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Methodology used in Preparation of the EIAR

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Table of Abbreviations

Acronym	Meaning
AZ	Assessment Zone
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
NTA	National Transport Authority
RO	Railway Order
TII	Transport Infrastructure Ireland

2. Methodology used in Preparation of EIAR

2.1 Introduction

Environmental Impact Assessment (EIA) is the process consisting of:

- The preparation of an environmental impact assessment report (EIAR) by a developer;
- The carrying out of consultations;
- The examination by a competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer, and any relevant information received through the consultations;
- The reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (iii) and, where appropriate, its own supplementary examination; and
- The integration of the competent authority's reasoned conclusion into any decision to grant consent.

This chapter of the EIAR describes,

- The legal provision for EIA with respect to the MetroLink Project (hereafter referred to as the proposed Project) which comprises of an application to An Bord Pleanála (hereafter referred to as the Board) for a Railway Order (RO);
- The legislative requirements for EIA with respect to the proposed Project;
- The EIA process and methodology for identifying, predicting and evaluating the effects (both positive and negative) on the receiving environment caused by the proposed Project and mitigating negative effects; and
- The methodology and structure by which the EIAR was compiled to allow the Board to undertake an EIA.

2.2 EIA Legislation

Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU (hereafter referred to as the 'EIA Directive') sets the requirements for EIA in European law. It requires EIA to be carried out for certain public and private projects listed in Annexes I and II of the EIA Directive.

The requirements of Directive 2014/52/EU were transposed into Irish law with the adoption of the S.I. No. 743/2021 - European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021 (hereafter referred to as the EIA Regulations), which amend the Transport (Railway Infrastructure) Act 2001 to bring it in line with Directive 2014/52/EU (see Sections 2.2.1 and 2.2.3).

The EIA Directive requires that Ireland and other Member States must decide which '*underground railways, suspended lines or similar lines of a particular type, used exclusively or mainly for passenger transport*' require EIA through a case-by-case examination or the use of thresholds or both.

In Ireland's case, the applicant for an RO must submit an EIAR with the application for an RO to the Board as required by the Section 37(3)(e) of the Transport (Railway Infrastructure) Act, 2001 (as amended). This EIAR complies with the requirements of section 37(3)(e) and 39 of the Transport (Railway Infrastructure) Act 2001 and Annex IV to the EIA Directive.

2.2.1 Requirements for EIA under the Transport (Railway Infrastructure) Act 2001

New railway works are governed by the Transport (Railway Infrastructure) Act, 2001 (as amended), hereafter referred to as the '2001 Act'. The 2001 Act provides for an RO application to be made by TII to the Board.

Sections 37 to 47F of the 2001 Act (as amended by the Planning and Development (Strategic Infrastructure) Act 2006, the Dublin Transport Authority Act 2008 and the European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021 (S.I. No. 743/2021)) set out the process required for making an application for an RO. Section 37(3) states that,

'An application under Subsection (1) shall be made in writing in such form as the Minister may specify and shall be accompanied by-

(a) a draft of the proposed order,

(b) a plan of the proposed railway works,

(c) in the case of an application by the Agency or a person with the consent of the Agency, a plan of any proposed commercial development of land adjacent to the proposed railway works,

(d) a book of reference to a plan required under this subsection (indicating the identity of the owners and of the occupiers of the lands described in the plan), and

(e) a statement of the likely effects on the environment (referred to subsequently in this Part as an 'environmental impact assessment report') of the proposed railway works, and a draft plan and book of reference shall be in such form as the Minister may specify or in a form to the like effect.'

Section 39 of the 2001 Act (as amended by the Planning and Development (Strategic Infrastructure) Act 2006 and the European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021 (S.I. No. 743/2021)) specifies the information that must be provided in the EIAR that accompanies an RO application. Subsections 1 and 2 outline the following requirements:

'(1) The applicant shall ensure that an environmental impact assessment report-

(a) is prepared by competent experts,

(b) subject to subsection (3), contains -

(i) a description of the proposed railway works comprising information on the site, design, size and other relevant features of the proposed works,

(ii) a description of the likely significant effects of the proposed railway works on the environment,

(iii) the data required to identify and assess the main effects which the proposed railway works are likely to have on the environment,

(iv) a description of any features of the proposed railway works, and of any measures envisaged, to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment,

(v) a description of the reasonable alternatives studied by the applicant which are relevant to the proposed railway works and their specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the railway works on the environment, and

(vi) a summary in non-technical language of the above information.

(c) takes into account the available results of other relevant assessments under European Union or national legislation with a view to avoiding duplication of assessments.

(2) The applicant shall further ensure that an environmental impact assessment report, in addition to and by way of explanation or amplification of the specified information referred to in subsection (1), contains any additional information specified in Annex IV to the EIA Directive relevant to the specific

characteristics of the particular railway works, or type of railway works proposed and to the environmental features likely to be affected.'

Section 37(4) of the 2001 Act, as amended, sets out that 'The construction of railway works, the subject of an application for a RO under this Part, shall not be undertaken unless the Board has granted an order under Section 43'.

2.2.2 Planning and Development (Strategic Infrastructure) Act 2006

It is noted that Section 6(c) of the Planning and Development (Strategic Infrastructure) Act 2006 amended the definitions Section (Section 2(1)(g)) in the Planning and Development Act 2000 so that the definition of 'Strategic Infrastructure Development' includes inter alia any proposed railway works referred to in Section 37(3) of the Transport (Railway Infrastructure) Act 2001 (as amended by the Planning and Development (Strategic Infrastructure) Act 2006). The proposed Project is considered Strategic Infrastructure Development (SID) under the Planning and Development (Strategic Infrastructure) Act 2006.

2.2.3 Key Changes in the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU

EIA Directive 2014/52/EU introduced new requirements for an EIA. The various amendments introduced in the 2014 Directive aim to strengthen the quality of the EIA process and are in line with the drive for smarter regulation and reduced administrative burden. The amendments to the EIA Directive also sought to improve the level of environmental protection, with a view to making business decisions on public and private investments more sound, more predictable and sustainable in the longer term.

