where interaction impacts can occur along with Landscape and Visual, with key interactive effects in this case being:

Noise /Air Quality

Potential noise and air quality impacts are generally most prevalent during construction phases. Whilst these would have no visual impacts, they can alter people's perception of the areas landscapes character. Measure to minimise noise and air quality impacts will reduce perceived landscape character impacts.

Biodiversity

With the exception of a number of existing hedgerows and regenerative scrub/trees the biodiversity value associated with the site is relatively limited.

The proposed landscape plan offers opportunities to improve the biodiversity through permanent habitat creation along peripheral boundary areas.

12.9 Residual Impacts

The implementation of landscape proposals as illustrated in the submitted landscape planning drawings will greatly assist with the appropriate integration of this development into its setting.

In addition it has been proposed that the finish and colour of the proposed structures (including stacks) should be dark/muted (Green, Blue or Grey) in order to blend and integrate with the surroundings.

Notwithstanding the proposed screening measures it is expected that residual glimpsed and partial views of the development would continue to be achieved from a number of locations surrounding the site.

The proposals would result in some disruption to visual amenity (notably during the construction phase) however as proposed screen planting matures the impacts will reduce.

Landscape sensitivity associated with this site is considered **Medium-Low.**

In terms of magnitude of change this will be **Medium** during the construction phase resulting in an adverse **Moderate** landscape impact.

Once construction has been complete and full landscape scheme implemented, the magnitude of change would be **Medium**, with landscape impacts **Moderate.** It should be noted that over time these impacts are expected to further diminish.

Selected visual receptors are considered representative of typical views of the proposed development site. As illustrated and described in Figures 1.6 – 1.41 in Appendix 16 visual sensitivity at receptors range from **Medium** to **High.**
The magnitude of change during construction range from **High** to **Very Low**

This results in a range of visual effects during construction from **Minor/Negligible** through to **Major/ Moderate.** It should be noted that this wide range of visual effects largely reflects distance from the proposal with the highest effect being encountered in close proximity to the application site. As viewers move away from these key receptors visual sensitivity and magnitude of change diminish, resulting in visual impacts over the majority of the Zone of Theoretical Visual Influence (ZTVI) being considered **Minor** to **Negligible** range.
Post construction as screening measures mature, visual effects will further reduce.

12.10 Bibliography

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Guidance on Heritage Impact Assessments for Cultural World Heritage Properties' prepared by the International Council on Monuments and Sites (IMOCOS) 2011

Louth County Development Plan 2021-2027, Louth County Council, November 2021.

Meath County Development Plan 2021-2027, Meath County Council, September 2021.

13 MATERIAL ASSETS

13.1 Introduction

This chapter has been prepared by Alwyn Flaws, Chartered Civil Engineer of Boylan Consulting. Alwyn Flaws has a Higher Diploma in Science for Civil Engineering and Construction a Batchelor degree of Engineering Civil and Transportation Engineering and Flood Risk Assessment and a Master degree of Science Construction Project Management. The objective of this chapter is to evaluate the impacts, if any, which the proposed development may have on Material Assets as outlined in the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency, May 2022.

The application site is located in the townland of Mell, Co. Louth, approximately 2.5 km north-west of the town of Drogheda, and just to the west of the R132 road. The application site consists of approximately 3.3 Ha of agricultural land. The proposed development will be onto zoned land for 'General Employment' to construct and operate a hot-dip galvanising facility with the capacity to process up to 36,000TPA of steel. The proposed site comprises part of lands to be developed as an IDA business park.

13.2 Methodology

This chapter has been prepared being cognisant of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency, May 2022 and the requirements of the 2014 EIA Directive.

The EPA Guidelines on the information to be contained in EIARs sets out Material Assets to be considered under, amongst other things:

1. Roads & Traffic
2. Built Services – Electricity, Telecommunications, Gas, Water Supply Infrastructure and Sewerage
3. Waste Management

The impacts associated with roads and traffic are duly dealt with under Traffic and Transportation Chapter 9 of this EIAR. It is also considered that the impacts associated with surface water drainage are duly dealt within this chapter and under Chapter 8 (Water) of this EIAR. Waste management is described in Chapter 2.

The extent of the study area is the footprint of the site in question and the immediate upstream and downstream of services connection to the site.

