

Volume 8: Appendices (Introductory)

# Appendix 1.1

## Competent Experts

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**Table 1: Competent Experts**

Topic	Competency Summary
EIAR Project Manager	<p><b>Fiona Patterson – Arup</b>  MSc, BSc, DipFEcol, AdvDip Planning &amp; Env Law</p> <p>Fiona Patterson has over 18 years’ experience as an Environmental Consultant, based in the Arup Cork office. She holds an honours degree (BSc.) Earth Science, University College Cork (1997), a masters degree (MSc) Environmental Engineering, Queens University Belfast (1998), a diploma (DipField Ecol) Field Ecology, University College Cork (2016) and an Advanced Diploma in Planning and Environmental Law with Kings Inns (2018) . She is an Affiliate Member of the Institute of Environmental Management &amp; Assessment (IEMA).</p> <p>Since 2000, Fiona has prepared, or coordinated the preparation of numerous environmental impact statements (EIS / EIARs) for a wide range of industrial, infrastructure, institutional, commercial and residential projects.</p> <p>Fiona primarily manages the environmental aspects of major projects through the planning process including EIA scoping and EIA screening, environmental constraints and route / site options analysis, Environmental Impact Assessment Reports (EIAR / EIS) and Appropriate Assessment (AA). Fiona also manages the preparation of environmental audits, industrial licencing reports and environmental due diligence reports. Fiona has prepared numerous chapters of EIARs and has coordinated and delivered many EIAR / EISs for large infrastructural developments including M20 Cork to Limerick Motorway, Douglas Flood Relief Scheme, Indaver Ringaskiddy Resource Recovery Centre, Blanchardstown Regional Drainage Scheme and Shannon LNG Terminal. Fiona has presented expert witness evidence at the An Bord Pleanála oral hearings. Fiona has been involved in the preparation of the NISA EIAR since 2021 and has been responsible for the overall delivery of all aspects relating to environmental assessment from scoping stage to preparation/reviews and completion of EIAR.</p>
EIAR Coordinators (Onshore)	<p><b>Zak Henderson – Arup</b>  MSc, BA (Hons)</p> <p>Zak has over two years’ experience as an Environmental Consultant with an MSc in Sustainable Resource Management from the University of Limerick. Zak has experience within the EIA, AA and SEA processes and has delivered EIA Screening Reports, Reports for the Screening for Appropriate Assessment and Natura Impact Statements within the renewable energy and town planning sectors. Zak has also provided support to the Foreshore Unit within the Department of Housing, Local Government and Heritage as part of a panel of Independent Environmental Consultants to assess Foreshore Applications.</p>
	<p><b>Peter Mumford – Arup</b>  BMus (hons), BSc (hons)</p> <p>Peter has significant experience in EIA, acoustics, carbon and multi-disciplinary environmental design and assessment. He has undertaken EIA coordination roles as well as design coordination and management roles on various infrastructure projects. He has a first-class degree in Acoustics and a post-graduate certificate in Geographical Information Systems (GIS). He is a member of the Institute of Acoustics.</p> <p>Peter's focus on multi-disciplinary design and assessment originated in an environmental design role as part of the EIA assessments on the HS2 Phase 2B project and continued as EIA coordinator on the Victoria North River Works project in Manchester: more recent roles include environmental design coordination and design and project management roles on the East West Rail project.</p>

Topic	Competency Summary
	<p><b>Debbie Flynn – Arup</b></p> <p>BSc</p> <p>Debbie has over six years’ experience as an Environmental Consultant, based in the Arup Cork Office. She holds a BSc in Environmental Science from the University of Limerick. Debbie primarily works on the preparation of planning documentation including Environmental Impact Assessment Reports (EIAR) and EIA Screening Reports but also has experience in constraints report and feasibility reporting, options reporting and the preparation of non-statutory environmental reports relating to the foreshore consent process. Debbie has co-ordinated and contributed to the preparation of a number of large-scale EIA developments including Greenlink Interconnector, Arklow Wastewater Treatment Plant, Custom House Quay Development and IDL Midleton Capacity Expansion.</p>
EIAR Coordinators (Offshore)	<p><b>Carleen Collier – GoBe Consultants Ltd</b></p> <p>MSc, BSc</p> <p>Carleen is a Principal Consultant with a technical background in environmental impact assessments and project management going back over 16 years. She has experience leading assessments on a wide range of large scale infrastructure projects including road, rails and renewables.</p> <p>Carleen joined GoBe Consultants in early 2021 and since then has been contributing to the delivery of a number offshore wind farm projects at different project stages. This includes derogation planning matters for Hornsea Three Offshore Wind Farm; onshore constraints and site selection work for Outer Dowsing Offshore Wind Farm; and a non-material change for East Anglia Three Offshore Wind Farm. Prior to this, Carleen was based in Australia where she was an Associate Director in the Environment team for AECOM Australia. Within her time there, she has held different positions on many key projects including: EIA manager for the C2K Inland Rail Project for ARTC; Mitigation and monitoring lead for the Davis Aerodrome Project; and several onshore wind farm projects within Australia (Clarke Creek Wind Farm, Coopers Gap Wind Farm, Banana Range Wind Farm, Kaban Wind Farm, Dulacca Wind Farm and Iron Leaf Wind Farm).</p> <p>In addition to this Carleen also worked for 5 years as an environmental scientists based in the West Midlands, where she undertook focused work on environmental desk studies, coordinating and managing projects and providing advice on environmental impact assessments. She was involved with a variety of project tasks including contaminated land, plan and policy appraisals, due diligence reports, ecological assessments, air quality reports, transport appraisals and sustainability appraisals.</p> <p><b>Helen Millar – GoBe Consultants Ltd</b></p> <p>MSc, BSc</p> <p>Helen has a background in Marine Biology and Zoology and studied a Masters degree in Marine Environmental Protection, which put marine science in the context of policy. Throughout her studies, Helen worked on topic relating to the indirect impact of offshore renewables. She assessed how submerged renewable energy installations were affecting turbidity according to tide, and the resultant effects on the diel vertical migration patterns of schooling fish for her undergraduate dissertation. She then worked with an Atlantic puffin colony on the Skerries, off Anglesey, for her Masters thesis, collaborating with the RSPB to conduct the fieldwork and using R software to produce models and analyse the data. The study compared how foraging and breeding success varied according to tidal and meteorological conditions, to investigate the potential effects of an offshore wind development and proposed tidal stream array on the colony. Before joining GoBe, Helen worked for APEM Ltd. as a Marine Wildlife Analyst, processing images taken during aerial surveys and identifying seabird, fish and marine mammal species. Other responsibilities included checking georeferencing accuracy and mapping species distribution for use in annual reports. Data collected contributed towards the EIA process for offshore development.</p>

