



Environmental Impact Assessment Report (EIAR)

Strategic Housing
Development -
Knocknacarra District
Centre, Gort na Bró,
Rahoon, Galway

Volume 1: Non-Technical Summary, Environmental
Impact Assessment Report





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Table of Contents

	TABLE OF CONTENTS.....	i
	TABLE OF TABLES.....	xi
	TABLE OF FIGURES.....	xii
	TABLE OF PLATES.....	xiii
	NON-TECHNICAL SUMMARY.....	xiv
1.	INTRODUCTION.....	1-1
1.1	Introduction.....	1-1
1.2	The Applicant.....	1-1
1.3	Legislative Context.....	1-2
1.4	EIA Screening.....	1-2
1.4.1	EIAR Guidance.....	1-3
1.5	Brief Description of the Development.....	1-4
1.6	Need for the Development.....	1-4
1.7	Purpose and Scope of the EIAR.....	1-4
1.8	Structure and Content of the EIAR.....	1-5
1.8.1	General Structure.....	1-5
1.8.2	Description of Likely Significant Effects and Impacts.....	1-6
1.9	Project Team.....	1-9
1.9.1	Project Team Members.....	1-10
1.9.1.1	MKO Team.....	1-10
1.9.1.2	AWN Consulting Ltd.....	1-12
1.9.1.3	Atkins – Traffic.....	1-12
1.9.1.4	Tobar Archaeological Services.....	1-13
1.10	Preparation.....	1-13
2.	BACKGROUND TO THE PROPOSED DEVELOPMENT.....	2-1
2.1	Site of the Proposed Development.....	2-1
2.1.1	Site Location.....	2-1
2.1.2	Physical Characteristics of Site and Surrounding Lands.....	2-1
2.1.3	Site Access.....	2-3
2.1.4	Background to the Proposed Development.....	2-3
2.2	Planning History.....	2-4
2.2.1	Planning Applications within the Application Boundary.....	2-4
2.2.2	Planning Applications within the Vicinity of the Application Site.....	2-5
2.3	Strategic Planning Context.....	2-21
2.3.1	National Planning Policy.....	2-21
2.3.1.1	National Planning Framework.....	2-21
2.3.1.2	Planning Policy Statement 2015.....	2-21
2.3.1.3	Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas.....	2-21
2.3.1.4	Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities.....	2-22
2.3.1.5	Urban Development and Building Heights Guidelines for Planning Authorities December 2018.....	2-22
2.3.1.6	Design Manual for Urban Roads and Streets.....	2-22
2.3.1.7	Childcare Facilities Guidelines for Planning Authorities.....	2-23
2.3.2	Regional Planning Policy.....	2-23
2.3.2.1	Regional Planning Guidelines for the West 2010 – 2022.....	2-23
2.3.2.2	Draft Regional Spatial & Economic Strategy for the Northern & Western Regional Assembly.....	2-23

2.3.3	Local Planning Policy	2-24
2.3.3.1	Galway City Development Plan 2017-2023	2-24
2.3.3.2	Galway Transportation and Planning Study	2-25
2.4	Alternatives.....	2-26
2.4.1	Introduction.....	2-26
2.4.2	Alternative Sites	2-26
2.4.3	Alternative Layouts.....	2-26
2.4.3.1	Alternative Option 1 – Presented to GCC at Section 247 Meeting [21 st November 2018].....	2-27
2.4.3.2	Alternative Option 2 – Presented to GCC at Section 247 Meeting [20 th February 2019]	2-27
2.4.3.3	Alternative Option 3 – Presented to ABP & GCC at the Tri-Partite Meeting [18 th July 2019].....	2-28
2.4.3.4	Current Scheme.....	2-28
2.4.4	Alternation Design Considerations.....	2-29
2.4.5	Alternative Land Uses	2-29
2.4.6	Alternative Processes	2-29
2.4.7	Alternative Mitigation.....	2-29
2.4.8	“Do Nothing” Alternative	2-29
2.5	Scoping and Consultation	2-30
2.5.1	Scoping Document.....	2-30
2.5.2	Scoping Responses	2-30
2.5.2.1	Department of Culture, Heritage and the Gaeltacht	2-31
2.5.2.2	Geological Survey of Ireland	2-31
2.5.2.3	Galway City Council – Heritage Officer	2-32
2.5.2.4	Transport Infrastructure Ireland.....	2-32
2.5.2.5	ESB Networks.....	2-33
2.5.3	Pre-Planning Meetings	2-33
2.5.3.1	Tripartite Meeting with GCC and An Bord Pleanála – 18 th July 2019.....	2-33
2.5.3.2	Section 247 Pre-Planning Meeting	2-33
2.5.3.3	Meeting with GCC Housing Section	2-33
2.6	Cumulative Impact Assessment	2-34
2.6.1	Methodology for the Cumulative Assessment of Projects.....	2-34
2.6.2	Projects Considered in Cumulative Assessment.....	2-34
3.	DESCRIPTION.....	3-1
3.1	Introduction	3-1
3.2	Existing Site Description.....	3-1
3.2.1	Site Location & Layout.....	3-1
3.2.2	Site Access	3-2
3.2.2.1	Pedestrian and Cyclist Access	3-4
3.3	Proposed Development Construction Operations	3-4
3.3.1	Hoarding	3-4
3.3.2	Pedestrian and Cyclist Safety.....	3-4
3.3.3	Proposed Hours in which Vehicles will Arrive and Depart	3-5
3.3.4	Access Arrangements for Vehicles.....	3-5
3.3.5	Exclusion Zones on Site.....	3-7
3.3.6	Size of Vehicles	3-7
3.3.7	Parking and Loading Arrangements.....	3-7
3.3.8	Site Compound and Facilities.....	3-7
3.3.9	Phasing.....	3-7
3.4	Construction Methodologies	3-8
3.4.1	General Construction Measures	3-8
3.4.2	Soil Stripping & Temporary Stockpiling.....	3-8
3.4.3	Temporary Site Compound	3-9
3.4.4	Road Realignment	3-9
3.4.5	Excavation and Services Installation	3-9
3.4.5.1	Existing Underground Services.....	3-10
3.4.6	Building Construction.....	3-10
3.4.7	Construction Site Management Incorporated into Project Design.....	3-11
3.4.7.1	Prevention Pollution Control Measures.....	3-11
3.4.8	Landscaping works	3-12
3.4.9	Invasive Species	3-12
3.4.9.1	Control Measures for the Management of Invasive Species	3-12
3.5	Other Site Details.....	3-13

3.5.1	Waste Management.....	3-13
3.5.2	Dust.....	3-14
3.5.3	Noise and Vibration.....	3-15
3.5.4	Road Cleaning and Wheel Washing.....	3-16
3.5.5	Water Supply.....	3-16
3.5.6	Wastewater Management.....	3-16
3.5.7	Aggregates.....	3-16
3.5.8	Construction Traffic/Plant.....	3-16
3.6	Operational Phase.....	3-17
3.6.1	Drainage Arrangement.....	3-17
3.6.1.1	Surface Water Drainage.....	3-17
3.6.1.2	Foul Water Infrastructure.....	3-18
3.6.2	Water Supply.....	3-18
3.6.3	Energy Use.....	3-18
3.7	Decommissioning Phase.....	3-19
4.	POPULATION AND HUMAN HEALTH.....	4-3
4.1	Introduction.....	4-3
4.2	Statement of Authority.....	4-3
4.3	Methodology.....	4-3
4.4	Receiving Environment.....	4-4
4.4.1	General Site Description.....	4-4
4.4.2	Settlement and Land-use.....	4-4
4.4.3	Population.....	4-5
4.4.3.1	Population Trends.....	4-5
4.4.3.2	Population Density.....	4-5
4.4.3.3	Household Statistics.....	4-7
4.4.3.4	Age Structure.....	4-7
4.4.4	Employment and Economic Activity.....	4-8
4.4.4.1	Employment by Socio-Economic Group.....	4-8
4.4.5	Land-use.....	4-9
4.4.6	Tourism.....	4-10
4.4.6.1	Tourist Numbers and Revenue.....	4-10
4.4.6.2	Tourist Attractions.....	4-10
4.4.7	Local Amenities.....	4-11
4.4.7.1	Education.....	4-11
4.4.7.2	Access and Public Transport.....	4-11
4.4.7.3	Amenities and Community Facilities.....	4-11
4.5	Human Health.....	4-12
4.6	Social and Economic Assessment.....	4-12
4.6.1	Market Demand for the Proposed Development.....	4-12
4.7	Likely and Significant Impacts and Associated Mitigation Measures.....	4-13
4.7.1	Do-Nothing Effects.....	4-13
4.7.2	Construction Phase.....	4-13
4.7.2.1	Health and Safety.....	4-13
4.7.2.2	Employment and Investment.....	4-14
4.7.2.3	Population.....	4-14
4.7.2.4	Tourism.....	4-14
4.7.2.5	Land-use.....	4-14
4.7.2.6	Economic Activity.....	4-15
4.7.2.7	Noise.....	4-15
4.7.2.8	Dust and Air Quality.....	4-16
4.7.2.9	Traffic.....	4-17
4.7.3	Operational Phase.....	4-17
4.7.3.1	Health and Safety.....	4-17
4.7.3.2	Employment and Investment.....	4-18
4.7.3.3	Population.....	4-18
4.7.3.4	Tourism.....	4-18
4.7.3.5	Land-use.....	4-18
4.7.3.6	Noise.....	4-19
4.7.3.7	Dust and Air Quality.....	4-19
4.7.3.8	Traffic.....	4-20
4.7.3.9	Vulnerability of the Project to Natural Disaster.....	4-20
4.7.4	Cumulative Effect.....	4-21