Boylan Consulting undertook various site visits to review the material assets of the subject site. Furthermore, the existing infrastructure and assets on the site and supplying the site have been assessed in line with best practice, workmanship and capacity. From this information a baseline was established of the functionality and adequacy of the existing material assets.

A chartered Civil Engineer reviewed the proposed development operations and drawings to identify impacts on the existing material assets and the functionality of the infrastructure that forms part of the proposed development.

The effects of the proposed development are assessed in accordance with Table 3.4 of Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency, May 2022.

13.3 Characteristics of the development

As part of the proposed development It is planned to process up to 36,000TPA of steel at the plant. Processing will be conducted in-doors. There will be some storage of steel, both processed and non-processed, out-doors.

In summary the proposal includes:

• Construction of a main building with an approximate gross floor area of 5719m2. The building contains.

(i) 'black material' (unprocessed material) jigging area (in-take area)

(ii) Pre-treatment area

(iii) Galvanising (treatment) area

(iv) Galvanised material unjigging area (out-take area)

(v) Services area

(vi) Staff welfare facilities (2 storey over basement)

- • Construction of a main building with an approximate gross floor area of 5719m^2. The building contains
    - (i) 'black material' (unprocessed material) jigging area (in-take area)
    - (ii) Pre-treatment area
    - (iii) Galvanising (treatment) area

(iv) Galvanised material unjigging area (out-take area)

(v) Services area

(vi) Staff welfare facilities (2 storey over basement)

- Construction of 2 No. stacks to extract flue gases from the main and stand-by furnaces respectively. These will be located on the roof at a height of 20 m above finished floor level.
- Construction of 1 No. stack to extract white fumes from the zinc kettle. Exhaust air will be filtered through bag filters. filtered air from the bag filters will then be exhausted to air at 20 m above finished floor level.
- Construction of 1. No. stack to extract exhaust air from the pre-treatment area. Acid vapours produced in the pre-treatment area are passed through a scrubber prior to discharge to air. This stack will be located at 20 m above finished floor level.
- Construction of ESB sub-station within the main building.
- Installation of 2 no. LPG storage tanks.
- Installation of double weighbridge.
- Construction of office building (2 storeys) with an approximate gross floor area of 298m^2.
- Provision of trailer and truck parking spaces.
- Provision of 110 no. visitor and staff parking areas, 2 of which are wheelchair accessible and 7 of which are EV charging locations.
- Provision of 20 no. staff and visitor bicycle parking.
- Provision of concrete yard and additional hardcore yard.
- Installation of stormwater management system.
- Installation of 2 No. rainwater harvesting tanks.
- Construction of soil berm.
- Landscaping works.
- Firewater retention infrastructure.
- Provision of vehicular and pedestrian entrance to the facility, site security fencing and entrance walls and gates.

13.3.1 Power & Electrical Supply

Electrical power, lighting and space heating will be provided via the public electricity network. The installed capacity requirements for the site is 950kVa. This refers to the installed power and not to the effective/average consumption. It is expected that the absorbed value will be approximately half of the installed one because all the equipment will not be used concurrently. An ESB substation will be constructed within the main building. An application connection has been made to the ESB.

13.3.2 Telecommunications

A connection to the public telecommunications network will be required. A connection will be made to the existing ducting in the IDA development park.

13.3.3 Gas

Liquid petroleum gas (LPG) will be used to fuel the furnace for heating the zinc kettle, pre-treatment tanks and drier. LPG will be stored on site in 2 No. 2T tanks. 720,000m3 gas per annum will be consumed by the facility.

13.3.4 Water

It is proposed to connect into an existing 200mm dia uPVC water pipe located under the footpath on the northern side of the access road linking Chapel Lane to the R132 to the north of the site. This pipe is not currently connected to the Irish Water Network. Onward connection between the wider IDA lands and the Irish Water network will be completed as part of IDA Ireland's plans for the wider lands at this location, and these works do not comprise part of the subject application proposals. A 100mm diameter uPVC ring main will be laid within the proposed site. The ring main will house hydrants to comply with the requirements of a fire safety certificate for the proposed new buildings. Water connections will be taken off the ring main to service the main building and office as required. Rainwater is planned to be harvested at the site to supplement this supply.