Topic	Competency Summary
Offshore Technical Advisor	<p><b>Gayle Boyle – GoBe Consultants Ltd</b></p> <p>MSc, BSc</p> <p>Gayle is a Chartered Environmentalist and member of the Chartered Institute of Ecology and Environmental Management. Her experience within environmental consultancy extends over 22 years, with key expertise being within the fields of ecology and Environmental Impact Assessment (EIA) and Habitats Regulations Appraisal / Assessment (HRA). Within GoBe, Gayle's key role is technical lead to the Scottish team. Gayle is highly experienced in the application of the EIA and Habitats Regulations within the UK, particularly project management and coordination with respect to Scottish legislation and its implementation on marine renewables. Examples of project involvement include large scale offshore wind developments and other marine energy projects as well as onshore power, industrial, residential, brownfield, transportation and coastal recreational development. Most recently Gayle has supported developers with their ambitions for the Round 4 and ScotWind offshore wind leasing processes (fixed and floating technology) through site selection and bid preparation services. Gayle has extensive experience in the production of documents for the various stages of EIA and HRA processes, along with organisation and participation in public exhibition and stakeholder consultation and engagement. Gayle's knowledge and skills have been deployed over a variety of projects associated with terrestrial, marine and intertidal environs, with a particular capability to coordinate the interaction between these various environs and legislative requirements. She has a specific interest in providing specialist advice on marine and terrestrial ecological issues and their interface, with a wealth of experience in species-specific surveying, protected species licensing and production of mitigation statements.</p>
EIAR Reviewer	<p><b>Ria Lyden – Arup</b></p> <p>BE, MBA, CEng, FIEI, MStructE</p> <p>Ria is a chartered engineer and fellow of the Institution of Engineers of Ireland. Currently, she is a consultant and strategic advisor to Arup. She has over 45 years' experience in engineering design and construction in Ireland, the United Kingdom and Australia. Ria has significant experience in environmental engineering, industrial emissions licensing, and environmental due diligence audits. She provides strategic advice to clients on planning, permitting and liaison with the regulatory authorities in Ireland. Ria has worked on numerous large-scale infrastructure and industrial developments including Arklow Flood Relief Scheme, SSE Renewables Arklow Wind Park Phase 2 Onshore Grid Infrastructure, Greenlink Interconnector, PSE Kinsale Energy Kinsale Area Decommissioning Project, Ervia Carbon Capture and Storage (CCS) Feasibility Study, Shannon LNG, Apple Data Centre and Indaver Resource Recovery Centre. She has prepared, supervised the preparation of or reviewed numerous environmental impact assessment reports and applications for industrial emissions/integrated pollution prevention and control licences over more than 30 years. Ria was the strategic advisor to the Arup team which acted as an independent environmental consultant to the Department of Housing, Local Government and Heritage Foreshore Section in reviewing the environmental aspects of foreshore licence applications.</p>
Technical EIAR Reviewer (Chapter 35 Offshore Bats)	<p><b>Chloe Delgery – Arup</b></p> <p>MSc, MPhil, MCIEEM, CEnv</p> <p>Chloe is an Associate Ecologist and Chartered Environmentalist with over 18 years' nature consultancy experience. She holds French equivalent of BSc (Hons) in Ecosystems Biology (three-year degree including a one-year ERASMUS exchange programme at Portsmouth University, 2000), an MSc in Integrated Environmental Studies, University of Southampton (2002) and an MPhil in Marine Biology, University of Portsmouth (2005). She is a full member of the CIEEM, holds protected species licences for bats, dormouse and great crested newts in England and Wales, and is a certified tree climber.</p> <p>Chloe has worked for a diverse range of clients in a broad range of markets, including energy generation, highways, water utilities, rail, residential and industrial development, and defence sectors. Chloe has particular experience in NSIP and DCO projects, including expert witness experience</p>