One of the amendments to the EIA Directive brought in by Directive 2014/52/EU was to refer to an environmental impact assessment report, hence the term EIAR now replaces EIS (environmental impact statement) as was used prior to transposition of the amendment Directive 2014/52/EU. Further key changes to the EIA Directive introduced by Directive 2014/52/EU are as follows:

- The reduction in the administrative burden by way of co-ordinated procedures in the event that Appropriate Assessment is required;
- Additional information to be provided in the project description to describe the location of the project, the technologies and substances used, the construction of the project and required demolition;
- The requirement for consideration of alternatives has changed from a requirement to provide 'An outline of the main alternatives studied by the developer and an indication of the main reasons for this choice, taking into account the environmental effects' to 'a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment';
- A refinement of the environmental factors to be considered in the assessment with an increased focus on resource efficiency, climate change, biodiversity and disaster prevention;
- Changes to Prescribed Environmental Factors with 'Land' being added, 'Human Beings' replaced by 'Population & Human Health' and 'Flora & Fauna' replaced by 'Biodiversity';
- Information to be contained in the EIAR to be expanded;
- The developer is required to have competent experts to prepare the EIAR and the Board is required to have access to sufficient expertise to assess the EIAR;
- Requirement for the incorporation of mitigation and monitoring measures in consents and ensuring that developers deliver these measures;
- The requirements for the assessment of cumulative effects with existing and/or approved projects, taking into account existing environmental issues to be considered; and
- Reasoned decisions made with regard to the EIA outcomes must be provided.

As noted above the European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021 (S.I. No. 743/2021) amend the 2001 Act, to include the requirements of Directive 2014/52/EU. The EIAR prepared for the proposed Project has regard to the Article 5(1) and Annex IV of the EIA Directive, Section 39 of the 2001 Act as amended by regulation 6(a) of S.I. No. 743/2021, and the

Guidelines on the Information to be contained in an EIAR, (Environmental Protection Agency (EPA) 2022). Table 2.1 sets out a list of information required and a guide as to where it can be found within the EIAR.

Table 2.1: Information Required under EIA Directive and the Transport (Railway Infrastructure) Act 2001 (as amended)

EIA Directive Information Requirements	Transport (Railway Infrastructure) Act 2001 S39 as amended by Regulation 6(a) of S.I. No. 743/2021).	Where this Information can be Found in the EIAR
EIA Directive Article 5(1)		
(a) a description of the project comprising information on the site, design, size and other relevant features of the project.	(1)(b)(i) a description of the proposed railway works comprising information on the site, design, size and other relevant features of the proposed works	Volume 2: Introduction and Project Description Chapters <ul style="list-style-type: none"> ▪ Chapter 4: Project Description
(b) a description of the likely significant effects of the project on the environment.	(1)(b)(ii) a description of the likely significant effects of the proposed railway works on the environment	Volume 3: Environmental Baseline and Assessment Chapters <ul style="list-style-type: none"> ▪ Chapters 9 - 28
	(1)(b)(iii) the data required to identify and assess the main effects which the proposed railway works are likely to have on the environment	Volume 5: Appendices
(c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment.	(1)(b)(iv) a description of any features of the proposed railway works, and of any measures envisaged, to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment	Volume 3: Environmental Baseline and Assessment Chapters <ul style="list-style-type: none"> ▪ Chapters 9 - 28 (See Section 2.5.3 for how discipline chapters are structured to include this information)
(d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment	(1)(b)(v) a description of the reasonable alternatives studied by the applicant which are relevant to the proposed railway works and their specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the railway works on the environment	Volume 2: Introduction and Project Description Chapters <ul style="list-style-type: none"> ▪ Chapter 7: Consideration of Alternatives
(e) a non-technical summary of the information referred to in points (a) to (d).	(1)(b)(vi) a summary in non-technical language of the above information.	Volume 1: Non-Technical Summary
(f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.	(2) The applicant shall further ensure that an environmental impact assessment report, in addition to and by way of explanation or amplification of the specified information referred to in subsection (1), contains any additional information specified in Annex IV to the EIA Directive	Volume 2: Introduction and Project Description Chapters <ul style="list-style-type: none"> ▪ Chapter 4 (Description of the MetroLink Project) ▪ Chapter 5 (MetroLink Construction Phase) ▪ Chapter 6 (MetroLink Operations & Maintenance)

EIA Directive Information Requirements	Transport (Railway Infrastructure) Act 2001 S39 as amended by Regulation 6(a) of S.I. No. 743/2021).	Where this Information can be Found in the EIAR
	<p>relevant to the specific characteristics of the particular railway works, or type of railway works, proposed and to the environmental features likely to be affected.</p>	<p>Volume 3: Environmental Baseline and Assessment Chapters</p> <ul style="list-style-type: none"> ▪ Chapters 9 - 28 <p>Volume 5: Appendices</p>
<p>EIA Directive Annex IV (Information for the Environmental Impact Assessment Report)</p>		
<p>1. Description of the project, including in particular:</p> <p>(a) a description of the location of the project;</p> <p>(b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;</p> <p>(c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used.</p>	<p>(2) The applicant shall further ensure that an environmental impact assessment report, in addition to and by way of explanation or amplification of the specified information referred to in subsection (1), contains any additional information specified in Annex IV to the EIA Directive relevant to the specific characteristics of the particular railway works, or type of railway works, proposed and to the environmental features likely to be affected.</p>	<p>Volume 2: Introduction and Project Description Chapters</p> <ul style="list-style-type: none"> ▪ Chapter 4 (Description of the MetroLink Project) ▪ Chapter 5 (MetroLink Construction Phase) ▪ Chapter 6 (MetroLink Operations & Maintenance) <p>Volume 5: Appendices</p>
<p>(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.</p>	<p>(2) The applicant shall further ensure that an environmental impact assessment report, in addition to and by way of explanation or amplification of the specified information referred to in subsection (1), contains any additional information specified in Annex IV to the EIA Directive relevant to the specific characteristics of the particular railway works, or type of railway works, proposed and to the environmental features likely to be affected.</p>	<p>Volume 3: Environmental Baseline and Assessment Chapters</p> <ul style="list-style-type: none"> ▪ Chapters 9 – 28 <p>(See Section 2.5.3 for how discipline chapters are structured to include this information)</p>
<p>2. 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.</p>	<p>(1)(b)(v) a description of the reasonable alternatives studied by the applicant which are relevant to the proposed railway works and their specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the railway works on the environment</p>	<p>Volume 2: Introduction and Project Description Chapters</p> <ul style="list-style-type: none"> ▪ Chapter 7: Consideration of Alternatives