In respect of IDA Ireland's plans for the wider IDA lands at this location mentioned above, IDA Ireland has advised it will be carrying out an entire infrastructure enhancement project, which is endorsed by the IDA Board and capital expenditure plans in 2023. IDA Ireland has advised it has published its tender to complete the works (closing date 31st May 2023), and forecasts completion of the works in early Q1 2024.

13.3.5 Wastewater

It is proposed to connect into an existing 225mm dia wastewater pipe located under the access road linking Chapel Lane to the R132 to the north of the site. This pipe is not currently connected to the Irish Water Network. Onward connection between the wider IDA lands and the Irish Water network will be completed as part of IDA Ireland's plans for the wider lands at this location, and these works do not comprise part of the subject application proposals. A 150mm diameter wastewater pipe will be laid within the proposed site.

In respect of IDA Ireland's plans for the wider IDA lands at this location mentioned above, IDA Ireland has advised it will be carrying out an entire infrastructure enhancement project, which is endorsed by the IDA Board and capital expenditure plans in 2023. IDA Ireland has advised it has published its tender to complete the works (closing date 31st May 2023), and forecasts completion of the works in early Q1 2024.

13.3.6 Proposed Boundary Treatments

An improvement on to the site boundary has been identified as an important part of the project for a variety of reasons but in particular to mitigate visual and noise impacts whilst also improving the security of the existing site. It is proposed to provide additional boundary treatments along the entire site boundary.

Northern Boundary

A low-level wall with 1.2m high fence will provide security to the direct interface with the site access road and public footpath. Hornbeam hedging will be planted in the inside of the fence/wall and will provide additional screening.

Eastern, Southern and Western Boundary

Landscaping including planting of woodland species will help to mitigate the visual and noise impacts of the proposed development. A 3m high soil berm plus 1m high impermeable fence will be constructed on the western boundary to reduce potential impacts on the closest neighbours.

13.4 Receiving environment

13.4.1 Power & Electrical Supply

Assumed 38 kv overhead powerlines traverse within the Eastern and Western boundaries of the site. Through coordination with the ESB these powerlines will either be diverted or re-laid underground.

13.4.2 Water

The site is does not have an existing water connection. There are existing 200mm diameter and 150mm diameter PVC water pipes along the access road linking Chapel Lane to the R132 to the north of the site. These pipes are not currently connected to the Irish Water Network.

13.4.3 Wastewater

The site is does not have an existing wastewater connection. There are existing 225mm diameter pipe that rungs along the access road linking Chapel Lane to the R132 to the north of the site. These pipes are not currently connected to the Irish Water Network.

13.4.4 Telecommunications

The site does not have an existing connection to telecommunications. There is an existing network of telecommunications ducting in the access road linking Chapel Lane to the R132 to the north of the site. We are unaware whether this is currently connected to telecoms networks.

13.4.5 Gas

The site does not have an existing connection to the Gas network. Gas supply for the proposed development will be via on-site storage tanks.

13.4.6 Boundary Treatments

There are no formal boundary treatments along the northern boundary of the site where a public footpath runs along in an east to west direction.

The remaining eastern, southern, and western boundaries are vegetated with mature and semi mature trees and hedging of varying species.

13.5 Impacts of the development

The proposed activities on site will require significant additional infrastructure in order to carry out operations without causing an increase in environmental impacts.

The design intent of the proposed infrastructure is to mitigate against excessive increases in demand on existing material assets, ensuring that any increases in demand are within the capacity of the existing material assets.

Upon review of the proposed infrastructure, the potential impacts on the receiving material assets were identified and an assessment carried out to identify potential effects, in accordance with the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency, May 2022. The assessment of the potential impacts of the proposed development are assessed as part of the construction process and operational stages.

13.5.1 Direct Impacts

The potential direct impacts of the construction and operation of the development are considered to be:

- Impacts associated with temporary shutdown of services due to diversion, connections, and augmentation during construction of the proposed development causing an impact on service delivery to other potential premises of the IDA site and the wider community.
- Significant increase in electrical demand, utilising network capacity causing supply issues to other potential premises of the IDA site and the wider community.
- Damage to existing overhead transmission lines or poles causing disruption to regional power supply.

The effects of the direct impacts are considered in this chapter and tabulated in Table 13-1.