4.7.4.1	Health and Safety.....	4-21
4.7.4.2	Dust and Noise.....	4-21
4.7.4.3	Traffic	4-21
4.7.4.4	Employment and Investment.....	4-21
4.7.4.5	Population	4-22
4.7.4.6	Land-use.....	4-22
4.7.4.7	Tourism and Amenity.....	4-22
5.	BIODIVERSITY	5-1
5.1	INTRODUCTION	5-1
5.1.1	Background	5-1
5.1.2	Relevant Legislation and Policy.....	5-1
5.1.2.1	National Legislation.....	5-1
5.1.2.2	National Policy.....	5-1
5.1.2.3	European Legislation	5-2
5.1.3	Scoping/Review of Relevant Guidance and Sources of Consultation	5-2
5.1.4	Statement of Authority.....	5-3
5.2	ASSESSMENT METHODOLOGY	5-4
5.2.1	Establishing the Zone of Influence	5-4
5.2.2	Desk Study	5-4
5.2.3	Multidisciplinary Ecological Walkover Survey	5-5
5.2.4	Methodology for Assessment of Effects.....	5-5
5.2.4.1	Geographical framework.....	5-5
5.2.4.2	Characterising Ecological Impacts and Effects	5-6
5.2.4.3	Significance of Effect.....	5-7
5.2.5	Incorporation of Mitigation.....	5-9
5.3	ESTABLISHING THE ECOLOGICAL BASELINE	5-10
5.3.1	Desk Study	5-10
5.3.1.1	Designated Sites	5-10
5.3.1.2	Vascular plants	5-15
5.3.1.3	Habitats	5-16
5.3.1.4	Birds	5-16
5.3.1.5	National Biodiversity Data Centre (NBDC) Records.....	5-19
5.3.1.6	Bat Records.....	5-20
5.3.1.7	Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>).....	5-21
5.3.1.8	Invasive Species	5-21
5.3.1.9	NPWS Records.....	5-21
5.3.1.10	Water Quality	5-23
5.3.1.11	N6 Galway City Transport Project (GCTP) Ecology Surveys.....	5-23
5.3.1.12	Conclusions of the Desktop Study	5-23
5.3.2	Ecological Walkover Survey Results.....	5-24
5.3.2.1	Description of Habitats and Flora within the Study Area.....	5-24
5.3.2.2	Fauna in the receiving environment.....	5-32
5.4	ECOLOGICAL IMPACT ASSESSMENT	5-34
5.4.1	Do Nothing Effect	5-34
5.4.2	Impacts During Construction Phase.....	5-34
5.4.2.1	Floral Habitat Loss.....	5-34
5.4.2.2	Disturbance/Disruption to Fauna	5-35
5.4.3	Impacts During the Operational Phase	5-37
5.4.3.1	Change of habitat use.....	5-37
5.4.3.2	Disturbance to Faunal Species.....	5-37
5.4.3.3	Impacts on water quality during operational phase.....	5-38
5.4.4	Impacts on Designated Sites	5-40
5.4.4.1	Impacts on National/European Sites.....	5-40
5.4.5	Cumulative impact.....	5-40
5.4.5.1	Plans	5-41
5.4.5.2	Other projects considered in the wider area.....	5-46
5.4.5.3	Conclusion of in-combination impact assessment.....	5-48
5.5	CONCLUSION	5-49
6.	GEOLOGY AND SOILS	6-1
6.1	Introduction	6-1
6.1.1	Background & Objectives	6-1
6.1.2	Statement of Authority.....	6-1
6.1.3	Relevant Legislation.....	6-1

6.1.4	Relevant Guidance	6-2
6.2	Methodology	6-2
6.2.1	Desk Study	6-2
6.2.2	Site Investigations.....	6-2
6.2.3	Impact Assessment Methodology.....	6-3
6.3	Receiving Environment	6-5
6.3.1	Site Description & Topography.....	6-5
6.3.2	Soils and Subsoils.....	6-6
6.3.3	Bedrock Geology	6-6
6.3.4	Geological Heritage and Designated Sites.....	6-9
6.3.5	Soil Contamination	6-9
6.3.6	Economic Geology.....	6-9
6.4	Characteristics of the Proposed Development	6-9
6.5	Potential Impacts of the Proposed Development.....	6-10
6.5.1	Do Nothing Scenario	6-10
6.5.2	Likely impacts and Mitigation Measures – Construction Stage	6-10
6.5.2.1	Subsoil Excavation and Bedrock Excavation.....	6-10
6.5.2.2	Contamination of Soil by Leakages and Spillages and Alteration of Soil Geochemistry	6-11
6.5.2.3	Assessment of Health Effects.....	6-12
6.5.3	Likely Impacts and Mitigation Measures – Operational Stage.....	6-12
6.5.4	Conclusion.....	6-12
7.	HYDROLOGY AND HYDROGEOLOGY	7-1
7.1	Introduction	7-1
7.1.1	Background & Objectives	7-1
7.1.2	Statement of Authority.....	7-1
7.1.3	Relevant Legislation.....	7-2
7.1.4	Relevant Guidance	7-3
7.2	Methodology	7-3
7.2.1	Desk Study	7-3
7.2.2	Site Investigations.....	7-4
7.2.3	Impact Assessment Methodology.....	7-4
7.3	Receiving Environment	7-4
7.3.1	Site Description & Topography.....	7-5
7.3.2	Water Balance.....	7-5
7.3.3	Regional & Local Hydrology.....	7-6
7.3.4	Site Drainage.....	7-6
7.3.5	Flood Risk Identification	7-6
7.3.6	Surface Water Hydrochemistry	7-7
7.3.7	Hydrogeology	7-10
7.3.8	Groundwater Vulnerability.....	7-12
7.3.9	Groundwater Hydrochemistry.....	7-12
7.3.10	Water Framework Directive Water Body Status & Objectives	7-12
7.3.11	Groundwater Body Status	7-12
7.3.12	Designated Sites & Habitats.....	7-14
7.3.13	Water Resources.....	7-14
7.3.14	Receptor Sensitivity	7-14
7.3.15	Proposed Site infrastructure and Drainage Management.....	7-15
7.4	Potential Impacts and Mitigation Measures.....	7-15
7.4.1	Overview of Impact Assessment Process	7-15
7.4.2	Construction Phase Potential Impacts	7-17
7.4.2.1	Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Waters.....	7-17
7.4.2.2	Potential Surface Water Quality Impacts from Shallow Excavation Dewatering	7-19
7.4.2.3	Potential Release of Hydrocarbons during Construction Stage	7-20
7.4.2.4	Groundwater and Surface Water Contamination from Wastewater Disposal.....	7-20
7.4.2.5	Release of Cement-Based Products.....	7-21
7.4.2.6	Potential Impacts on Hydrologically Connected Designated Sites.....	7-22
7.4.3	Operational Phase Impacts	7-23
7.4.3.1	Potential Increased Downstream Flood Risk due to Increased Hardstanding Area.....	7-23
7.4.3.2	Potential Downstream Water Quality Impacts from Surface Water Drainage.....	7-24
7.4.3.3	Potential Water Quality Impacts from Foul Drainage.....	7-25
7.4.4	Assessment of Potential Health Effects	7-26