EIA Directive Information Requirements	Transport (Railway Infrastructure) Act 2001 S39 as amended by Regulation 6(a) of S.I. No. 743/2021).	Where this Information can be Found in the EIAR
<p>3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.</p>	<p>(2) The applicant shall further ensure that an environmental impact assessment report, in addition to and by way of explanation or amplification of the specified information referred to in subsection (1), contains any additional information specified in Annex IV to the EIA Directive relevant to the specific characteristics of the particular railway works, or type of railway works, proposed and to the environmental features likely to be affected.</p>	<p>Volume 3: Environmental Baseline and Assessment Chapters</p> <ul style="list-style-type: none"> ▪ Chapters 9 – 28 <p>(See Section 2.5.3 for how discipline chapters are structured to include this information)</p>
<p>4. A description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.</p>	<p>(1)(b)(ii) a description of the likely significant effects of the proposed railway works on the environment</p> <p>(2) The applicant shall further ensure that an environmental impact assessment report, in addition to and by way of explanation or amplification of the specified information referred to in subsection (1), contains any additional information specified in Annex IV to the EIA Directive relevant to the specific characteristics of the particular railway works, or type of railway works, proposed and to the environmental features likely to be affected.</p>	<p>Volume 3: Environmental Baseline and Assessment Chapters</p> <ul style="list-style-type: none"> ▪ Chapters 9 – 28 <p>(See Section 2.5.3 for how discipline chapters are structured to include this information)</p>
<p>5. A description of the likely significant effects of the project on the environment resulting from, inter alia:</p> <p>(a) the construction and existence of the project, including, where relevant, demolition works;</p> <p>(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;</p> <p>(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;</p> <p>(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);</p> <p>(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing</p>	<p>(2) The applicant shall further ensure that an environmental impact assessment report, in addition to and by way of explanation or amplification of the specified information referred to in subsection (1), contains any additional information specified in Annex IV to the EIA Directive relevant to the specific characteristics of the particular railway works, or type of railway works, proposed and to the environmental features likely to be affected.</p>	<p>Volume 3: Environmental Baseline and Assessment Chapters</p> <ul style="list-style-type: none"> ▪ Chapters 9 – 28 <p>(See Section 2.5.3 for how discipline chapters are structured to include this information)</p>

EIA Directive Information Requirements	Transport (Railway Infrastructure) Act 2001 S39 as amended by Regulation 6(a) of S.I. No. 743/2021).	Where this Information can be Found in the EIAR
<p>environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;</p> <p>(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;</p> <p>(g) the technologies and the substances used</p> <p>The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project</p>		
<p>6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.</p>	<p>(2) The applicant shall further ensure that an environmental impact assessment report, in addition to and by way of explanation or amplification of the specified information referred to in subsection (1), contains any additional information specified in Annex IV to the EIA Directive relevant to the specific characteristics of the particular railway works, or type of railway works, proposed and to the environmental features likely to be affected.</p>	<p>Volume 3: Environmental Baseline and Assessment Chapters</p> <ul style="list-style-type: none"> ▪ Chapters 9 – 28 <p>(See Section 2.5.3 for how discipline chapters are structured to include this information)</p>
<p>7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.</p>	<p>(1)(b)(iv) a description of any features of the proposed railway works, and of any measures envisaged, to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment</p>	<p>Volume 3: Environmental Baseline and Assessment Chapters</p> <ul style="list-style-type: none"> ▪ Chapters 9 – 28 <p>(See Section 2.5.3 for how discipline chapters are structured to include this information)</p>
<p>8. A description of the expected significant adverse effects of the project on the environment deriving from the</p>	<p>(2) The applicant shall further ensure that an environmental impact assessment report, in</p>	<p>Volume 3: Environmental Baseline and Assessment Chapters</p>

EIA Directive Information Requirements	Transport (Railway Infrastructure) Act 2001 S39 as amended by Regulation 6(a) of S.I. No. 743/2021).	Where this Information can be Found in the EIAR
<p>vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council (*) or Council Directive 2009/71/Euratom (**) or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.</p> <p>-----</p> <p>(*) Directive 2012/18/EU of the European Parliament and the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC (OJ L 197, 24.7.2012, p. 1).</p> <p>(**) Council Directive 2009/71/Euratom of 25 June 2009 establishing a community framework for the nuclear safety of nuclear installations (OJ L 172, 2.7.2009, p. 18).'</p>	<p>addition to and by way of explanation or amplification of the specified information referred to in subsection (1), contains any additional information specified in Annex IV to the EIA Directive relevant to the specific characteristics of the particular railway works, or type of railway works, proposed and to the environmental features likely to be affected.</p>	<ul style="list-style-type: none"> ▪ Chapter 28 Risk of Major Accidents and Disasters
<p>9. A non-technical summary of the information provided under points 1 to 8.</p>	<p>(1)(b)(vi) a summary in non-technical language of the above information.</p>	<p>Volume 1: Non-Technical Summary</p>
<p>10. A reference list detailing the sources used for the descriptions and assessments included in the report.</p>	<p>(2) The applicant shall further ensure that an environmental impact assessment report, in addition to and by way of explanation or amplification of the specified information referred to in subsection (1), contains any additional information specified in Annex IV to the EIA Directive relevant to the specific characteristics of the particular railway works, or type of railway works, proposed and to the environmental features likely to be affected.</p>	<p>Each chapter in this EIAR includes a reference list.</p>

2.3 EIAR Guidance

The approach to the assessment of environmental impacts has been completed in accordance with, but not limited to the following:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022);
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA 2002);
- Advice notes on Current Practice in the preparation of Environmental Impact Statements (EPA 2003) and draft revised notes for preparing Environmental Impact Statements (EPA draft September 2015);
- Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2017);
- Environmental Assessments of Plans, Programmes and Projects – Rulings of the Court of Justice of the European Union (European Union 2017a);
- Environmental Impact Assessment of Projects – Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU) (European Union 2017b);
- Guidance of Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Union 2013);
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Union 2017c);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Local Government and Heritage, 2018); and
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Commission 1999).

In addition to the applicable EIA legislation and guidance, all EU Directives and national legislation relating to the specialist areas have also been considered as part of the process and are addressed in the relevant assessment chapters. Subject-specific best practice guidance used for each appraisal presented in the EIAR is detailed in the relevant assessment chapter of this EIAR.

2.4 EIA Process

In the case of this application for an RO, EIA is the process by which the likely significant effects on the environment (positive and negative) of the proposed Project are assessed by the Board. Article 1(g) of the EIA Directive defines EIA as a process consisting of:

- The preparation of the EIAR by the developer;
- The carrying out of consultations with the public, prescribed bodies and any other EU Member States where transboundary effects have the potential to occur. The proposed Project does not have the potential to cause transboundary effects;
- The examination by competent authority of the information presented in the EIAR, any supplementary information provided by the developer and any relevant information received through consultations;
- The reasoned conclusions by the competent authority on the significant effect of the project on the environment, taking into account the examination referred to above and, where appropriate, its own supplementary examination; and
- The integration of the competent authority's reasoned conclusion on the significance of the effects into its decision to grant consent, refuse consent or grant consent with conditions.