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	<p>for projects such as the A417 Missing Link, and also works internationally, providing support on biodiversity matters during due diligence and environmental assessment phases.</p> <p>Chloe has devised and implemented complex mitigation solutions for a wide range of protected species, with a particular expertise in bats. This has led her to become one of few consultants awarded Level 3 Accreditation to use Natural England’s Bat Earned Recognition Class Licence CL47.</p>
Project Director	<p><b>Clodagh O’Donovan – Arup</b>  BEng, MEngSc, CEng, FIEI, FConsEI,</p> <p>Clodagh is a chartered Civil Engineer, with nearly 30 years' experience in the consultancy business in Ireland. As Planning Service Team Leader for Arup Ireland, Clodagh has direct responsibility for both the team and the projects that it undertakes - across environmental consulting, transport planning, master planning and landscape architecture and climate change and sustainability consulting. She has significant experience in the management and delivery of complex, multidisciplinary projects. She has specialist knowledge in the energy and water services sectors, having led a wide range of such projects throughout her career, particularly in renewable energy where she has developed specialist knowledge. She has been involved in these projects from inception to completion, and has particular experience in EIA, statutory process and detailed design.</p>
Engineering Director	<p><b>Michael Daly – Arup</b>  MBA, MEngSc, BE</p> <p>Michael is a Civil Engineer with master’s degrees in Structural Engineering and in Business Administration. He obtained Chartered Engineer status with Engineers Ireland in 2003. Michael has twenty-five years' experience in the development and delivery of multi-disciplinary energy infrastructure projects from concept to commissioning. His experience includes technical advisory and project delivery from the inception of projects through to completion, including feasibility studies, development strategies, stakeholder engagement, design, consenting, procurement, and delivery. This experience has been gained on major energy infrastructure projects, both onshore and offshore.</p> <p>Within Arup in Ireland, Michael is a member of the Group Management team as well as Energy Business Leader, and the leader of the Energy &amp; Water Service Team.</p>
Engineering Team	<p><b>Ian D’Arcy</b>  BE Civil and Structural Engineering, Dip in Highway &amp; Geotechnical Engineering,</p> <p>Ian is a Charter Engineer with Engineers Ireland in the Dublin Highway Team since joining in 2022. Ian has over 15 years’ experience on large infrastructure projects. Ian has extensive experience in construction methodology for Highway projects.</p> <hr/> <p><b>Michael Owens – Arup</b>  BEng (Hons) CEng MIEI</p> <p>Michael Owens is a Senior Civil Engineer with Arup. He holds a BEng (Hons) in Civil and Environmental Engineering from University College Cork. He is a chartered member of Engineers Ireland. He has over 11 years’ experience entailing a broad experience covering all aspects of project delivery including construction delivery, project management, detailed design, construction supervision and PSDP functions across a wide range of sectors including tunnelling, bridges, rail, and energy infrastructure.</p>

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	<p>Michael has extensive experience of the detailed civil &amp; structural design of energy infrastructure, particularly in the context of EirGrid submissions and approval processes. Michael has been involved in the NISA project since late 2023 upon joining Arup.</p> <p><b>Nishikant Dash - Arup</b> BE, M.Tech and MBA</p> <p>Nishikant Dash is a Senior Project Engineer with Arup. He holds a Bachelor of Engineering (BE) degree in Civil Engineering from SGGSIE&amp;T, Nanded, Masters of Technology (M.Tech) degree in Structural Engineering from National Institute of Technology (NIT), Rourkela and Masters of Business Administration (MBA) from Pondicherry University. He has over 11 years' experience of working on balance of plant design review and management of onshore, intertidal and offshore wind farms across Asia Pacific and Europe region. Before joining Arup, he had worked in DNVGL Renewable Certification and Vestas. As a member of the Arup energy team Nishikant typically takes on the role of Senior Project Engineer or engineering lead / project manager in the delivery of large-scale energy infrastructure projects. Nishikant has been involved in the NISA project since 2023.</p>
Chapter 1 – Introduction	<p><b>Fiona Patterson and Zak Henderson - Arup</b> As above</p>
Chapter 2 – EIA Methodology	<p><b>Fiona Patterson – Arup</b> As above</p>
Chapter 3 – Legal and Policy Framework	<p><b>Fiona Patterson and Zak Henderson - Arup</b> As above</p>
Chapter 4 – Need for the Proposed Development	<p><b>Fiona Patterson and Zak Henderson - Arup</b> As above</p>
Chapter 5 – Consideration of Alternatives	<p><b>Fiona Patterson and Clodagh O'Donovan – Arup</b> As above</p> <p><b>Anna Jameison, Statkraft</b> MSc, PIEMA</p> <p>Anna is a Consent Manager with Statkraft and has over fifteen years of diverse renewable energy project experience including offshore and onshore wind and run-of-river hydroelectric facilities. Prior to joining Statkraft Anna was the Offshore Consents advisor on the Seagreen Offshore Wind Farm.</p> <p>Anna holds an MSc in Environmental Management from the University of Nottingham and a BSc in Geography from the University of Strathclyde.</p>