7.4.5	Do Nothing Scenario	7-26
7.4.6	Cumulative Impacts.....	7-26
7.4.7	Conclusion.....	7-26
8.	AIR & CLIMATE.....	8-1
8.1	Introduction	8-1
8.1.1	Statement of Authority.....	8-1
8.2	Air	8-1
8.2.1	Background	8-1
8.2.2	Air Quality Standards	8-1
8.2.2.1	Air Quality and Health.....	8-4
8.2.3	Air Quality Zones	8-4
8.2.4	Existing Air Quality	8-5
8.2.4.1	Sulphur Dioxide (SO ₂).....	8-5
8.2.4.2	Particulate Matter (PM ₁₀).....	8-5
8.2.4.3	Nitrogen Dioxide (NO ₂).....	8-6
8.2.4.4	Carbon Monoxide (CO).....	8-6
8.2.4.5	Ozone (O ₃).....	8-7
8.3	Air Quality.....	8-8
8.3.1	Potential Air Quality Impacts and Associated Mitigation Measures	8-8
8.3.2	“Do-Nothing” Scenario.....	8-8
8.3.2.1	Construction Phase.....	8-8
8.3.2.2	Air Quality	8-9
8.3.3	Operational Phase	8-9
8.3.4	Health Effects.....	8-9
8.3.5	Cumulative Effect	8-10
8.3.5.1	General Air Quality.....	8-10
8.3.5.2	Dust Emissions	8-10
8.4	Climate.....	8-10
8.4.1	Climate Change and Greenhouse Gases.....	8-10
8.4.1.1	Greenhouse Gas Emission Targets.....	8-10
8.4.2	Climate and Weather in the Existing Environment	8-12
8.4.2.1	Wind	8-13
8.4.2.2	Rainfall.....	8-13
8.4.3	Potential Climate Impacts and Associated Mitigation Measures	8-16
8.4.3.1	‘Do-Nothing’ Effect	8-16
8.4.3.2	Construction Phase Impacts.....	8-16
8.4.3.3	Operational Phase Impacts.....	8-16
8.4.3.4	Cumulative Impacts.....	8-16
8.4.3.5	Human Health Effects.....	8-16
8.4.3.6	Mitigation Measures.....	8-16
8.4.3.7	Residual Effect	8-17
8.4.3.8	Significance of Effects.....	8-17
9.	NOISE & VIBRATION.....	9-1
9.1	Introduction and Methodology	9-1
9.2	Guidance & criteria	9-2
9.2.1	Operational Noise Guidance (Outward & Inward Impacts).....	9-2
9.2.2	Construction Noise Guidance (BS 5228).....	9-6
9.2.3	Vibration Guidance.....	9-7
9.3	Baseline Environment	9-9
9.3.1	Location & Land Use	9-9
9.3.2	Receptors	9-9
9.3.3	Ambient noise survey.....	9-10
9.3.4	Characteristics of the proposed development.....	9-15
9.4	Potential Impact of the Proposed Development.....	9-15
9.4.1	Construction Phase - Noise	9-15
9.4.1.1	Construction Traffic.....	9-18
9.4.2	Construction Phase – Vibration.....	9-18
9.4.3	Operational Phase – Noise.....	9-18
9.4.3.1	Additional Vehicular Traffic on Surrounding Roads	9-19
9.4.3.2	Building Services Plant	9-19
9.5	Potential cumulative impacts	9-20

9.6	'Do Nothing' Impact.....	9-21
9.7	Avoidance, Remedial & Mitigation Measures.....	9-21
9.7.1	Construction Phase.....	9-21
9.7.2	Operational Phase.....	9-22
9.7.2.1	Additional Traffic on Adjacent Roads.....	9-22
9.7.2.2	Building Services Plant.....	9-22
9.8	Predicted Impacts of the Proposed Development.....	9-23
9.8.1	Construction Phase.....	9-23
9.8.2	Operational Phase.....	9-23
9.9	Monitoring.....	9-24
9.9.1	Construction Phase.....	9-24
9.9.2	Operational Phase.....	9-24
9.10	Reinstatement.....	9-24
9.11	Interactions.....	9-24
9.12	Difficulties Encountered in Compiling.....	9-24
9.13	Inward Noise Impact.....	9-24
9.13.1	Existing Noise Climate.....	9-24
9.13.2	Noise Model of Site.....	9-25
9.13.3	Calibration of Noise Model.....	9-25
9.13.4	ProPG (2017).....	9-27
9.13.5	Façade Levels.....	9-34
10.	LANDSCAPE AND VISUAL.....	10-1
10.1	Introduction.....	10-1
10.1.1	Statement of Authority.....	10-1
10.1.2	Do-Nothing' Scenario Impact Assessment.....	10-1
10.1.3	Proposed Development Description.....	10-1
10.1.4	Scoping Replies/Pre-Planning Meetings.....	10-2
10.2	Methodology and Assessment Criteria.....	10-2
10.2.1	Guidance/Reference Documents.....	10-2
10.2.2	Baseline Landscape Assessment.....	10-3
10.2.3	Scope and Definition of Landscape and Visual Impact (LVIA) Study Area.....	10-3
10.2.4	Assessing Landscape Effects.....	10-3
10.2.5	Assessing Visual Effects.....	10-5
10.2.5.1	Viewpoint Selection.....	10-5
10.2.6	Photomontage Production.....	10-5
10.2.7	Visual Receptors – Assessing Magnitude and Sensitivity.....	10-6
10.2.8	Viewpoint Assessment.....	10-7
10.3	Landscape Baseline: Policy Context.....	10-8
10.3.1	Galway City Council Development Plan 2017-2023.....	10-8
10.3.1.1	Landscape Zoning and Designations.....	10-8
10.3.1.2	Green Network.....	10-9
10.3.1.3	Protected Views.....	10-10
10.3.1.4	Walking Routes and Cycleways.....	10-11
10.4	Landscape Baseline: Landscape Character.....	10-11
10.4.1	Site of the Proposed Development.....	10-11
10.4.2	Physical Landscape.....	10-11
10.4.2.1	Landform.....	10-11
10.4.2.2	Landcover.....	10-13
10.4.2.3	Land Use.....	10-17
10.5	Indications of Landscape Value.....	10-18
10.5.1	Landscape Value.....	10-18
10.6	Visual Baseline.....	10-19
10.6.1	Views Towards the Site.....	10-19
10.6.2	Viewpoint Locations and Descriptions.....	10-20
10.6.2.1	Viewpoint 1.....	10-23
10.6.2.2	Viewpoint 2.....	10-25
10.6.2.3	Viewpoint 3.....	10-27
10.6.2.4	Viewpoint 4.....	10-29
10.6.2.5	Viewpoint 5.....	10-31
10.6.2.6	Viewpoint 6.....	10-33
10.6.2.7	Viewpoint 7.....	10-35

10.6.2.8	Viewpoint 8	10-37
10.6.2.9	Viewpoint 9A	10-39
10.6.2.10	Viewpoint 9B	10-41
10.6.2.11	Viewpoint 10	10-43
10.7	Likely and Significant Impacts and Associated Mitigation Measures	10-44
10.7.1	‘Do-Nothing’ Scenario	10-44
10.7.2	Construction Phase Impact	10-44
10.7.2.1	Predicted Impacts on Landscape - Short Term Slight Negative Impact	10-44
10.7.2.2	Predicted Visual Impacts– Short Term Slight to Moderate Negative Impact	10-44
10.7.3	Operational Phase Impacts	10-45
10.7.3.1	Predicted Impacts on Landscape - Permanent, Moderate, Neutral to Negative Impact ...	10-45
10.7.3.2	Predicted Visual Impacts– Permanent, Slight to Moderate, Neutral Impact.....	10-45
10.7.4	Cumulative Impacts.....	10-46
10.7.5	Landscape Plan	10-46
10.7.6	Residual Impacts	10-46
10.7.6.1	Predicted Impacts on Landscape – Permanent, Neutral and Not Significant to Moderate Impact.....	10-46
10.7.6.2	Predicted Visual Impacts - Permanent Negative and Not Significant to Moderate Impact.....	10-46
11.	ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE.....	11-1
11.1	Introduction	11-1
11.1.1	Background and Objectives.....	11-1
11.1.2	Statement of Authority.....	11-1
11.1.3	Policy Context.....	11-2
11.1.3.1	Current Legislation.....	11-2
11.1.3.2	Policies of the Galway City Development Plan 2017-23.....	11-2
11.2	Methodology	11-3
11.2.1	Desktop Assessment.....	11-3
11.2.1.1	Record of Monuments and Places	11-4
11.2.1.2	Cartographic Sources and Aerial Photography	11-4
11.2.1.3	Topographic Files – National Museum of Ireland.....	11-4
11.2.1.4	Excavations Database.....	11-4
11.2.1.5	National Inventory of Architectural Heritage	11-4
11.2.1.6	Record of Protected Structures.....	11-5
11.2.2	Geographic Information Systems	11-5
11.2.3	Field Inspections.....	11-5
11.2.4	Impact Assessment Methodology.....	11-5
11.3	Receiving Environment	11-5
11.3.1	Description of Study Area.....	11-5
11.3.2	Archaeological Heritage.....	11-6
11.3.2.1	National Monuments.....	11-6
11.3.2.2	Recorded Monuments	11-6
11.3.2.3	Excavations Database.....	11-9
11.3.2.4	Topographical Files of the National Museum of Ireland.....	11-10
11.3.3	Architectural Heritage.....	11-10
11.3.3.1	Cartographic Record.....	11-10
11.3.3.2	Protected Structures.....	11-13
11.3.3.3	NIAH Structures and Garden Survey	11-16
11.4	Likely and Significant Impacts and Associated Mitigation Measures	11-19
11.4.1	Do-Nothing Effects	11-19
11.4.2	Construction Phase	11-19
11.4.2.1	Direct Impacts.....	11-19
11.4.3	Operational Phase	11-20
11.4.3.1	Indirect (Visual) Impacts.....	11-20
11.4.4	Cumulative Impacts.....	11-20
11.4.5	Mitigation	11-21
11.4.6	Residual Impacts	11-21
11.4.7	Significance of Effects	11-21
11.5	Conclusion	11-21
12.	MATERIAL ASSETS.....	12-1
12.1	Traffic and Transport.....	12-1
12.1.1	Introduction.....	12-1