In the case of the proposed Project, the competent authority is the Board. An overview of the EIA process is presented in Diagram 2.1.

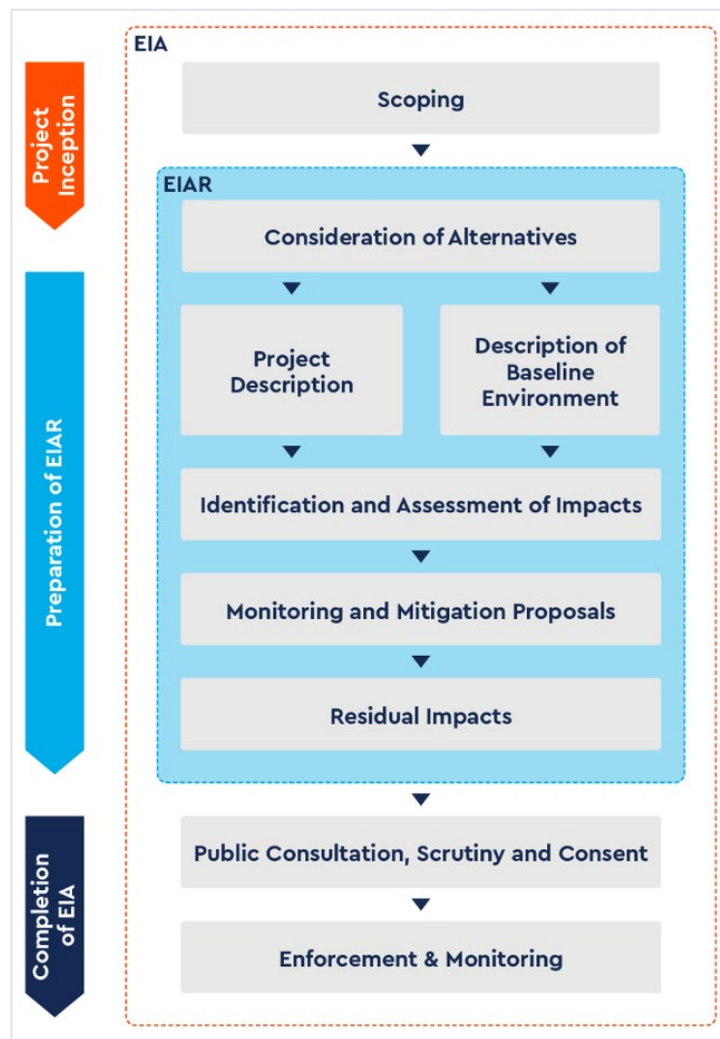


Diagram 2.1 The EIA Process

EIA 'Screening' is the stage where a decision is made as to whether a project's characteristics, location and impacts are such that it would have likely significant effects on the environment and therefore should be subject to the EIA process. This stage is undertaken for projects listed on Annex II of the EIA Directive. However, as noted above, Section 37 of the 2001 Act requires that "a report on the likely effects on the environment of the proposed railway works" (i.e. and EIA) shall accompany an application for an RO made to the Board. In terms of the EIA Directive, this is similar to a mandatory EIA for a project listed on Annex I of the EIA Directive. Due to this requirement of the 2001 Act, there is no requirement for EIA Screening, hence it has not been undertaken as part of the EIA process for the proposed Project.

2.4.1 Scoping

Scoping is the process of determining the content and extent of matters that should be covered by the EIA for submission to the Board. Scoping requires consideration of the nature and probable scale of potential environmental impacts which are likely to arise as a result of the proposed Project.

The MetroLink EIA Scoping Report (Jacobs 2018) is hereafter referred to as the EIA Scoping Report and can be reviewed in Appendix A2.1. This report was issued to statutory bodies and stakeholders during May and June 2019 with a cover letter inviting submissions from stakeholders in relation to potential environmental issues that they considered may result from the proposed Project and which would require consideration within the EIA. Full details in regard to statutory and non-statutory consultation are provided in Chapter 8 Consultation. In addition, each discipline chapter includes a response to issues raised of relevance to that topic. The EIA Scoping Report sets out the proposed

scope of work and methodologies to be applied in the development of the EIAR for the proposed Project. The key objectives of the EIAR Scoping Report were to:

- Provide a description of the proposed Project;
- Provide details of the environmental aspects being assessed and the general structure of the EIAR;
- Provide details on the assessment methodologies, proposed site visits and surveys, and the sources of desktop data that would inform the assessments;
- Identify likely significant effects which may arise during construction and operation of the proposed Project and which will be addressed in detail in the EIAR;
- Identify potential environmental effects which may be partially or wholly omitted from the EIAR (scoped out) and the reasons/rationale as to why that is; and
- Form a basis of common reference for consultation about the scope and methodology for the EIAR.

Although an EIAR Scoping Report was issued early in the assessment process and informed the initial development, content, methods and level of detail to be provided within the EIAR, it should be noted that scoping is considered a dynamic and iterative process that would be ongoing throughout the development of the EIAR for the proposed Project.

Details on all consultation undertaken for the project including the EIA Scoping Report is provided in Chapter 8 (Consultation). Chapter 8 (Consultation) also sets out how issues raised during the scoping consultation have been addressed in the EIA process.

2.4.2 Environmental Impact Assessment Report

The EIAR has been prepared in accordance with the guidance listed in Section 2.3. The EIAR reports the information required by Section 39 of the 2001 Act (as amended) and Article 5(1) of the EIA Directive, as set out in Table 2.1 of this chapter. Information on the methodology for the preparation of the EIAR is set out below in Section 2.5. This EIAR will be submitted alongside the application to the Board for an RO.

The methodology for the preparation of the EIAR to support the EIA process is described below in Section 2.5.

2.4.3 Public Consultation, Scrutiny and Consent

Chapter 8 (Consultation) addresses the outcome of consultations undertaken to date, including the consultation on the EIA Scoping, which informed the identification of the main impacts of the proposed Project and the methodology of assessment reported in this EIAR. As a part of the RO application process, a statutory consultation process will be undertaken, as set out in Section 40 of the Transport (Railway Infrastructure) Act 2001.