13.5.2 Indirect Impacts

Indirect impacts (or secondary impacts) are those which are not a direct result of the project, often produced away from the project site or because of a complex pathway. It is assessed unlikely that any indirect significant effects are created as a result of the proposed development.

13.5.3 Power & Electrical Supply

Power and Electrical Supply – Construction Process

The majority of the construction works will be completed by a civil engineering contractor using heavy plant and equipment. It is reasonably assumed that the plant and equipment utilised to complete the construction works will be diesel driven self-propelled equipment with no requirement for utilisation of existing power supply to the site. The internal fit out of the proposed buildings will be minimal and will involve trades utilising small power tools. The additional demand used during construction and commission will be temporary and would be imperceptible on the supply to the IDA site and wider community. The construction and commissioning stage will have a neutral effect on power and electricity supply.

Power & Electrical Supply – Operational Stage

The facility will consume approximately 810,000kWh/yr of electrical power. An ESB substation will be constructed within the main building.

The proposed operation is not anticipated to have any likely significant effects on electrical supply either directly or indirectly.

13.5.4 Watermain

Water Supply – Construction Process

There will be very little demand for water during the construction phase and will be tinkered on-site as required. The materials of proposed construction work fabric will have a low to no demand for water in their construction processes. The majority of the water demand for this project would be to service a construction site welfare unit. Based on an average construction staff of 10 personnel, typically 0.8m3 of water will be required per day to service the welfare facilities. The additional demand used during construction and commission will be temporary and would be imperceptible on the sites supply. The construction stage will have a neutral effect on water supply.

Water Supply – Operation Stage

There will be a requirement for a water connection to the site during the operational phase. It is proposed to connect into the 200mm diameter water pipe in the access road linking Chapel Lane to the R132 to the north of the site, mentioned in Section 2.3.5. (As mentioned in Section 2.3.5, this pipe is not currently connected to the Irish Water Network, onward connection between the wider IDA lands and the Irish Water network will be completed as part of IDA Ireland's plans for the wider lands at this location, and these works do not comprise part of the subject application proposals).The proposed increased activities will require water for processing and therefore an increased water demand. The water demand will result in an increase in personnel from 0 to the proposed 100 staff will be catered for by the IDA Ireland's infrastructure enhancement project mentioned in Section 2.3.5. Operational water demand will be minimized as much as possible by the use of rainwater harvesting within the proposed development. It is anticipated that the impact of increased water demand in relation to the processes of the plant will be imperceptible.

13.5.5 Wastewater

Wastewater – Construction Process

There will be a requirement for a wastewater connection to the site during the construction phase. It is proposed to connect into the 225mm diameter pipe in the access road linking Chapel Lane to the R132 to the north of the site, mentioned in Section 2.3.5. (As mentioned in Section 2.3.5, this pipe is not currently connected to the Irish Water Network, onward connection between the wider IDA lands and the Irish Water network will be completed as part of IDA Ireland's plans for the wider lands at this location, and these works do not comprise part of the subject application proposals). There will be very little extra loading to the wastewater network during the construction phase. The majority of the wastewater loading for this project will be from the construction site welfare unit. The additional loading caused during construction will be temporary and would be imperceptible. The construction stage will have a neutral effect on wastewater loading.

Wastewater – Operation Stage

The proposed increased activities will cause an increase wastewater water loading. The wastewater loading will result in an increase in personnel from 0 to the proposed 100 staff will be catered for by site infrastructure and the IDA Ireland's infrastructure enhancement project mentioned in Section 2.3.5. It is anticipated that the impact of increased wastewater loading will be imperceptible.

13.5.6 Telecommunications

There is only a basic requirement for additional communication infrastructure on the site to facilitate broadband and landline phone connections. There will also be an internal CCTV and alarm system which will be independent of existing infrastructure. It is anticipated that the development will have a neutral effect on communication infrastructure during both construction and operation stages.

13.5.7 Proposed Boundary Treatments

Northern Boundary – Construction Process

The construction of the Northern Boundary wall/fence and planting will have a neutral effect on the existing IDA site and wider area.

Northern Boundary – Operation Process

The provision of a northern boundary wall/fence will provide significantly improved security to the northern boundary. The proposed wall will have a moderate positive effect on the IDA site and wider environment.