12.1.1.1	Purpose of Section.....	12-1
12.1.1.2	Statement of Authority.....	12-1
12.1.2	Receiving Environment	12-1
12.1.2.1	Location and network summary	12-1
12.1.3	Scoping.....	12-3
12.1.4	Road Safety Audit.....	12-3
12.1.5	Mobility Management Plan.....	12-3
12.1.6	Proposed Development	12-3
12.1.6.1	Trip generation of Proposed Development.....	12-3
12.1.7	Existing Traffic Flows and Traffic Impact of Proposed Development.....	12-5
12.1.8	Likely and Significant Effects and Associated Mitigation Measures	12-6
12.1.8.1	Construction Phase	12-6
12.1.8.2	Operational Phase	12-8
12.1.8.3	Cumulative Assessment	12-11
12.2	Water and Other Services.....	12-11
12.2.1	Statement of Authority.....	12-11
12.2.2	Consultation	12-12
12.2.3	Construction Methodology	12-12
12.2.4	Receiving Environment	12-12
12.2.4.1	Electricity Network	12-12
12.2.4.2	Telecommunications Networks.....	12-12
12.2.4.3	Gas Distribution Networks.....	12-13
12.2.4.4	Water Supply Networks	12-13
12.2.4.5	Sewage Networks	12-13
12.2.4.6	Waste Management.....	12-14
12.2.5	Likely and Significant Impacts and Associated Mitigation Measures.....	12-14
12.2.5.1	Do-Nothing Impact.....	12-14
12.2.5.2	Construction Phase	12-14
12.2.5.3	Operational Phase	12-15
12.2.5.4	Decommissioning Phase	12-15
12.2.5.5	Cumulative Effects.....	12-15
12.3	Summary & Conclusions.....	12-15
12.3.1	Summary	12-15
12.3.2	Conclusion.....	12-16
13.	INTERACTIONS.....	13-1
13.1	Introduction	13-1
13.2	Impact Interactions	13-2
13.2.1	Population and Human Health.....	13-3
13.2.2	Biodiversity	13-3
13.2.3	Land, Soils and Geology.....	13-4
13.2.4	Air and Climate.....	13-4
13.3	Mitigation and Residual Impacts.....	13-4
14.	SCHEDULE OF MITIGATION.....	14-1
14.1	Introduction	14-1

REFERENCES

APPENDICES..... See Volume 2

TABLE OF TABLES

Table 1-1 Impact Classification Terminology (EPA, 2017).....	1-6
Table 1-2 Companies and Staff Responsible for EIAR Completion.....	1-9
Table 2-1: Planning Applications within the Application Boundary.....	2-4
Table 2-2: Planning Applications within the Vicinity of the Application Boundary.....	2-5
Table 2-3: CI Zoning Objective as per the Galway City Development Plan 2015-2021.....	2-24
Table 2-4 Scoping Consultees.....	2-30
Table 3-1 Allowable vibration during road construction in order to minimise the risk of building damage.....	3-15
Table 4-1 Population 2011 – 2016 (Source: CSO).....	4-5
Table 4-2 Population Density in 2016 (Source: CSO).....	4-5
Table 4-3 Number of Household and Average Household Size 2011 – 2016 (Source: CSO).....	4-7
Table 4-4 Population per Age Category in 2016 (Source: CSO).....	4-7
Table 4-5 Overseas Tourists Revenue and Numbers 2017 (Source: Fáilte Ireland).....	4-10
Table 5-1: Designated sites within 15 kilometres of the proposed development.....	5-10
Table 5-2: Plant species of conservation concern recorded within hectad M22.....	5-15
Table 5-3 - Bird Atlas Data records for (hectad M22).....	5-18
Table 5-4 - NBDC records for species of conservation interest in hectad M22.....	5-19
Table 5-5 NBDC records for invasive species (Hectad M22).....	5-21
Table 5-6 NPWS records for Hectad M22.....	5-22
Table 5-7 - Habitats recorded on the proposed development.....	5-24
Table 5-8 Bird species observed during field visit.....	5-32
Table 5-9 Assessment of Plans.....	5-42
Table 6.1. Estimation of Importance of Soil and Geology Criteria (NRA, 2008).....	6-3
Table 6.2. Additional Impact Characteristics.....	6-4
Table 6.3. Impact descriptors related to the receiving environment.....	6-5
Table 7-1 Receptor Sensitivity Criteria (Adapted from www.sepa.org.uk).....	7-4
Table 7-2 Local Average long-term Rainfall Data (mm) at Shannon Airport.....	7-5
Table 8-1 European sites within likely zone of impact of the Proposed Development.....	8-2
Table 8-2 Target values for Ozone Defined in Directive 2008/50/EC.....	8-4
Table 8-3 Sulphur Dioxide Data for Galway City in 2001.....	8-5
Table 8-4 Particulate Matter (PM ₁₀) Data for Galway City in 2001.....	8-5
Table 8-5 Nitrogen Dioxide and Oxides of Nitrogen Data Galway City 2001.....	8-6
Table 8-6 Carbon Monoxide Data for Galway City 2001.....	8-7
Table 8-7 Summary statistics for rolling 8-hr O ₃ concentrations in 2008: Mace Head.....	8-7
Table 8-12 Data from Met Éireann Weather Station, Shannon, Co. Clare 1981 to 2010.....	8-14
Table 9.1. Indoor Ambient Noise Levels for Dwellings from BS8233: 2014.....	9-4
Table 9.2. Likely Impact Associated with Change in Traffic Noise Level. Source: (DMRB 2011).....	9-6

<i>Table 9.3. Example Threshold of Potential Significant Effect at Dwellings</i>	9-6
<i>Table 9.4. Maximum Permissible Noise Levels at the Façade of Dwellings during Construction</i>	9-7
<i>Table 9.5. Transient Vibration Guide Values for Cosmetic Damage</i>	9-8
<i>Table 9.6. Guidance on Effects of Human Response to PPV Magnitudes</i>	9-8
<i>Table 9.7. VDV (m/s-1.75) above which Various Degree of Adverse Comment may be Expected in Residential Buildings</i>	9-9
<i>Table 9.8. Measurement Locations</i>	9-10
<i>Table 9.9. Instrumentation Details</i>	9-12
<i>Table 9.10. Noise Monitoring Results at Location A</i>	9-13
<i>Table 9.11. Noise Monitoring Results at Location N2</i>	9-14
<i>Table 9.12. Noise Monitoring Results at Location N3</i>	9-14
<i>Table 9.13. Noise Monitoring Results at Location N4</i>	9-15
<i>Table 9.14. Typical Noise Levels Associated with Construction Plant Items</i>	9-16
<i>Table 9.15. Review of Potential Construction Noise Impacts</i>	9-17
<i>Table 9.16. Change in Traffic Noise Levels with Proposed Development</i>	9-19
<i>Table 9.17. Sound Power Levels of Heat Recovery Units</i>	9-20
<i>Table 9.18. Predicted & Measured Noise Levels at Development Site</i>	9-25
<i>Table 9.19. Summary of Predicted Façade Noise Levels</i>	9-36
<i>Table 9.20. Summary of Predicted Façade Noise Levels</i>	9-37
<i>Table 9.21. External Noise Levels Required to Achieve Internal Noise Levels</i>	9-38
<i>Table 9.22. Sound Insulation Performance Requirements for Glazing, SRI (dB)</i>	9-39
<i>Table 10-1 Assessing Landscape Sensitivity</i>	10-4
<i>Table 10-2 Assessing Magnitude of Landscape Effects</i>	10-4
<i>Table 10-3 Assessing Visual Receptor Sensitivity</i>	10-6
<i>Table 10-4 Assessing Magnitude of Visual Effects</i>	10-6
<i>Table 10-5 Impact Classification Terminology (EPA, 2017)</i>	10-7
<i>Table 10-6 Features of Landscape Value</i>	10-18
<i>Table 10-7 Viewpoints</i>	10-21
<i>Table 12.1 Traffic Generation</i>	12-4
<i>Table 12.2 Traffic Generation</i>	12-4
<i>Table 13-1 Interaction Matrix: Potential for Interacting Impacts</i>	13-2
<i>Table 14-1 Proposed Mitigation Measures</i>	14-2