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	<p><b>Tina Raleigh, Statkraft</b></p> <p>Tina is an experienced renewable energy expert with over 25 years’ experience in the sector. In her various roles she has amassed a wide and varied expertise in all aspects of environmental, infrastructural and energy projects, from inception, planning through to detailed project design and construction. She has advised on the development of over 1,000MW of onshore wind and solar projects. As Head of Offshore, she oversees the development of Statkraft’s Irish offshore wind portfolio – supporting Ireland to reach its target of having 5 gigawatts of offshore wind capacity by 2030. Tina is a Chartered Engineer with a degree in Civil and Environmental Engineering from University College Cork.</p>
Chapter 6 – Description of the Proposed Development (Offshore)	<p><b>Fiona Patterson, Nishikant Dash, Zak Henderson, Clodagh O’Donovan – Arup</b></p> <p>As above</p> <p><b>Anna Jamieson – Statkraft</b></p> <p>As above</p> <p><b>Erin Snaith – Statkraft</b></p> <p>MSc, BSc</p> <p>Erin is an EIA Manager with Statkraft with ten years experience working in the offshore wind sector. Key experience includes involvement in all stages of offshore wind farm development including: site selection feasibility studies and seabed leasing application support; consenting experience through contribution to EIAs and planning applications; and post consent compliance support including Ecological Clerk of Works (ECoW) on behalf of the developer and Environmental and Consent Due Diligence on behalf of Investors. Prior to joining Statkraft Erin worked as an environmental consultant supporting offshore wind farm developers, working as part of multi-disciplinary teams as both a project manager and providing technical input and advice on a number of marine disciplines.</p> <p>Erin holds an MSc in Marine Environmental Consultancy and a BSc in Marine Biology and Oceanography from Newcastle University.</p>
Appendix 6.2 – Rehabilitation Schedule	<p><b>Adam Pharaoh – APEX Environmental Consultants Ltd.</b></p> <p>MAppSc, BSc (Hons)</p> <p>Adam has over twenty years experience working as an environmental consultant, including the last fourteen years in the offshore wind sector. He has been the renewables sector lead for a major UK consultancy and has acted in various roles including project manager, technical specialist, project director and technical director across several offshore wind farms through the planning process, into construction and during operation &amp; maintenance. This has included several high-profile UK and non-UK offshore wind and coastal development projects, from site selection &amp; feasibility to environmental impact assessment, development of decommissioning programmes and the discharge of conditions post-consent. He oversaw the environmental impact assessment and habitats regulations assessment for the development of projects within the Dogger Bank Zone and continued to work on those projects as they were prepared for construction. He has recently completed the examination process for the Sheringham and Dudgeon Extension Projects (consented April 2024) and led on the development of the derogation case and compensatory measures.</p> <p>Adam has a background in marine biology and is a Chartered Environmentalist and Full Member of the Institute of Environmental Management and Assessment.</p>

Topic	Competency Summary
Chapter 7 – Description of the Proposed Development (Onshore) (including appendices)	<p><b>Fiona Patterson, Ian D’Arcy, Peter Mumford, Clodagh O’Donovan – Arup</b></p> <p>As above</p>
	<p><b>Shane Donohoe – Statkraft</b></p> <p>BE, MEngSc, PGradDip, CEng</p> <p>Shane is a Chartered Civil Engineer with over twenty years experience in Civil &amp; Structural Engineering Design, Civil Design for Power Transmission and Distribution and Project Management.</p> <p>Shane holds a degree and masters degree in Civil Engineering from University College Dublin as well as a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin.</p>
	<p><b>Hannah Mulcahy -Statkraft</b></p> <p>MPlan, BSc</p> <p>Hannah is a Project Manager with Statkraft and has 4 years’ experience working in the renewable energy sector. Relevant experience includes involvement in various stages of renewable energy project development, including site selection and feasibility, land acquisition, coordination of environmental surveys, preparation of consent applications, and stakeholder management. Prior to joining Statkraft, Hannah worked as a Graduate Planner in a private planning consultancy supporting in the preparation of planning applications for large scale Strategic Infrastructure Developments and Strategic Housing Developments in Ireland.</p>
Chapter 8 – Construction Strategy (Offshore)	<p><b>Fiona Patterson, Nishikant Dash, Zak Henderson, Clodagh O’Donovan – Arup</b></p> <p>As above</p>
	<p><b>Enda O’Doherty – Statkraft</b></p> <p>Enda is a Civil Engineer and has over 15 years experience in renewables projects, including onshore and offshore wind, and solar. assets. Prior to joining Statkraft, Enda was a Senior Consultant in Civil Engineering at K2 Management and worked predominantly on onshore and offshore wind projects supporting developers in Europe, United States and Asia. Enda’ s area of expertise is geotechnics and foundations, and supported projects on feasibility studies, consenting, financing, design, and execution.</p> <p>Enda holds a degree in Environmental Engineering from the National University of Ireland, Galway.</p>
Chapter 9 – Construction Strategy (Onshore)	<p><b>Fiona Patterson, Ian D’Arcy, Peter Mumford, Clodagh O’Donovan – Arup</b></p> <p>As above</p> <p><b>Shane Donohoe, Hannah Mulcahy – Statkraft</b></p> <p>As Above</p>