Scrutiny will include the examination by the Board of the information presented in the EIAR. The Board will initially consider the EIAR for completeness and quality. The Board will then undertake an examination of the EIAR and carry out its EIA. The assessment by the Board involves the identification, description and assessment of the direct and indirect effects of the proposed Project on environmental matters. The EIA process requires the Board to come of a reasoned conclusion on the significant effects of the proposed Project on the environment. Section 42B of the 2001 Act (as amended) sets out the considerations that the Board shall take account of when making its reasoned conclusion. The reasoned conclusion must take into account the results of its examination of the EIAR and, any supplementary information requested by the Board and provided by TII and any relevant information received through consultations, or otherwise available to the Board.

The 2001 Act and Article 8(a) of the EIA Directive specifies the information which must be included in the competent authority's response which includes the reasoned conclusions on the significant effects of the proposed Project on the environment, taking into account the examination and, where appropriate, its own supplementary examination.

2.4.4 Enforcement and Monitoring

Article 8a of the EIA Directive requires that:

1. 'The decision to grant development consent shall incorporate at least the following information ... (b) any environmental conditions attached to the decision, a description of any features of the project and/or measures envisaged to avoid, prevent or reduce and, if possible, offset significant adverse effects on the environment as well as, where appropriate, monitoring measures. ... 4 Member States shall ensure that the features of the project and/or measures envisaged to avoid, prevent or reduce and, if possible, offset significant adverse effects on the environment are implemented by the developer, and shall determine the procedures regarding the monitoring of significant adverse effects on the environment. The type of parameters to be monitored and the duration of the monitoring shall be proportionate to the nature, location and size of the project and the significance of its effects on the environment. Existing monitoring arrangements resulting from Union legislation other than this Directive and from national legislation may be used if appropriate, with a view to avoiding duplication of monitoring.'

These requirements are transposed in Irish law by Section 43(2A) of the Transport (Railway Infrastructure) Act 2001 in relation to the environmental conditions to be included in the RO and Section 43B to 43F in relation to the monitoring and enforcement of the environmental conditions.

It is anticipated that the environmental conditions of the RO will incorporate those mitigation and monitoring measures described in Chapter 31 (Summaries of the Route Wide Mitigation & Monitoring Proposed).

2.5 Methodology used in Preparation of the EIAR

2.5.1 EIAR Structure and Assessment Methodology

This EIAR has been prepared to allow the Board to undertake the EIA for the proposed Project and takes into account information compiled through the desk-based assessment, field surveys and consultation with the public, relevant stakeholders and certain bodies.

2.5.2 EIAR Format and Structure

This EIAR has followed the 'Grouped Format Structure' as laid out in the Guidelines on the Information to be contained in Environmental Impact Statements (EPA 2002). This means that the EIAR has been prepared in a format which examines each environmental topic in a separate chapter of the EIAR, with each chapter covering the baseline environment, predicted potential impacts, mitigation and monitoring measures and residual impacts for each particular environmental topic. This format facilitates ease of cross referencing between various environmental topics.

The EIAR also follows advice set out in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022) by presenting information in a rational and systematic manner, such that it is clear how the EIAR meets the mandatory requirements. The EIAR is presented in line with the outline structure provided in Table 2.2 and a description of the main components of the EIAR are detailed here. This EIAR has been split into five volumes as follows:

- **Volume 1 – Non-Technical Summary:** Presentation of the EIAR in a concise and engaging manner which allows the public and key stakeholders to understand the proposed Project and the key environmental issues associated with it.
- **Volume 2 – Introduction & Project Description:** This volume provides the project description, comprising information on the location, design and scale of the proposed Project and the physical characteristics of the proposed Project having regard to the Construction and Operational Phases. This section also includes a description of the reasonable alternatives considered and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

- **Volume 3 – Environmental Baseline & Assessment:** This volume provides an accurate and comprehensive description of the environmental baseline and assessment of the impacts of the proposed Project divided into separate chapters; one for each environmental factor. The assessment identifies and assesses the likely significant effects during the Construction and Operational Phases, provides a description of the mitigation measures and monitoring required to ensure that significant adverse environmental effects are minimised, and describes the residual post-mitigation effects.
- **Volume 4 – Figures:** This volume contains clear and consistent drawings as cross-referenced in each of the EIAR chapters.
- **Volume 5 – Appendices:** The appendices contain a collection of technical reference information supporting the EIAR chapters.

Table 2.2: EIAR Structure

Section	Description	Relevant Legislation	Prepared by
Volume 1 Non-Technical Summary			
Non-Technical Summary	Summary of the EIAR in non-technical language.	Article 5(1)(e) of the EIA Directive and section 39(1)(b)(vi)) of the Transport (Railway Infrastructure) Act, 2001 (as amended) require the inclusion of a Non-Technical Summary of the EIAR.	Jacobs Idom
Volume 2 Introduction and Project Description			
Chapter 1	Introduction to the proposed Project and purpose of report	n/a	Jacobs Idom
Chapter 2	Methodology in Preparation of the EIAR	n/a	Jacobs Idom
Chapter 3	Background to the MetroLink Project	n/a	Jacobs Idom
Chapter 4	Description of the MetroLink Project	As required under Article 5(1)(a) of the EIA Directive and section 39(1)(b)(i) and (2) of the 2001 Act (as amended), Chapter 4 provides a detailed description of the proposed Project including project size, design and location.	Jacobs Idom
Chapter 5	MetroLink Construction Phase	As required under Article 5(1)(a) and Annex IV point 1 of the EIA Directive and section 39(2) of the 2001 Act (as amended), Chapter 5 provides a description of the characteristics of the Construction Phase of the proposed Project.	Jacobs Idom
Chapter 6	MetroLink Operations & Maintenance	As required under Article 5(1)(a) and Annex IV point 1 of the EIA Directive and section 39 (2) of the 2001 Act (as amended), Chapter 6 provides a description of the characteristics of the Operational Phase of the proposed Project.	Jacobs Idom
Chapter 7	Consideration of Alternatives	As required under Article 5(1)(d) of the EIA Directive and section 39(1)(b)(v) of the 2001 Act (as amended), Chapter 7 provides a description of the reasonable alternatives studied by the developer, which are relevant to the proposed Project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed Project on the environment.	Jacobs Idom