TABLE OF FIGURES

Figure 2-1: Site Context (Boundary Indicative Only).....	2-2
Figure 2-2: Site Context (Boundary Indicative Only).....	2-2
Figure 2-3: Proposed Site Masterplan for Knocknacarra District Centre.....	2-3
Figure 2-4: Initial Design Concept.....	2-26
Figure 3.1: Proposed Development in context of Road Network.....	3-3
Figure 3.2: Pedestrian Site Access details.....	3-5
Figure 3.3: Vehicular Site Access details during the construction phase.....	3-6
Figure 4-1 Population Study Area.....	4-6
Figure 4-2 Population per Age Category in 2016 (Source: CSO).....	4-8
Figure 4-3 Employment by Socio-Economic Group in 2016 (Source: CSO).....	4-8
Figure 4-4 Galway City Development Plan – Land Use Zoning.....	4-9
Figure 5-1 EU Sites within 15km.....	5-12
Figure 5-1a Site in relation to nearby EU Designated Sites.....	5-13
Figure 5-2 Nationally Designated Sites within 15km.....	5-14
Figure 5-3 Habitat Map.....	5-25
Figure 5-3a Habitat Map with Infrastructure Overlain.....	5-26
Figure 6.1 Local Subsoils Map.....	6-7
Figure 6.2 Bedrock Geology Map.....	6-8
Figure 7.1 Regional Hydrology Map.....	7-8
Figure 7.2 Local Hydrology Map.....	7-9
Figure 7.3 Bedrock Aquifer Map.....	7-11
Figure 7.4 Local Groundwater Bodies.....	7-13
Figure 9.1: Proposed development site outlined red.....	9-9
Figure 9.2 Noise Monitoring Locations (Source : Google Earth).....	9-11
Figure 9.3 Number of LAFmax Events Measured During the Night Periods.....	9-13
Figure 9.4 Noise Assessment Locations.....	9-17
Figure 9.5 Predicted Existing Noise Contour Across the Development Site – Daytime.....	9-26
Figure 9.6 Predicted Existing Noise Contour Across the Development Site – Night.....	9-26
Figure 9.7 ProPG Approach (Source: ProPG).....	9-28
Figure 9.8 ProPG Stage 1 – Initial Noise Risk Assessment.....	9-29
Figure 9.9 Predicted Noise Contour Across the Developed Site – Daytime.....	9-31
Figure 9.10 Predicted Noise Contour Across the Developed Site – Night.....	9-32
Figure 9.11 Designation of Predicted Noise Levels for Each Façade – Blocks A-D.....	9-34
Figure 9.12 Designation of Predicted Noise Levels for Each Façade – Blocks E-F.....	9-35
Figure 9.13 Façade Noise Levels (see Table 9.20) Block A-D.....	9-37
Figure 9.14 Façade Noise Levels (see Table 9.20) Block E-F.....	9-38

Figure 10-1 Land Use and Zoning and Specific Objectives (Source: Galway City Development Plan..10-8

Figure 10-2 Galway City Green Network (Source: Galway City Development Plan).....10-9

Figure 10-3 Galway City Park Hierarchy (Source: Galway City Development Plan).....10-10

Figure 10-4 Site topography (not to scale and for illustrative purposes only).....10-12

Figure 10-5 Aerial photograph of the proposed development site (not to scale and for illustrative purposes only)10-14

Figure 10-6 Viewpoint Locations..... 10-22

Figure 11.1 Recorded Monuments in the vicinity of the proposed development site..... 11-8

Figure 11.2 Extract from Down Survey map of Galway (1656-8) showing ‘Rahoone’ to the west of Galway city..... 11-11

Figure 11.3 Proposed site boundary on 1st edition OS background. Note Rahoone House to NE and associated shaded demesne..... 11-12

Figure 11.4 Proposed development site boundary on 2nd edition OS background..... 11-13

Figure 11.5: Proposed development site boundary in relation to Protected Structure 8301, Rahoone House..... 11-15

Figure 11.6: Proposed development site boundary in relation to nearest NIAH structure.....11-18

Figure 12-1 - Location of proposed development.....12-2

Figure 12-2 - Locations of the Traffic Counts..... 12-5

Figure 12-3 – Construction staging.....12-7

TABLE OF PLATES

Plate 5-1: Scrub (WS1) habitat in the northern sections of the site.....5-27

Plate 5-2 Dense bracken (HD1) within the north of the site..... 5-28

Plate 5-3: Spoil and Bare Ground (ED2)..... 5-28

Plate 5-4: Amenity Grassland (GA2) and Scattered Trees and Parkland (WD5) fringing the road that bisects the site5-29

Plate 5-5: Dry Meadows and Grassy Verges (GS2) occurring adjacent to existing footpaths within the south of the site..... 5-30

Plate 5-6: Road that bisects the site, classified as Buildings and artificial surfaces (BL3)...... 5-31

Plate 9-1 N1, looking SE towards dwellings at An Logán..... 9-11

Plate 9-2 N2, looking E towards dwellings at Gort na Bró..... 9-11

Plate 9-3 N3, looking N towards school..... 9-11

Plate 9-4 N4, looking NE towards existing commercial properties..... 9-12

Plate 10-1 View along the north-western site boundary.....10-13

Plate 10-2 View along the north-eastern site boundary.....10-15

Plate 10-3 View southern part of site.....10-15

Plate 10-4 Walk and cycleway separating proposed development site from Gaelscoil Mhic Amhlaigh.10-16

Plate 10-5 Example of mature trees north of the central road.....10-17

*Plate 10-6 View towards site from the entrance to Árd Na Gaoithe housing estate off the Clybaun Road.
.....10-19*

*Plate 10-7 View towards site from the entrance to Cartor Mor housing estate off the Clybaun Road....
.....10-20*

Plate 10-8 View towards site from Gort Greine housing estate off the Rahoon Road.....10-20

NON-TECHNICAL SUMMARY

1. Introduction

The Environmental Impact Assessment Report (EIAR) has been prepared by McCarthy Keville O’Sullivan Ltd. (MKO) on behalf of Glenveagh Living, which intends to apply to An Bord Pleanála (ABP) for a strategic housing scheme that forms part of mixed use development located in the townland of Ragoon, Co. Galway.

The proposed site is approximately 2.8 hectares in extent and is situated within the Gateway Development, located in the east of Knocknacarra, County Galway which lies approximately 3km west of Galway City.

The applicant for the proposed development is Glenveagh Living a division of Glenveagh Properties, PLC. Formed in 2017, Glenveagh Properties PLC has assembled a compelling 11,000+ unit landbank for building to capitalise on the favourable market backdrop which exists within the Irish residential sector. With a focus on strategically located developments in the Greater Dublin Area, Cork, Limerick and Galway, the Group comprises two complementary divisions, Glenveagh Homes and Glenveagh Living.

Glenveagh Homes' delivers high quality starter homes to its private customers with selective developments of mid-size and executive houses and apartments in areas of high demand. The business has commenced construction on 12 sites, with 800 units under construction during 2018. Glenveagh Homes has assembled a pipeline of 9,520 units with a 2,000 unit per annum output target by 2023.

Glenveagh Living delivers houses and apartments for the public sector and institutional investors. The Partnerships business focusses on mixed-tenure and joint venture opportunities with the public sector in Ireland. The PRS business delivers large-scale private rental product for institutional investors and currently possesses a pipeline of 1,850 units.

Glenveagh Living have employed an experienced Design Team to ensure that this development will be delivered to meet all the relevant planning, environmental and sustainability requirements.

Need for the Development

There is currently a significant shortage of housing units available for sale and occupancy in the area surrounding Galway City. The rapidly increasing price of housing is a result of the shortage in supply, and many people will soon find themselves unable to afford a home. This problem is also aggravated by a lack of housing units available for the rental market. The proposed development will contribute significantly to alleviating the shortage of housing supply in Galway and brings into use lands zoned specifically for that purpose.

In addition, the construction industry such as the subject development, make a significant contribution to economic development in Ireland. The recent upturn in the economy and thus the construction industry has led to an increase in demand for housing in the surrounding areas of Galway city, which the proposed development will be able to provide for.

Purpose and Structure of this EIAR

The purpose of the EIAR is to document the current state of the environment in the vicinity of the proposed development site and to quantify the likely significant effects of the proposed development on the environment. The EIAR submitted by the applicant provides the relevant environmental

information to enable the Environmental Impact Assessment (EIA) to be carried out by the competent authority.

The information to be contained in the EIAR is prescribed by statutory regulation and informed by various guidelines. The Environmental Protection Agency (EPA) recently published its 'Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, August 2017), which are intended to guide practitioners during the transition to new Regulations transposing the updated Directive. These draft guidelines have also been used in the compiling of this EIAR.

The EIAR project team comprises a multidisciplinary team of experts with extensive experience in the assessment of similar developments and in their relevant area of expertise. Each chapter of this EIAR has been prepared by a competent expert in the subject matter. The chapters of this EIAR are as follows:

1. *Introduction*
2. *Background to the Proposed Development*
3. *Description of the Proposed Development*
4. *Human Beings, Population & Human Health*
5. *Biodiversity, Flora & Fauna*
6. *Land, Soils and Geology*
7. *Hydrology and Hydrogeology*
8. *Air and Climate*
9. *Noise and Vibration*
10. *Landscape and Visual*
11. *Archaeology & Cultural Heritage*
12. *Material Assets (including Traffic and Transport)*
13. *Interactions of the Foregoing*

A Natura Impact Statement has also been prepared in line with the requirements of the Habitats Directive, and will be submitted to the Planning Authority as part of the planning application documentation.