Topic	Competency Summary
Chapter 10 – Marine Geology, Oceanography and Physical Processes (including appendices)	<p><b>Bill Cooper – Cooper Marine Advisors</b> BSc</p> <p>Bill is Director of Cooper Marine Advisors with over 36 years’ experience in delivering technical studies focussed on estuary, coastal and offshore environments for wastewater, flood and coastal defences, ports and harbours, marine aggregates, marine renewable energy projects and offshore wind developments.</p> <p>He holds an honours degree (BSc.) in Oceanography from Swansea University (1986) and is a present member of the EPSRC peer review college.</p> <p>Bill has been involved in offshore wind projects since 1999 and has now supported more than 40 projects worldwide advising on metocean survey requirements, providing engineering design support, EIA input for marine and coastal processes (including drafting technical guidance for the industry) and acted as expert witness in several examinations.</p> <p>Bill has been involved in the NISA project since 2020 and is lead author for the marine processes chapter.</p> <hr/> <p><b>Jamie Hernon – MetOcean Works</b> BSc MSc MIMarEST CSci CMarSci</p> <p>Jamie is an expert oceanographer specialising in statistics, and numerical modelling of waves tides and sediments. Jamie has more than 15 years’ experience in the application of numerical modelling to complex oceanographic projects and regularly has a lead role in studies. In addition to modelling tides, waves and sediment transport processes, he has developed expertise in metocean analysis, weather downtime analysis and coastal flood risk issues.</p>
Chapter 11 – Marine Water and Sediment Quality (including appendices)	<p><b>Claire Hinton – GoBe Consultants Ltd</b> PhD, BSc</p> <p>Dr Claire Hinton has over 18 years experience in marine environmental consultancy, specifically in the field of physical processes and numerical modelling. Her technical experience has been applied to a wide range of sectors, including offshore renewables and Oil &amp; Gas. Of the former, she has been involved with Round 1 developments and the majority of Round 2 and 3 projects. Within the Oil &amp; Gas sector, she has contributed to licensing, development and decommissioning projects. For both sectors, she has had particular focus on Environmental Impact Assessments and associated requirements, providing in-depth physical processes assessments for proposed developments.</p> <p>As a Principal Consultant, Claire has acted as Project Director, Project Manager and Technical Expert for the projects she has been involved in. In addition to providing sound knowledge to commercial developments, she has also led and contributed to guidance for regulators and decision-makers. Her wide project experience has afforded her with the opportunity to work on projects from conception to operation and involved interaction with project teams, stakeholder and regulators.</p>

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	<p><b>Ailish Cobban – GoBe Consultants Ltd</b></p> <p>MSc, BSc</p> <p>Ailish joined GoBe in August 2022, having recently been awarded an MSc with Merit in International Marine Science from Heriot-Watt University. She completed her MSc dissertation in collaboration with GoBe Consultants, this dissertation was a review into select trace metal contaminants in the Humber region and possible impacts of this on past and future renewable energy developments. She brings technical capabilities in the fields of Water Framework Directive compliance assessments, and marine water and sediment quality to GoBe.</p> <p>Ailish is currently part of the project management team for the NE3 ScotWind site for the Stromar offshore windfarm, where she is the EIA, and Offshore Assistant Project Manager. This has involved coordination of various reports, liaising with clients / client engineering teams regarding surveys and fisheries engagement, and liaising with subcontractors.</p> <p>Ailish has also provided technical input to multiple projects PEIR and Environmental Statement reports, mainly in technical chapters and appendices relating to water quality. She has strong time management and communication skills which she draws upon to complete these technical tasks.</p> <p>During her undergraduate degree, Ailish obtained a comprehensive understanding and appreciation for the anthropogenic activities occurring in the marine environment, and the implications of this on marine ecology. During her postgraduate degree she gained a broader understanding of the oceanography of the marine environment, and marine spatial planning. These degrees allowed Ailish to build her data analysis skills (through the use of R, PRIMER, SPSS, and GIS), and gain some practical experience in marine conservation. This academic work also allowed Ailish to build on widely applicable skills, such as collecting and processing data, production of reports, and communication with a wide range of people from varying technical and academic backgrounds.</p>
<p>Chapter 12 – Benthic and Intertidal Ecology (including appendices)</p>	<p><b>Angela de Burgh – GoBe Consultants Ltd</b></p> <p>MSc, BSc</p> <p>Angela is an experienced marine ecologist and consultant who has a strong background providing scientific advice on the impacts of major industrial and construction developments in the marine environment. Angie has managed Ecological Impact Assessments, delivered a significant amount of technical chapters and co-ordinated a team of environmental consultants on a number of projects for industries including energy provision, aggregates and port and harbour development. Angela has also provided technical and marine policy advice to government departments and agencies such as Cefas, Natural England and the JNCC.</p> <p>Her experience includes the project management of post-consent compliance assistance for Rampion Offshore Windfarm and Galloper Offshore Windfarm, key involvement in the ecological impact assessments associated with 20 EIAs for marine aggregates licence renewals, the provision of expert advice to East Anglia Offshore Wind Ltd on mitigating construction impacts on Annex I habitats, leading the post-construction monitoring of benthic resources at Thanet Offshore Wind Farm and acting as an advisor to Tidal Lagoon Power during the preparation of the Terms of Reference for the benthic monitoring strategy for the Swansea Bay Tidal Lagoon.</p> <p>Angela also has specialist skills in survey design, multivariate statistical analysis of and interpretation of marine ecological data, habitat mapping, report writing and environmental impact assessment. Angela holds extensive ecological survey experience in</p>