Eastern, Southern and Western Boundary – Construction Process

The construction of the soil berm on the western boundary will have a temporary – not significant effect on existing tree root zones, the IDA site, and the wider environment.

Eastern, Southern and Western Boundary – Operation Process

The provision of the soil berm and landscaping will provide significantly improved security to the eastern, southern and western boundaries while also providing an attractive visual screen to the operations of the site, whilst also providing noise mitigation. The proposed landscape will have a long-term moderate positive effect on the development's environment.

13.5.8 Unplanned Events

Section 3.3.6 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports indicates that EIARs should address unplanned effects as relevant (examples include accidents, spills, floods and fires). Directive 2014/52/EU further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned. The Directive gives examples of 'flooding, sea level rise, or earthquakes'.
It is considered unlikely that an unplanned event, such as flood, fire, explosion etc would directly or indirectly alter the findings within the Material Assets section of this EIAR.

13.5.9 Do-Nothing Impacts

As this chapter assessed the impact of the proposed development on material assets, the do nothing impact of this proposed development will neither improve nor impair the existing material assets.

13.5.10 Cumulative Impacts

Effects arising in respect of existing developments are considered within the assessment of the receiving environment, and as such are considered cumulatively with the effects of the proposed development as set out in this Chapter.

In accordance with EIA legislation and Table 3.5 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (see Section 1.9 of Chapter 1), a search was undertaken for approved developments, but not yet built or operational, of relevance to the consideration of cumulative effects in respect of Material Assets and none were identified.

Table 13-1 - Table of Impacts

Scenarios where Impacts may arise	Potential Impact				Quality of Effect	Significance of Effect	Extent/Context of Effect	Probability	Duration	Type of Effect (as per Table 3.3)
	Activity	Attribute	Importance of attribute/sensitivity of receiving environment	Nature of Effect (description)						
Construction phase	General construction work	Electrical supply	Low;	Direct: Construction processes utilising significant capacity of asset	Neutral	Imperceptible	Local	Unlikely	Temporary	***Indirect***: are discussed in 13.5.2 ***Cumulative effects*** are discussed in Section 13.5.10, ***Do-nothing Effects*** are discussed in Section 13.5.9, ***Residual effects*** are discussed in Section 13.8
Operational phase	General Operation	Electrical Supply	Low;	Direct: Operation of facility utilising significant capacity of asset causing disruption	Neutral	Imperceptible	Local	Likely	Long-term	**Indirect:** No indirect impacts are assumed **Cumulative effects** are discussed in Section 13.5.10, **Do-nothing Effects** are discussed in Section 13.5.9, **Residual effects** are discussed in Section 13.8
	General Operation	Water Supply	Low;	Direct: Operation of facility utilising significant capacity of asset causing disruption	Neutral	Imperceptible	Local	Likely	Long-term	
	General Operation	Boundary Treatment	Low;	Direct: Proposed boundary treatment provides increased security to site.	Neutral	Imperceptible	Around site boundary	Likely	Long-term	
Unplanned Events										

13.6 Mitigation measures

13.6.1 Construction Process

ESB overhead lines will be protected during construction works as per the ESB code of practice for protection of overhead lines.

Silt fencing will be provided to prevent silt run-off during the construction stage

Temporary site security fencing will be provided to ensure security / safety during the development.

13.6.2 Operation Stage

As the proposed demand will have an imperceptible impact on existing material assets no mitigation measures are required.

Table 13-2 - Mitigation Measures

Scenarios where Impacts may arise	Potential Impact			Mitigation measures	Residual impacts (post mitigation)	
	Activity	Attribute/receiving environment	Nature of Effect (description)	Description	Significance or quality of Effect	Probability
Construction phase	General construction work	Electrical supply	Construction processes utilising significant capacity of asset	Self-propelled construction plant.. Code of practice for working under overhead powerlines will be complied with.	Imperceptible	Unlikely
	General construction work	Surface water	Silt-laden water discharging off-site into local water course	Install silt fence	Imperceptible	Unlikely
Operational phase						
Unplanned events						

13.7 Monitoring measures

There are no specific monitoring measures proposed for the development in relation to material assets.

13.8 Residual impacts

The proposed development will require minimal use of material assets examined in this chapter during construction with an imperceptible impact during operation. The overall predicted impact of the proposed development will be imperceptible with respect to the material assets assessed in this chapter.