2. Background to the Proposed Development

The Background to the Proposed Development chapter presents information on the strategic planning context for the proposed development, the site selection and design process, a description of the proposed development site and its planning history, the assessment of alternatives, scoping and consultation, and the cumulative impact assessment process.

The subject lands are designated 'Commercial/Industrial' (CI with a stated objective 'to provide for enterprise, light industry and commercial uses other than those reserved to the City Centre zone'. The site is also identified as part of the Knocknacarra District Centre in the retail hierarchy of the City. The City Development Plan includes a specific development objective pertinent to the proposed site, as set out below:

- *The site shall include for a minimum of residential/residential commercial development of a scale equivalent to 20% of the proportion of all likely future floor proposals. This residential development shall be integrated into the overall scheme.*
- *Development of these lands will only be considered where it can be shown to be linked in with the existing development and shall show how it relates to an overall layout for the area which will include for landscaping, boundary treatment and linkages with the adjoining residential development and transport services.*
- *The provision of a civic open space will be a requirement on this site and lands shall be reserved for this purpose.*

- *Any additional phase of development shall include for the front-loaded delivery of a public/community facility which can be in the form of a community facility, a community health facility, a transport facility, a park and play area over and above normal open space requirements.*
- *Any future development shall include for a number of small retail/service units which can be demonstrated to deliver a broad range of District Centre uses.*

A scoping letter providing details of the application site and the proposed development, was prepared by MKO and circulated on 13th September 2019 to statutory agencies, NGOs and other relevant parties.

This EIAR also considers the potential for cumulative effects from the proposed development with other key existing, permitted or proposed projects.

3. Description of the Proposed Development

The site area comprises approximately 2.8 hectares of land located within the townland of Ragoon, to the west of Galway City. The site is bounded by Gort na mBro road to the east and the Gateway Retail Park link road to the west. The Western Distributor Road, an arterial route serving the city, is located to the south. The surrounding area is characterised by the established residential suburb of Knocknacarra. The lands adjoining the site to the west are the location of the Gateway Retail Park.

The landcover is a mixture of well-established vegetation along the road in the centre of site and to the north-west of site and areas of dereliction with scrub and spoil in the centres of the northern and southern parts of site and along the north-eastern site boundary. There is an active construction compound located on the southern portion of the site. The portion of the site located immediately to the north of the existing Knocknacarra shopping centre is currently an active construction site and comprises a partially completed underground car park with commercial space above.

The proposed development will consist of the following:

- Construction of 332 no. residential units:
 - 93 no. 1 bed apartments
 - 219 no. 2 bed apartments
 - 20 no. 3 bed apartments
- Provision of 2,667 sq.m of commercial floorspace.
- Provision of 93 sq.m of community use facilities
- Provision of 470 sq.m of tenant amenity accommodation including shared workspaces, shared dining and lounge facilities
- Provision of 174sq.m creche facility including an external secure play area.
- Provision of 85 no. car parking spaces and provision of realigned road between Gort na Bró and Gateway Retail Park Road.
- Change of use of underground void to 181 bay underground car park
- Provision of shared communal and private open space, car parking, bicycle parking, bin storage, public lighting, site landscaping, services, signage, substation and all associated site development works.

The project is currently at planning stage and subject to approval and detailed design. It is estimated that the works would be tendered in late 2019 with commencement in early 2020 and an estimated site programme of 24 months depending on final construction phasing.

The proposed order of construction of key elements is as follows:

- Site Setup
- Earthworks, including removal of excess material off site to an authorised outlet

- Construction of substructure and services
- Super Structure Frame to buildings in sequence
- Roof and Façade finishes
- External hard and soft landscaping
- Internal fit out
- Site Landscaping

In general, the hours in which vehicles will arrive and depart will coincide with the expected site working hours of 7.00am to 7.00pm in the evening from Monday to Friday, and 8:00am to 5:00pm on Saturday.

Before completion of the construction phase of the proposed development, landscaping works will be carried out to improve the visual amenity of the site. These landscaping works will follow the layout of the landscape plan provided in the Landscape Master Plan.

Routine inspections of construction activities will be carried out on a daily and weekly basis by the Senior Project Manager, Senior Engineers and Foremen to ensure all controls to prevent environmental impact, relevant to the construction activities taking place at the time, are in place.

4. Population & Human Health

One of the principle concerns in the development process is that people, as individuals or communities, should experience no diminution in their quality of life from the direct or indirect impacts arising from the construction and operation of a development.

Information used in this study was sourced from the Census of Ireland 2011 and 2016, which is the most recent census, the Census of Agriculture 2010 and from the CSO website, www.cso.ie. Census information is divided into Republic of Ireland, CO. Galway and Galway City. The 2016 census data for the Republic of Ireland was consulted as part of the assessment process, and upon comparison with the relevant 2011 data, was found to be consistent. Although, as shown in Chapter 4; between 2011 and 2016 there has been a steep increase of approximately 3000 people within the project Study Area, as represented in the census data.

There are a wide range of services available in the area. Retail and personal services are found throughout Galway city, with local services in the Gateway Retail Park adjacent to the site and the Westside area of the city. The Westside Branch of the Galway City Council Library is located on Seamus Quirke Road approximately 1.5 kilometres northeast of the site. The Knocknacarra Medical Centre provides primary care services from a location approximately 0.75 kilometres southwest of the site. University Hospital Galway is located approximately 2 kilometres northeast of the site, while Bon Secours Hospital is also located within the Study Area. Most of the amenities and community facilities, including GAA and other sports clubs, youth clubs and recreational areas, are available in the areas surrounding the site (i.e. Knocknacarra and Salthill), as well as in the wider Galway City.

The primary school located closest to the proposed development site is Gaelscoil Mhic Amhlaigh, located immediately adjacent to the northern boundary of the proposed development site. The secondary school located closest to the proposed development site is Colaiste Einde, which is located on Threadneedle Road approximately 800 metres southeast of the site. There are over 30 primary schools and 13 secondary schools within the study area for the project. The National University of Ireland (NUI) Galway main campus is located 2.4 kilometres to the northeast of the site. Galway Mayo Institute of Technology (GMIT) is also located within the study area. It is estimated that approximately 20% of the population of Galway city are students.

Key tourist attractions within the wider area of Galway City include NUI Galway, a number of theatres, Sports facilities (Eamon Deacy Park, The Sportsground, Galway Racecourse, Pierce Stadium, etc.). There will be a slight positive cumulative operational impact on tourism between the proposed site and

other projects in the area, where an increase in residents and tourists within the area will allow for a positive influence on local tourism.

5. Biodiversity

Dedicated ecological surveys of the proposed development were undertaken on the 29th of April 2019. Habitats within the site were classified based on vegetation present and management history. During the multi-disciplinary ecological walkover surveys, the potential for the study area to support protected birds, mammals, amphibians and additional fauna was assessed.

The site is a greenfield site in an urban area and has been subject to excavation works and contains concrete structures from the previous work in 2008. The results of the survey returned no signs of protected or ecologically sensitive habitat. All habitats recorded on-site were determined to be of local importance and of low ecological importance. The site is dominated by scrub and spoil and bare ground, contains buildings and artificial surfaces and supports dry meadows and grassy verges around the periphery of the site. There are also small areas of amenity grassland, scattered trees and parkland, and recolonizing bare ground within the development site.

No surface watercourses are present on-site or adjacent the site; it was determined that groundwater may be vulnerable to pollution due to the presence of shallow rock. No third schedule invasive species were recorded on site, nor was any evidence of protected fauna and flora recorded. No impacts upon receptors of ecological significance are anticipated during the operational phase of the proposed development.

Effects upon flora and fauna as a result of removal of vegetation during the construction phase of development were determined to be negative, but slight in magnitude, and given that the landscaping plan accompanying this development includes replacement planting with pollinator species, residual long-term effects are likely to be '*not significant*' at any geographic scale.

Effects upon nationally designated sites as a result of the proposed development are not anticipated, given that impacts to groundwater and surface waters will be prevented, or mitigated where necessary, during the construction of the proposed development. Like any construction project measures will be in place to prevent and mitigate any effect upon groundwater and surface water resources and these have been detailed in the hydrology chapter of this EIAR.

Effects upon European Sites are discussed within the Natura Impact Statement which accompanies this report. The NIS concluded that the proposed development, by itself or in combination with other plans and projects, in light of best scientific knowledge in the field, will not adversely affect the integrity of European sites, and no reasonable scientific doubt remains as to the absence of such effects. No significant effects upon biodiversity, flora and fauna as a result of the proposed development are anticipated, given that the proposed development is carried out in compliance with procedures of best practice, and that mitigation is duly applied where necessary.