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	<p>scientific benthic grab sampling, underwater video and imagery, epibenthic trawling and intertidal habitat monitoring. Beyond this Angela has a strong understanding of marine ecology, the legislation that regulates the environmental impacts of developments and how the impacts of different activities can be manifested.</p> <p>Angela has a fundamental understanding of Geographic Information Systems (GIS), having acted as the GIS technician on the Marine Aggregate Levy Sustainability Fund (MALSF) funded Regional Environmental Characterisation (REC) reports and leading a number of large scale intertidal habitat mapping projects as part of the government’s designation of Marine Protected Areas (MPAs) throughout the UK.</p> <p><b>Chris Niktik – GoBe Consultants Ltd</b> MSc, BSc</p> <p>Chris is a senior consultant with over 20 years experience as a marine ecologist, with specific expertise in benthic environments. He holds an honours degree (BSc) in Marine Biology, University of Newcastle upon Tyne (1988) and a masters degree (M.Sc) in Estuarine and Coastal Science and Management (University of Hull).</p> <p>Chris has extensive knowledge of the structure and functioning and benthic communities and has experience of a wide range of benthic habitats having lead numerous studies in marine and estuarine environments. He has been involved in planning and reporting of numerous benthic studies contributing to complex multidisciplinary projects, monitoring programmes and research and has authored over 50 technical reports and papers including marine ecology EIA chapters. Much of Chris’s work has been in support of power generation industry applications (Wylffa Power Station, Pembroke Power Station) and major infrastructure projects (Forth Replacement Crossing, North Wales Power Connection) where his responsibilities were as benthic ecology technical lead and technical author.</p> <p>Chris has been involved with the NISA project since May 2023 and is responsible for technical input into all benthic aspects of the project.</p>
Chapter 13 – Fish and Shellfish Ecology (including appendices)	<p><b>Anna Luff – GoBe Consultants Ltd</b> MSc Environmental Consultancy, BSc Natural History</p> <p>Anna is an Environmental Consultant with a background in natural history, and marine biology. She has experience in data analysis and management, undertaking literature reviews, rapid evidence assessments, report writing and GIS. Anna is currently working on progressing towards becoming an IEMA Practitioner.</p> <p>Anna has previous consultancy experience working for the Marine Biological Association, having worked on contracts for the JNCC, SNH and TECF (Tamar Estuaries Consultancy Forum).</p> <p>At GoBe Consultants, Anna is involved in EIA work for the Awel y Môr, Five Estuaries, Hornsea Four, Dublin Array, Greater Gabbard Extension and Rampion 2 Offshore Windfarms, writing Benthic and Intertidal Ecology and Fish and Shellfish Ecology scoping reports, technical reports, and EIA and PEIR chapters. Anna also has experience writing MCZ Assessments, MMMP documents and risk reports for the projects. She has also been involved in EIA work for the Area 481 Marine Licence application, writing PEIR chapters for the project. Anna has been involved in undertaking cable route and landfall appraisals for Round Four Leasing. Anna has also worked in post-consent compliance for the East Anglia Hub Offshore Windfarm projects as an Assistant Project Manager and has a current role as a Technical Advisor for the project.</p>