Section	Description	Relevant Legislation	Prepared by
Chapter 8	Consultation	The consultation required by Article 4(5) and 5(2) of the EIA Directive will take place during the RO application process. Chapter 8 details the outcome of additional consultation, over and above the statutory requirements, carried out in advance of the submission of the application. It also includes the consultation responses provided during the EIA Scoping stage.	Jacobs Idom
Volume 3 Environmental Baseline and Assessment			
Chapter 9	Traffic & Transport	Annex IV point 4 of the EIA Directive requires a description of the factors specified in Article 3(1) likely to be significantly affected by the project. This includes 'material assets'. Table 3.1 of the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022) identifies 'Traffic' as a typical heading under which the environmental factor 'material assets' can be addressed in an EIAR. Chapter 9 provides an assessment of potentially significant traffic and transport effects in line with section 39(1)(b)(ii) – (iv) and 39 (2) of the 2001 Act (as amended),	Jacobs Idom
Chapter 10	Human Health	Chapter 10 covers the requirement for assessment on human health as required under Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended),	Corporate Health Ireland Ltd.
Chapter 11	Population & Land Use	Chapter 11 covers the requirement for assessment on potentially significant effects to population as required under Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended),	Future Analytics Consulting Ltd.
Chapter 12	Electromagnetic Compatibility & Stray Current	Chapter 12 covers the requirement to assess potentially significant effects from electromagnetic radiation as required under Annex IV, point 5(c) of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended). Additionally, this chapter will assess impacts on sensitive equipment.	Compliance Engineering Ireland Ltd.
Chapter 13	Airborne Noise & Vibration	Chapter 13 covers the requirement to assess potentially significant effects from airborne noise and vibration as required under Annex IV point 5(c) of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), Additionally, this chapter will assess potential effects on sensitive equipment and buildings.	AWN Consulting Ltd.
Chapter 14	Groundborne Noise & Vibration	Chapter 14 covers the requirement to assess potentially significant effects from groundborne noise and vibration as required under Annex IV point 5(c) of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), Additionally, this	Rupert Taylor Ltd.

Section	Description	Relevant Legislation	Prepared by
		chapter will assess potential effects on sensitive equipment and buildings.	
Chapter 15	Biodiversity	Chapter 15 covers the requirement Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), to assess potentially significant effects on biodiversity, having particular attention to species and habitats protected under the Habitats Directive (Directive 92/43/EEC) and the Birds Directive (Directive 2009/147/EC).	Scott Cawley Ltd.
Chapter 16	Air Quality	Chapter 16 covers the requirement under Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), to assess potentially significant effects to air quality in the surrounding environment.	AWN Consulting Ltd.
Chapter 17	Climate	Chapter 17 covers the requirement under Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and (39(2) of the 2001 Act (as amended), to assess potentially significant effects to climate including greenhouse gas emissions and climate change in the surrounding environment.	AWN Consulting Ltd.
Chapter 18	Hydrology	Chapter 18 covers the requirement under Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), to assess potentially significant effects to water quality. This chapter assesses potentially significant effects from pollution and discharges to surface water.	AWN Consulting Ltd.
Chapter 19	Hydrogeology	Chapter 19 covers the requirement under Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), to assess potentially significant effects to water. This chapter assesses potentially significant effects to the groundwater environment.	AWN Consulting Ltd.
Chapter 20	Soils & Geology	Chapter 20 covers the requirement under Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), to assess potentially significant effects to soils.	Jacobs Idom
Chapter 21	Land-take	Chapter 21 covers the requirement under Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), to assess potentially significant effects on land. This chapter assesses the effect of land-take requirements for the proposed Project.	Jacobs Idom
Chapter 22	Infrastructure & Utilities	Chapter 22 covers the requirement under Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), to assess potentially significant effects on material assets. This chapter identifies impacts to existing utilities	Jacobs Idom

Section	Description	Relevant Legislation	Prepared by
		and infrastructure from the development of the proposed Project.	
Chapter 23	Agronomy	The proposed Project transects a number of agricultural properties, therefore Chapter 23 covers the requirement under Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), to assess potentially significant effects on land with regard to agronomy.	Phillip Farrelly
Chapter 24	Materials & Waste Management	Annex IV point 1(d) of the EIA Directive requires estimates of quantities and types of waste produced during the Construction and Operational Phases. Annex IV point 5 (b) and (c) and section 39(2) of the 2001 Act (as amended) require a description of the likely significant effects of the project on the environment resulting from the use of natural resources and the disposal and recovery of waste. Chapter 24 presents an assessment of how materials and waste will be managed for the proposed Project.	Jacobs Idom
Chapter 25	Archaeology & Cultural Heritage	Chapter 25 covers the requirement under Annex IV point 4 and 5(d) of the EIA Directive and sections 39(1)(b)(ii) – (iv) and section 39(2) of the 2001 Act (as amended) to assess potentially significant effects on cultural heritage including archaeological heritage.	IAC Archaeology Ltd.
Chapter 26	Architectural Heritage	Chapter 26 covers the requirement under Annex IV point 4 of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), to assess potentially significant effects on architectural heritage.	Historic Building Consultants Ltd.
Chapter 27	Landscape & Visual	Chapter 27 covers the requirement under Annex IV point 5(d) of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), to assess potentially significant effects on the landscape. This chapter will assess any potential visual impacts to landscape caused by the proposed Project.	Mitchell & Associates
Chapter 28	Risk of Major Accidents & Disasters	Chapter 28 covers the requirement under Annex IV point 5(d) of the EIA Directive and sections 39(1)(b)(ii) – (iv) and 39(2) of the 2001 Act (as amended), include the expected effects deriving from the vulnerability of the proposed Project to risks of major accidents and/or disasters.	Jacobs Idom
Chapter 29	Interactions Between the Various Environmental Aspects	This chapter identifies, describes and assesses the interaction between all of the environmental aspects referred to in Volume 3 of this EIAR to assist the Board in that regard, in accordance with Article 3(1)(e) of the EIA Directive.	Jacobs Idom
Chapter 30	Cumulative Impacts of Interaction Between	As required under Annex IV point 5(e) of the EIA Directive and section 39(2) of the 2001 Act (as amended), Chapter 30 provides an	Jacobs Idom

Section	Description	Relevant Legislation	Prepared by
	Other Projects & MetroLink	assessment of the cumulation of effects with other existing and/or approved projects.	
Chapter 31	Summaries of the Route Wide Mitigation & Monitoring Proposed	Chapter 31 describes mitigation and monitoring for the proposed Project as required under Article 5(1)(c) and Annex IV point 7 of the EIA Directive and section 39(1)(b)(iv) of the 2001 Act (as amended) in order to avoid, prevent, reduce, or if possible, offset any identified significant adverse effects on the environment and, where appropriate, describes any proposed monitoring arrangements.	Jacobs Idom
Volume 4 Drawings and Figures			
Figures	Graphics and plans supporting the EIAR chapters, illustrating the proposed Project and environmental information. Figure reference numbers correspond to the relevant EIAR chapter (eg. Figure 7.1 relates to Chapter 7).	Section 37(3)(b) of the 2001 Act (as amended) requires 'a plan of the proposed railway works'.	Jacobs Idom with data input from relevant specialist.
Volume 5 Appendices			
Appendices	Technical reference information supporting the EIAR chapters, such as calculations and detailed background data (as required). Appendix numbers correspond to the relevant EIAR chapter (e.g. Appendix 7.1 relates to Chapter 7).	Section 39 (1)(b)(iii) of the 2001 Act (as amended) requires the EIAR to include the data required to identify and assess the main effects which the proposed railway works are likely to have on the environment. Article 5(1)(f) of the EIA Directive requires any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.	Jacobs Idom and relevant specialists.