6. Land, Soils and Geology

A desk study of the proposed development site and the surrounding study area was completed along with a walkover survey and site investigations. In addition, a site inspection of the proposed development site and surrounding area was undertaken by an engineer from Ground Investigations Ireland Ltd (GII) on 29th April 2019.

The proposed site consists of scrub land in the northern portion of the site and a construction compound in the southern portion of the site. There is a small area of landscaping adjacent to the access road that bisects the site. The existing underground void to the northwest of the main development site was constructed during Phase 2 of the Gateway Retail Park development. This area consists of a concrete lined underground void.

The elevation of the site ranges between approximately 27m and 32m OD (metres above Ordnance Datum). The overall local topography generally slopes from north to south with an undulating topography. The dominant land use on the bordering land is commercial development to the west, a primary school to the north, and residential development to the south and east.

The Proposed Development site is underlain by the Errisbeg Townland Granite which is part of the Galway Granite formation. This comprises Devonian Megacrystic pink/grey monzogranite (GaEb). These granites are classified by the GSI as a Poor Aquifer -Bedrock which is Generally Unproductive except for Local Zones (Pl).

There are no known areas of soil or ground contamination on the site. During the site walkovers, no areas of particular contamination concern were identified. There are no recorded Geological Heritage sites within the proposed development area.

An assessment of the construction and operational phases of the development have been completed, along with a cumulative assessment for the development. An assessment of the potential health effects in relation to soils and geology has also been undertaken. Based on the above, and with implementation of the outlined mitigation measures, no significant impacts on human health and the soils and geology environment are predicted to occur.

7. Hydrology and Hydrogeology

The hydrology and hydrogeology aspects of the site has been characterised using desk study information and detailed site walkover completed in November 2018. Any potential sources of flooding, likely routes of floodwaters and key features of the site were assessed to inform a Site Specific Flood Risk Assessment completed for the development.

The proposed development site does not contain field drains or natural watercourses. In general, the site of the proposed development is well drained with rainfall percolating to ground and likely travelling via subsurface flow to the culverted stream located at the eastern side of the site., There is a gently sloping topography which is likely to reflect the direction of groundwater flow at the site which is likely from northwest to southeast. There was no surface water or ponding of water observed on the site. The existing roadway that bisects the site is served by gullies which discharge to the municipal storm water drainage system.

The Knocknacarra Stream rises to the north of the site at Letteragh and flows southward over a distance of 3km to the sea. A large portion of the lower reach of the Knocknacarra Stream is culverted almost to its sea outfall at Rusheen Bay near Blakes Hill at Salthill. A tributary stream which formerly ran through the site was culverted and realigned to form the surface water sewer network as part of a nearby development in 1996. There are currently no open surface watercourses or drains on the site. A detailed flood risk assessment has been completed and there are no recurring flood incidents within the study area boundary according to the OPW's flood mapping. OPW PFRA maps for the area indicates that the eastern area of the site could be impacted by a potential fluvial flood risk zone. No risk of pluvial or coastal flooding is highlighted on the site.

A Site-Specific Flood Risk Assessment (SSFRA) has been prepared for the proposed development (DBFL Consulting Engineers, 2019). This report determined that the Site is within Flood Zone C and concluded that the residential development proposed is appropriate for the Site's flood zone category.

The assessment found that the development has a good level of flood protection up to the 100-year return event. For pluvial floods exceeding the 100-year capacity of the drainage system mitigation measures are proposed to deal with any potential flooding of the constructed development.

The bedrock, which underlie the site are classified as a Poor Aquifer – Bedrock which is Generally Unproductive except for Local Zones (Pl). The vulnerability of the aquifer underlying the site is

classified as predominately “Extreme” due to the presence of rock near the surface. The presence of rock near the surface means that there is little or no protection afforded to any potential bedrock aquifer by soils and subsoils.

There are no groundwater protection zones mapped within the proposed development site or study area. There are no mapped private well locations (GSI database to accuracy of <50m) within 1km, which were obtained from the GSI well database (www.gsi.ie).

The primary risk to groundwater at the site would be from cementitious materials, hydrocarbon spillage and leakages. These are common potential impacts on all construction sites (such as road works and industrial sites). All potential contamination sources are to be carefully managed at the site during the construction and operational phases of the development and mitigation measures are proposed to deal with these potential minor impacts.

Surface water drainage measures, pollution control and other preventative measures have been incorporated into the project design to minimise significant adverse impacts on water quality and downstream designated sites.

Overall the proposal presents no significant potential for impacts to surface water and groundwater quality provided the proposed mitigation measures are implemented.

8. Air and Climate

Due to the nature of the development, the general character of the surrounding environment and publicly available information on air quality, air quality sampling, was deemed to be unnecessary for the EIAR.

The Environmental Protection Agency (EPA) has designated four Air Quality Zones for Ireland:

Zone A: Dublin City and environs

Zone B: Cork City and environs

Zone C: 16 urban areas with population greater than 15,000

Zone D: Remainder of the country.

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the Framework Directive and Daughter Directives. The site of the proposed development lies within Zone C, which represents urban areas with a population of greater than 15,000.

The ambient air quality monitoring carried out closest to the subject site is at Bohermore in Galway City. This monitoring location also lies within Zone C. The air quality in the vicinity of the proposed development site is likely to be quite similar in nature and composition. For the purposes of this assessment, air quality monitoring data from the station at Bohermore in Galway City is used.

Dust is a common emission from construction sites and requires management. As limited excavation works are proposed, the potential for dust generation is limited however mitigation measures have been developed to reduce any potential dust levels.

9. Noise and Vibration

The proposed development site is a greenfield site bounded by the Western Distributor Road to the south, commercial lands/plots to the west, residential properties to the east, and a school to the north. The existing noise and vibration environments across the development site and in the vicinity of the

nearest existing noise sensitive locations are dictated by transportation sources in the study area including the existing Western Distributor Road and Gort na Bró.

The nearest existing residential noise sensitive locations to the proposed development are those located in the Gort na Bró estate some 20m to the east of the site and those residential properties in the Logan estate some 35m to the south of the site, along Western Distributor Road. In addition to the residential receptors discussed above, there is an educational facility located adjacent (within 10m) to the northern section of the site.

The soundscape in the vicinity of receptors surrounding the proposed development site was characterized through a combination of attended and unattended noise monitoring undertaken in February 2019. Monitoring was carried out at four stations. Daytime noise levels were recorded at all monitoring locations, night-time noise levels were recorded at only one station. Recorded data indicate that local and distant road traffic dominates the soundscape along with some construction noise from adjacent building sites.

The proposed development comprises a mixed-use development of residential apartments and various ground floor commercial units. The development also includes ancillary developments including car and bicycle parking areas, internal road layouts and landscaping. During the operation phase of the project, the closest receptors to most onsite sources will consist of the proposed onsite residential units. Taking into account that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria is achieved within the development it is expected that there will be no negative impact at sensitive receivers off site.

During the construction phase of the project there is the potential for temporary noise impacts on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable.

10. Landscape and Visual

The Landscape & Visual assessment is based on desk study of the study area, field surveys of the site and surrounds and the use of photographs and photomontages from representative viewpoints of the site. The landscape of the area is described in terms of its existing character, which includes a description of the physical and visual character, landscape values and the landscape's sensitivity to change. The potential impacts in both landscape and visual terms are then assessed, including cumulative impact.

The overall topography of the development site undulates with several raised banks. The greatest gradients are on the slopes of these raised banks at various locations around the site and are up to approximately 1 in 2 or 50%. The elevation of the proposed development site ranges from approx. 27.50 m OD (Ordnance Datum) in the southern tip of the site to approx. 31.60 m in the northern part of the site. The road separating the northern and southern parts of the site is level at approximately 29 m OD with banks rising either side of the road. The landcover is a mixture of well-established ornamental planting along the road in the centre of site and to the north-west of site and areas of dereliction with scrub and rubble in the centres of the northern and southern parts of site and along the north-eastern site boundary. The southern part of the site mainly consists of a fenced-off hardstanding surrounded by semi-mature trees and grass to the east and south. The area that makes up the proposed development site is not currently in use, save for the southern part, which appears to be currently used as a construction compound.

Land-use in the wider landscape is a mix of commercial and residential. The surrounding area is characterised by the established residential suburb of Knocknacarra. The lands adjoining the site to the west are the location of the Gateway Retail Park.

As part of the assessment, 10 viewpoint photos were taken so as to represent a variety of views within 1 kilometre of the site. The choice of viewpoint locations is influenced by both the views available and the type of viewer. These include viewpoint locations from or close to local settlements as well as locations on regional and local roads at varying distances from the site. Care was taken to provide a range of views from various elevations, distances and orientations.

The Landscape Master Plan, prepared by ÁIT, has been well designed and will provide an attractive setting for the housing development. This will provide some screening to the proposed development. All residential roads have been designed with street trees and there are more formal ornamental open spaces within the proposed development.