Topic	Competency Summary
	<p><b>Simone Pfeifer – GoBe Consultants Ltd</b></p> <p>PhD, MSc, Diploma Biology</p> <p>Simone is an experienced marine ecologist with specific knowledge of the diversity and structure of subtidal and deep-water benthic habitats and faunal assemblages. She also has a strong background providing advice on the impacts of industrial developments on marine receptors.</p> <p>Simone holds a German Diploma in Biology, University of Rostock (2002), a masters degree (MSc) in Marine Environmental Protection, University of Wales, Bangor (2006), and a PhD in deep-water ecology, University of Southampton (2022).</p> <p>In the past, Simone worked for the Joint Nature Conservation Committee, advising UK consenting authorities and developers on matters affecting nature conservation. She reviewed numerous scoping reports, EIAs, offshore survey specifications, and mitigation plans for offshore development proposals relating to marine aggregates, oil and gas, offshore wind, and sub-sea cabling. Simone has experience in conducting HRA screening assessments and advising developers on the risk of causing injury or disturbance to marine European Protected Species. She has also been involved in the development of sampling protocols for Annex I habitats and guidelines to assess impacts on features protected in Natura 2000 sites and UK Marine Conservation Zones.</p> <p>Simone has a broad range of analytical and technical skills. She is proficient in using GIS and has advanced knowledge of R for data management and analysis. Simone is also familiar with current EIA and HRA assessment approaches and relevant environmental legislations and policies. Simone has a strong interest in marine biodiversity and the application of management and conservation approaches to marine systems including habitat and species sensitivities, indicators of change, marine monitoring, and restoration measures.</p> <p>Simone has been involved in the NISA project since June 2023, contributing to the delivery of the Fish and Shellfish EIAR.</p>
<p>Chapter 14 – Marine Mammal and Megafauna Ecology (including appendices)</p>	<p><b>Rachel Sinclair – SMRU Consulting</b></p> <p>MRes, BSc</p> <p>Rachael holds a BSc (Hons) in Marine Biology from Aberdeen University (2010) and an MRes in Marine Mammal Science from the University of St Andrews (2011).</p> <p>Rachael is a Senior Scientist at SMRU Consulting Europe and has been with the company since September 2013. She leads the pre-consent offshore wind farm impact assessment team at SMRU Consulting Europe and has extensive experience in all stages of offshore wind farm consenting form, including: production of scoping reports, baseline characterisations, ES chapters, population modelling, MMMPs, input to Appropriate Assessments, stakeholder consultation, examination and attendance at issue specific hearings.</p> <p>Rachael has authored numerous marine mammal impact assessment chapters, including Hornsea Three and Four, Moray West, Seagreen Phase 1, Awel y Mor, Erebus, Five Estuaries, Outer Dowsing, Rampion 2 and Erebus, and is currently working on other projects in Ireland including Dublin Array and AFLOWT.</p> <p>Rachael has been working on NISA since 2021 and is leading the marine mammal impact assessment.</p>
<p>Chapter 15 – Offshore Ornithology (including appendices)</p>	<p><b>James Miles – GoBe Consultants Ltd</b></p> <p>PhD, MSc, BSc</p> <p>James is a Senior Consultant and lead ornithologist at GoBe with expertise in marine ornithology, marine mammal science and freshwater ecology. His main skills are in animal behaviour and technical assessments (e.g. statistical analysis, PVA modelling, collision risk modelling). During his</p>

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	<p>time at GoBe he has managed several large scale project EIA and HRA workstreams through all stages of pre-consent. His main expertise is in technical assessments and providing strategic advice to developers on all ornithological matters. He has also been involved in HRA derogation and compensation workstreams for many offshore windfarm projects across the UK and Ireland.</p> <p>As team lead, James' role primarily involves developing robust ornithological consenting strategies.</p> <p>He has a PhD in Sustainable Infrastructure Systems where he worked in freshwater ecology to mitigate the impacts of anthropogenic structures (e.g. hydropower) in rivers. His PhD was heavily based on quantifying animal behaviour, focusing on behavioural responses to visual cues. In previous roles James worked with the JNCC on a seabird bycatch project to develop population viability analysis (PVA) models to predict population responses to bycatch mitigation for ten UK seabirds.</p> <p>James has a broad range of analytical skills including advanced knowledge of R and MATLAB for data analysis and statistics as well as an extensive range of fieldwork experience</p> <hr/> <p><b>Freddie Leith – GoBe Consultants Ltd</b></p> <p>MSc, BSc</p> <p>Freddie is an Ornithological Consultant at GoBe Consultants Ltd, with skills in both seabird and marine mammal ecology. During his time at GoBe Freddie has been involved in several EIA and HRA workstreams, contributing towards technical assessments, document drafting and also compensation workstreams. He has also been involved in the provision of marine wildlife survey advice which he has developed a strong knowledge in through both his current role and previous work as a Marine Wildlife Analyst at APEM Ltd where he gained a specialist knowledge in digital aerial survey methodology.</p> <p>Through his previous work as a Research Assistant, Freddie has also undertaken seabird surveys for a range of projects and contributed to ornithological research both in the UK and overseas, gaining a strong understanding of survey design, project development and the delivery of effective scientific reports. Prior to this, Freddie graduated from the University of Exeter in 2021 with a Distinction in his MSc in Marine Vertebrate Ecology and Conservation, and with a 1st class BSc in Biological Sciences (Animal Biology) from the same university in 2020. During his MSc, Freddie specialised in seabirds, and published research looking at key demographic information in an endangered seabird species (the African penguin) to inform its effective management.</p>
Chapter 16 – Commercial Fisheries (including appendices)	<p><b>Fiona Nimmo – Poseidon Consulting Ltd</b></p> <p>BSc, BEng</p> <p>Fiona Nimmo, a resident of Edinburgh, Scotland, is a valuable member of the Poseidon team since 2010, bringing with her 15 years of expertise in marine and fisheries consultancy. Fiona holds a First Class Honours BSc (Hons) degree in Marine Biology from Newcastle University and a 2:1 Hons BEng (Hons) degree in Chemical Engineering from Edinburgh University, providing her with a strong and diverse scientific background. Her primary focus lies in the realm of commercial fisheries, specifically in strategic planning, industry management, and the intricate relationship between fisheries and the marine environment, both from a biological standpoint and in conjunction with other marine sectors, such as renewable energy.</p> <p>Fiona has successfully coordinated Environmental Impact Assessments (EIAs) for renewable energy projects involving wind and tidal developments. Additionally, she has conducted numerous technical assessments of commercial fisheries and natural fish resources for offshore</p>