As far as is practicable, the chapters are written in a non-technical style to make it accessible to a wider, non-specialist audience. Where technical terminology is used, an explanation is provided in the text, and/or in the glossary of terms, which is provided at the beginning of each topic chapter in the EIAR.

2.5.3 EIAR Discipline Chapters Structure

Each of the topic chapters in Volume 3 (Environmental Assessment) of this EIAR broadly follow the same structure which includes the following headings:

2.5.3.1 Introduction

This section of each chapter provides an overview of the aims and objectives of the chapter in assessing the proposed Project and outlines the scope of the assessment.

2.5.3.2 Methodology

Annex IV point 6 of the EIA Directive requires an EIAR to provide:

'A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.'

This section of each chapter outlines the methods used to describe the baseline environmental conditions and to predict the likely impacts on the environment of the proposed Project during both the Construction Phase and the Operational Phase. The data and survey requirements for each chapter vary depending on the environmental topic and have been chosen by the particular specialist based on relevant legislation, best practice guidance, policy requirements, and professional judgement. Similarly, the study area is also defined for each environmental topic based on best practice guidelines, professional judgement and experience.

All environmental topics require desk-based reviews of all relevant data at a minimum. These desk-based studies were then supplemented by field studies and consultation with relevant stakeholders, for example interested parties, statutory bodies and local authorities, as required for each environmental topic.

This section of each chapter describes the assessment criteria for each environmental topic. Each environmental topic has its own bespoke method for assessment, in accordance with published professional guidelines, details of which are provided within each topic Chapter. General methods for EIA also apply and the assessments have been conducted in accordance with the following EPA Guidance:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022); and
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA 2015).

In addition to the applicable EIA legislation and guidance, all EU Directives and national legislation relating to the specialist areas have been considered as part of the process.

The EPA Guidelines (EPA 2022) provide guidance on determining significance. This is reproduced in Table 2.3 and has formed the basis of all topic assessments in the EIAR.

Table 2.3: Reproduction of Description of Effects from the EPA Guidelines (EPA 2022) Assessment Criteria

Assessment Criteria	
Quality of Effects	
It is important to inform the non-specialist reader whether the effect is positive, negative or neutral.	Positive Effects A change which improves the quality of the environment (for example, by increasing species diversity or improving the reproductive capacity of an ecosystem; or removing nuisances; or improving amenities)
	Neutral Effects A change which does not affect the quality of the environment
	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 a nuisance)
Significance of Effects	
'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for the different topics the	Imperceptible An effect capable of measurement but without noticeable consequences
	Not significant An effect which causes noticeable changes in the character of the environment but without noticeable consequences
	Slight Effects

Assessment Criteria	
following definitions may be useful.	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 trends
	Significant Effects An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant Effects An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment
	Profound Effects An effect which obliterates sensitive characteristics
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
Probability of Effects	
Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the Board 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.
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

Assessment Criteria	
	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Types of Effects	
	<p>Indirect Effects (aka 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.</p> <p>Cumulative Effects The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.</p> <p>'Do-Nothing Effects' The environment as it would be in the future should the subject project not be carried out.</p> <p>'Worst case' Effects The effects arising from a project in the case where mitigation measures substantially fail.</p> <p>Indeterminable Effects When the full consequences of a change in the environment cannot be described.</p> <p>Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.</p> <p>Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.</p> <p>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).</p>

In addition to the use of these criteria, the most common method employed to determine significance of effects is to compare the magnitude of the predicted effect with the sensitivity of the receiving environment. This approach is outlined in Table 2.4. In this approach 'magnitude' and 'sensitivity' are used as descriptors of a wide range of different factors. 'Magnitude' includes the spatial extent of the effect; the time period over which the effect will occur; and whether the effect is permanent or reversible. Sensitivity describes the value or importance placed upon a 'receptor'. The matrix shown in Table 2.4 is based on the EPA Guidelines (EPA 2022) as a method of combining magnitude and sensitivity to achieve a decision on significance. The use of these approaches improves the transparency and robustness of the professional judgement employed.

Table 2.4: Significance of Impacts Matrix

Magnitude of Impact	Sensitivity of Receptor			
	Negligible	Low	Medium	High
High	Not significant- to Slight	Moderate	Very Significant	Profound
Medium	Not significant to Slight	Slight to Moderate	Significant	Significant to Very Significant
Low	Not significant	Slight	Slight to Moderate	Moderate to Significant
Negligible	Imperceptible	Not Significant	Not significant	Not significant

2.5.3.3 Baseline Environment

Each chapter in Volume 3 of this EIAR provides a description of the existing environmental conditions within each defined study area. Annex IV point 3 of the EIA Directive has a requirement to include the following in the EIAR:

'a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.'

This section in each chapter describes the findings of the desktop studies, field surveys and information gained through any consultations carried out and uses the information to provide a description of the current state of the environment and an outline of its likely evolution based on all information gathered.

2.5.3.4 Predicted Impacts

Section 39(1)(b)(ii) and (iii) require the EIAR to contain *'a description of the likely significant effects of the proposed railway works on the environment'* and *'the data required to identify and assess the main effects which the proposed railway works are likely to have on the environment'*. Section 39(2) also requires that the EIAR contains any additional information specified in Annex IV to the EIA Directive relevant to the specific characteristics of the particular railway works or type of railway works proposed and to the environmental features likely to be affected.

The main purpose of the EIAR is to identify, describe and evaluate the likely significant impacts of the proposed Project. The proposed Project has the potential to impact on the environment during both the Construction and Operational Phases. Each specialist reviewed the details of the proposed Project and, based on the baseline information collected, predicted the impacts that the proposed Project will potentially have on their specific environmental topic.

Under Annex IV, point 5 of the EIA Directive, the EIAR should include a description of likely significant effects of the project resulting from, inter alia:

- a) *'the construction and existence of the proposed development, including, where relevant, demolition works';*
- b) *'the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources';*
- c) *'the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste';*
- d) *'the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)';*
- e) *'the cumulation of effects with other existing or approved developments, or both, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources';*
- f) *'the impact of the proposed development on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the proposed development to climate change'; and*
- g) *'the technologies and the substances used'.*

And that:

'The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This

description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project.'