13.9 Interactions with other impacts

No interactions with other impacts have been identified.

13.10 Bibliography

Environmental Protection Agency (May 2022). 'Guidelines on the information to be contained in Environmental Impact Assessment Report

14 INTERACTIONS OF THE FOREGOING

14.1 Introduction

This chapter of the EIAR was prepared on behalf of Boylan Consulting by Steven Peck, BA (Hons), MA, MRTPI, and approved by Cathal Boylan, BEng. (Hons) Engineering, Director at Boylan Consulting. Steven Peck is a Chartered Town Planner with significant experience in EIA projects including large infrastructure and urban development projects. As Director at Boylan Consulting Cathal Boylan has overseen numerous EIA projects, and prior to setting up Boylan Consulting Cathal Boylan worked as a Project Manager with ESB International, on numerous applications for large scale infrastructural projects many of which were supported by the EIA process. Cathal is a Chartered Engineer and is a member of Engineers Ireland.

An important aspect of the EIA process is to ensure that interactions between effects on the different environmental factors have been addressed.

Article 3(1) of Directive 2014/52/EU requires that [our emphasis]:

'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 the following factors: a) population and human health; b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC; c) land, soil, water, air and climate; d) material assets, cultural heritage and the landscape; e) the interaction between the factors referred to in points (a) to (d).'

Guidance in respect of interactions at Section 3.7.6 of the Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports includes that the interactions between effects on different environmental factors should be addressed as relevant throughout the EIAR, that close coordination and management within the EIA team is needed to ensure that interactions are adequately addressed throughout an EIAR, and that it is general practice to include a matrix to show where interactions between effects on different factors have been addressed.

In preparing and co-ordinating this EIAR, Boylan Consulting ensured that the team of specialist consultants addressed interactions between effects on the different environmental factors predicted as a result of the proposed development, and interactions between effects on the different environmental factors have been addressed as relevant across the EIAR across chapters 4-13. The purpose of this chapter is to show where principal interactions between effects on the different factors have been addressed within the EIAR. In accordance with the Environmental Protection Agency Guidelines, a matrix of interactions is provided.

14.2 Interactions

Table 14-1 Matrix of interactions between factors.

Interaction	Population and Human Health	Biodiversity	Cultural Heritage	Land, Soils and Geology	Water	Traffic and Transportation	Noise	Air Quality and Climate	Landscape and Visual	Material Assets
Population and Human Health										
Biodiversity										
Cultural Heritage										
Land, Soils and Geology										
Water										
Traffic and Transportation										
Noise										
Air Quality and Climate										
Landscape and Visual										
Material Assets										

	Principal Interaction

The principal interactions may be summarised as follows:

- Effects on Biodiversity interact with Landscape and Visual – This interaction is intrinsic to the assessment within Chapter 12 Landscape & Visual Impact. Please refer to Chapter 12 for details.
- Effects on Land, Soils and Geology interact with Biodiversity, Water and Landscape and Visual, respectively – These interactions, respectively, are intrinsic to the assessments within Chapter 5 Biodiversity, Chapter 8 Water and Chapter 12 Landscape & Visual Impact, respectively. Please refer to chapters 5, 8 and 12, respectively, for details.
- Effects on Water interact with Population and Human Health and Biodiversity, respectively – These interactions, respectively, are intrinsic to the assessments within Chapter 4 Population & Human Health and Chapter 5 Biodiversity, respectively. Please refer to chapters 4 and 5, respectively, for details.
- Effects on Traffic and Transportation interact with Population and Human Health, Noise and Air Quality and Climate, respectively – These interactions, respectively, are intrinsic to the assessments within Chapter 4 Population & Human Health, Chapter 10 Noise and Chapter 11

Air Quality and Climate, respectively. Please refer to chapters 4, 10 and 11, respectively, for details.

- Effects on Noise interact with Population and Human Health – This interaction is intrinsic to the assessment within Chapter 4 Population & Human Health. Please refer to Chapter 4 for details.
- Effects on Air Quality and Climate interact with Population and Human Health and Biodiversity, respectively – These interactions, respectively, are intrinsic to the assessments within Chapter 4 Population & Human Health and Chapter 5 Biodiversity, respectively. Please refer to chapters 4 and 5, respectively, for details.