Landscape Effects

The landscape effects of the proposed development are described in relation to both effects on the wider landscape character and effects on the landscape of the site. The landscape is regarded as modified by previous land uses. There are limited attractive landscape elements, semi-mature and some mature trees being the most significant. Site vegetation consists mainly of rough grassland, scrub, gravelled areas, rubble and mature planted areas. On the grounds of these points the landscape value is considered Low. Overall, the predicted landscape impact of the proposed development is deemed to be Moderate and the overall landscape character of the area will change from being predominantly suburban and some areas of wasteland to slightly more urban.

The introduction of the 332 No. residential units into the existing landscape represents new man-made elements, which in some views of the site will change the character of the landscape. However, distance and screening by landform and vegetation will lessen this impact and in certain locations where degradation of the landscape has occurred the change that will result in a positive effect.

Overall the proposed development will have a Permanent, Moderate, Neutral to Negative Impact on the character of the landscape.

Visual Effects

The proposed development can only be seen from a very limited area outside the site as illustrated in the photomontages for Viewpoints 1 to 10. Visual receptor sensitivity was considered High from residential areas such as Viewpoints 2, 3 and 6. The other viewpoint with medium to highly sensitive visual receptors was Viewpoint 5 on the Millers Lane greenway. From other areas such as local road, a business park, supermarket entrance and a recreation area (Viewpoints 1, 4, 7, 8, 9A, 9B and 10) visual receptors were considered far less sensitive.

Generally, the magnitude of change as well as the visual effects were greatly dependent on proximity of the viewpoints to the proposed development such as in the three furthest viewpoints (Viewpoints 4, 6, 7 and 10) where it was classed as Low and Imperceptible/Not Significant, respectively. Screening, however also reduced the visual effect, e.g. in Viewpoint 8, where screening by buildings reduced the impact. For the remaining viewpoints the magnitude of change was deemed Medium to High or High. The visual effect was classed as **Moderate to Significant** as due to proximity the spatial extent of the proposed buildings in the view was significant and generally resulted in a marked raising of the skyline.

Overall the visual impact is deemed moderate which means it alters the character of the environment in a manner consistent with existing and emerging trends. The proposed development is in keeping with its zoning status and the emerging trends of development proposed in the vicinity.

11. Archaeological & Cultural Heritage

No protected structures are located on or within the immediate vicinity of the proposed development site. The nearest Protected Structure is Rahoon House (Ref 8301), located c. 298m to the north-east of the proposed development site boundary.

No recorded monuments are located on the proposed development site. The nearest recorded monument is located c. 95m to the east-north-east of the proposed development area and comprises a designed landscape feature (GA094-056). To the south-east of this is a ringfort (GA094-111) which is situated c. 225m to the east of the proposed development site (Figure 11.1).

No direct or indirect impacts to the recorded archaeological or cultural heritage resource as a result of the proposed development have been identified therefore no mitigation measures are required.

The southern portion of the site has been subject to ground works, therefore this area has no potential for the presence of sub-surface archaeology. In-situ topsoil appears to be present in the northern part of the site. A potential direct impact to as yet unidentified sub-surface archaeological features, which may exist within the northern portion of the proposed development site, may occur as a result of ground works.

Based on the assessment the proposed development will have no significant effect on architectural heritage, as no protected structures are located within or in the immediate vicinity of the proposed development site.

To mitigate any potential impacts to sub-surface archaeological impacts, archaeological monitoring of all topsoil removal should be undertaken by a suitably qualified archaeologist. The monitoring of topsoil stripping within the site in advance of the proposed development may uncover features of archaeological significance, which in turn may be the subject of preservation by record (excavation). These excavations may add to our knowledge of the archaeological heritage of the site. The potential impacts of the proposed development on archaeological heritage are rated as long term, slight. Based on the assessment above there will be no significant effects on archaeological heritage.

12. Material Assets

Traffic and Transport

The local road network in vicinity of the existing and proposed development site is made up of single carriageway local and connector roads. The Western Distributor Road is a major link through the Gort na Bró to Bishop O'Donnell Road connecting Knocknacarra North and South with Galway City Centre. There is a 50km/h speed limit on the roads adjacent to the site. The junctions in vicinity of the site are uncontrolled with roundabout junctions along the Western Distributor Road and Gort na Bró. These two roundabouts and the mini roundabout at the entrance to Gateway Retail park are the busiest junctions in this area. The proposed development is predicted to generate 116 trips in weekday morning peak, 154 trips at weekday PM peak and 169 trips at weekend peak times.

An analysis of the likely effects of the proposed development on traffic and transport was conducted by Atkins. Traffic count surveys were taken at different locations within the road network in vicinity of the site to gain an understanding of the current traffic conditions and current traffic flows. These included 6 no. Automatic Traffic Counts (ATC) and 8 no. Junction Traffic Counts (JTC) in locations shown in Figure 12-2 of this EIAR.

Impacts of the Proposed Development

During the construction phase of the project the increase in traffic volumes as a result of construction vehicles visiting the site is not considered to be excessive and will be spread out over the duration of the construction phases of the development. Due to the designated access points off the existing Gort na Bro roundabout and the Local Road, allowing delivery vehicles to pull off onto the site, there will be no significant disruption on the traffic flows as a result of the construction of the development.

During the operation phase of the project access to the proposed development is to be facilitated via the new traffic signalized junction, inclusive of pedestrian and toucan crossings, Link Road and improvement to the existing L5000 proposed as part of the project. This includes carriageway widening, provision of two-way cycle lane and footpaths. Additionally, a network of pedestrian links are proposed as part of the development, including a link connecting the Gort na Bro roundabout with the Local road and the existing Gateway Retail park enhancing pedestrian connectivity in this area. It is anticipated that a total of 116 trip movements are expected in the weekday AM peak and a total of 154 trip movements in the weekday PM peak. A total of 169 trip movements are expected during weekend peak . Sensitivity testing indicates that the development will have a very minor impact on the surrounding road network.

Mitigation Measures

The proposed development has integrated a number of measures in line with the relevant standards and guidelines, such as DMURS 2013 and the National Cycle Manual, which promotes the use of sustainable travel to and from the site.

The Road Safety Audit carried out for the proposed development during the planning stage considered various aspects such as, junction design, provision for pedestrians, provisions for cyclists and road signage, marking and lighting. Recommendations noted from the independent company undertaking the road safety audit, Atkins, have been taken into account and the concerns raised have either been designed out or will be considered and suitable measures put in place during the detailed design stage.

The volumes of traffic generated from the proposed development will have a long-term negligible negative effect on the surrounding roads and highway network traffic volumes and can be considered within the norms for urban developments.

The provision of cycle and pedestrian links proposed as part of the development will have positive impact on permeability and connectivity within this area. Furthermore, this development will provide substantial bicycle parking facilities and car share club facility all of which will enhance sustainable travel modes and will have positive impact on sustainable travel profile of Knocknacarra suburb.

Other Material Assets

There are a number of services located in the area surrounding the site including electricity, gas, water, sewage and telecommunications networks. Best practices will be implemented to ensure that there are no significant impacts on these, and to ensure safety of the site workers. Site specific Waste Management Plans will be in operation through the construction and operational phases.

13. Interaction of the Foregoing

The preceding Chapters 4 to 12 of this EIAR identify the potential environmental impacts that may occur as a result of the proposed development in terms of Population and Human Health, Biodiversity, Flora and Fauna, Land, Geology and Soils, Hydrology and Hydrogeology, Air and Climate, Noise and Vibration, Landscape and Visual, Archaeological and Cultural Heritage and Material Assets. All of the potential significant effects of the proposed development and the measures proposed to mitigate them have been outlined in the preceding sections of this report. However, for any development with the

potential for significant environmental effects there is also the potential for interaction amongst these potential significant effects. The result of interactive effects may exacerbate the magnitude of the effects or ameliorate them or have a neutral effect.

A matrix is presented in Table 13.1 to identify interactions between the various aspects of the environment already discussed in this EIAR. The matrix highlights the occurrence of potential positive or negative effects of the proposed development. The matrix is symmetric, with each environmental component addressed in the previous sections of this EIAR being placed on both axes of a matrix, and therefore, each potential interaction is identified twice.

Interactions have been identified between effects on Population and Human Health and effects on Noise and Vibration, Air and Climate, Hydrology and Hydrogeology. Interactions have been identified between effects on Biodiversity, Flora and Fauna with effects on Soils and Geology, Hydrology and Hydrogeology, Noise and Vibration. Interactions have been identified between effects on Soils and Geology with effects on Hydrology and Hydrogeology. Interactions have been identified between effects on Air and Climate with effects on Material Assets.

Where any potential interactive effects have been identified, appropriate mitigation is included in the relevant sections (Sections 4-12) of the EIAR.

In general, there are no significant negative effects associated with the proposed development or potential interactions. The development has been designed to ensure it is in keeping with its surrounds, has limited potential for environmental emissions and will have a generally positive effect for the local community and Galway City.