Each predicted impact has been fully described and assigned a significance and duration based on the assessment criteria as outlined within each chapter. A conservative approach has been taken to assessing likely impacts, with the 'worst-case scenario' used in order to ensure all foreseeable impacts have been identified. It should be noted that cumulative impacts are addressed specifically in Chapter 30.

2.5.3.5 Mitigation Measures

This section of each topic Chapter describes the mitigation measures which are required. Section 39(1)(b)(iv) of the 2001 Act requires the EIAR to contain *'a description of any features of the proposed railway works and of any measures envisaged to avoid, prevent or reduce and if possible offset likely significant adverse effects on the environment.'*

The requirement to describe mitigation measures is laid out in the EIA Directive. Article 5(1) of the 2011 Directive, as amended by the 2014 EIA Directive states that:

'...the developer shall include at least:

(c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment'.

Annex IV states that the description of the project must include:

'7. A description of the measures envisaged to avoid, prevent, reduce, or if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparing of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.'

As per Section 3.8.1 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022), there are four types of mitigation measure:

- **Mitigation by Avoidance** – generally part of the consideration of alternatives, where adverse effects are avoided entirely through changes in design.
- **Mitigation by Prevention** – generally technical measures taken to prevent a potential unacceptable significant effect. Measures are put in place to limit the source of the effect, e.g. through specification of process standards or building design. Prevention measures also include safeguards against the effects of accidental events.
- **Mitigation by Reduction** – commonly used to deal with effects which cannot be avoided. Does not tend to affect the source of the problems, but instead aims to limit their effect. These measures can be split into two types, namely reducing the effect through interception of the emission (e.g. wastewater treatment and noise attenuation); and reducing exposure to the effect by identifying the receptors to be impacted and installing protection or a barrier between the receptor and the source of the effect.
- **Mitigation by Remedy/Offsetting** – a strategy for dealing with negative effects which can be neither avoided nor reduced. Remedy involves compensation for, or counter-action of, an adverse effect (e.g. planting new vegetation to compensate for removal elsewhere as a result of the project). Offsetting involves carrying out further works to improve adverse conditions (e.g. installing tunnels to allow wildlife to retain access to comparable habitats).

A significant proportion of mitigation is already incorporated into the design of the proposed Project through mitigation by prevention. Where an impact to the environment has been deemed as unacceptable, mitigation has been embedded in the design, or the unacceptable option has been ruled out. Refer to Chapter 7 Consideration of Alternatives for further details on how the consideration of environmental impacts has influenced the project development.

Mitigation measures have been proposed for all impacts resulting in a moderate significance or above. Furthermore, mitigation measures have also been proposed for some impacts with a lower significance where such measures are routinely applied (for example in the management of construction-related impacts) or where, based on professional judgement, there would be a material benefit to the receptor.

2.5.3.6 Residual Impacts

Any effects that remain after all assessment and mitigation are referred to as 'Residual Effects'. Each topic Chapter in Volume 3 of this EIAR includes a section describing significant residual impacts that will continue to exist after mitigation has been implemented. These are the proposed Project's remaining environmental effects that could not be reasonably avoided.

2.5.3.7 Cumulative Impacts and Impact Interrelations

Annex IV of the EIA Directive includes the following at point 5(e):

'A description of the likely significant effects of the project on the environment resulting from, inter alia: ... (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources'.

The potential for significant cumulative impacts and impact interrelations is described in each environmental topic chapter in Volume 3. Chapter 29 (Interactions Between the Various Environmental Aspects) outlines all anticipated interactions between the environmental topics on a project level, while Chapter 30 (Cumulative Impacts of Interactions Between Other Projects & MetroLink) explores all planned projects in the vicinity of the proposed Project and examines all likely cumulative impacts.

2.5.3.8 Difficulties Encountered in Compiling Information and Main Uncertainties Involved

This section draws attention to limitations about factors that may affect the reliability of baseline data. These include the availability, completeness, accuracy, age and accessibility of data.

Annex IV, point 6 of the EIA Directive requires *'details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved'*. Each topic chapter in Volume 3 includes a section outlining any difficulties encountered in compiling that chapter.

2.5.3.9 List of References

Each chapter provides a list of references used to inform the methodology, baseline and assessment.

2.6 EIAR Contributors

TII is the applicant for the RO. In January 2018, a Jacobs Idom Consortium was appointed by TII to develop a preliminary design for the proposed Project, to prepare an EIAR, to prepare a report to support an Appropriate Assessment Screening, to prepare a Natura Impact Statement and prepare all required materials for the submission of an RO Application under Section 37 of the 2001 Act.

The EIAR has been prepared by Jacobs Idom, with inputs from competent experts under a number of environmental disciplines as outlined in Table 2.2. A list of the competent experts can be found in Appendix A2.2.

2.7 Glossary

Term	Meaning
Screening	The process by which a decision is taken on whether or not EIA is required for a particular Project.
Scoping	The process of identifying the content and extent of the Environmental Information to be submitted to the Competent Authority under the EIA procedure

2.8 References

Department of Housing, Local Government and Heritage (2018). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. Government of Ireland.

Environmental Protection Agency (EPA) (2002). Guidelines on the information to be contained in Environmental Impact Statements.

Environmental Protection Agency (EPA) (2003). Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.

Environmental Protection Agency (EPA) (2015). Draft Advice Notes for Preparing Environmental Impact Statements.

Environmental Protection Agency (EPA) (2017). Draft Revised Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

European Commission (1999). Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.

European Union (2013). Guidance of Integrating Climate Change and Biodiversity into Environmental Impact Assessment.

European Union (2017a). Environmental Assessments of Plans, Programmes and Projects – Rulings of the Court of Justice of the European Union.

European Union (2017b). Environmental Impact Assessment of Projects – Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU).

European Union (2017c). Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report.

Jacobs (2018). MetroLink EIAR Scoping Report.

2.8.1 Directives

Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (EIA Directive)

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (amendment EIA Directive)

Directive 2012/18/EU of the European Parliament and the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances

Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations (as amended)

Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (as amended) (Birds Directive)

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as amended) (Habitats Directive)

2.8.2 Acts and Regulations

European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021 - S.I. No. 743/2021

Planning and Development Regulations 2001 (as amended) – S.I. No. 600 of 2001 (as amended)

Transport (Railway Infrastructure) Act 2001 (as amended) – No. 55 of 2001 (as amended)