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	<p>wind EIAs in various locations including Scotland, England, Wales, and Ireland. Fiona has also developed post-consent fisheries liaison and mitigation plans, as well as commercial fisheries monitoring strategies, as mandated by consent conditions.</p> <p>Fiona has extensive experience in leading every stage for the commercial fisheries elements of consent applications for nationally significant offshore wind farm projects in the UK. This includes projects in the North Sea (Near na Gaoithe, Hornsea One, Two, Three and Four; Dudgeon and Sheringham Shoal Extension Projects), the English Channel (Rampion 2) and the Irish Sea (Morecambe Offshore Wind Farm). Since 2010, Fiona has been engaged on Hornsea Projects on the east coast of England, where our expertise was brought to every stage of the consenting process involving scoping, fisheries liaison plan production, UK and European wide fishing industry consultation, Environmental Statement chapter and technical appendix preparation, development of Statements of Common Ground and acting as expert witness during examination process. Fiona is also engaged in providing equivalent services to a number of other newly identified and extension offshore wind farm projects in UK and Irish waters.</p> <p>In Irish waters, Fiona is currently providing commercial fisheries expertise to Dublin Array Offshore Wind Farm Project (RWE and Saorgus Energy) and Arklow Bank Wind Park Phase 2 (SSE Renewables), as well as NISA.</p> <p>Throughout her career, Fiona has consistently prioritized stakeholder consultation, engaging with statutory consultees, fishermen, and other stakeholders within the fisheries sector. She has also organized and facilitated public exhibitions focused on the fisheries sector.</p>
<p>Chapter 17 – Shipping and Navigation (including appendices)</p>	<p><b>Sam Westwood – Anatec</b> BSc. (Hons)</p> <p>Sam has 25 years’ experience within the maritime industry dealing with port and vessel operations as well as offshore installations. Her career started as a Deck Officer Cadet and after completing her NVQ in Merchant Vessel Operations she went on to gain a BSc. in Shipping Operations, a NEBOSH General Certificate in Health &amp; Safety and a Diploma in Small Craft Surveying. Sam has also developed maritime experience through a variety of roles within the industry including vessel operations in Rotterdam and Vessel Traffic Services in the port of Southampton whilst continuing to study at a post graduate level. Whilst working for the Maritime and Coastguard Agency within the Navigation Safety Branch, Sam gained a unique understanding of marine spatial planning including assessment of offshore developments and their impacts on marine navigation. Since joining the marine consultancy industry, Sam has been actively involved in the majority of offshore renewable projects in the UK, project in the US and European sites as well other offshore developments from both marine operations and HSE aspects. Sam has extensive experience in both pre and post consent developments including providing marine guidance to developers. Involvement to date includes acting as a marine navigation advisor for offshore developments, hazard assessments and workshops, spatial planning (cumulative, in combination and transboundary), individual site design, stakeholder management, post consent documentation (lighting and marking, navigational safety and vessel management) and mitigation strategies. Sam has managed and supported Navigational Safety Risk Assessments for several UK projects including East Anglia One, One North, Two and Three, Hornsea Project One, Two, Three and Four, Norfolk Vanguard and Norfolk Boreas, Moray West, Kincardine Offshore Wind Farm and the Dogger Bank projects including as representation at enquiries / hearings. Sam is also working on Round 4, ScotWind and Celtic Sea lease areas / awards. Other marine roles have included risk management, practical offshore HSE and the provision of QHSE documentation for offshore installations.</p> <p><b>James Milne – Anatec</b> BSc. (Hons)</p> <p>James has been involved in navigational risk in the marine sector for the last seven years, with experience primarily in the renewable energy industry, and specifically offshore wind farms. James’ work has included both pre and post consent related issues, from the site selection process through to the undertaking of the Environmental Impact Assessment (EIA) and Navigational Risk Assessment (NRA) for several large projects.</p>

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	<p>James has overseen and undertaken collision and allision risk modelling and participated in stakeholder consultation such as Hazard Workshops as part of the NRA process. Therefore, James is well acquainted with the consent process for offshore wind developments in Scottish, English and US waters. James also has experience with the post consent process and has assisted in the creation of various key documents for offshore installations. In addition, James is a member of Anatec’s internal Technical Team, who are tasked with undertaking research and development in relation to the various software which has been established by Anatec to allow quantitative risk assessment.</p>
<p>Chapter 18 – Offshore Archaeology and Cultural Heritage (including appendices)</p>	<p><b>Andrew Bicket – Wessex Archaeology</b>  BSc (Hons) MA PhD ACIfA</p> <p>Andrew is an experienced Geoarchaeologist and archaeological consultant with nearly 20 years’ experience in research and consultancy. His role as Senior Project Manager for Wessex Archaeology Coastal &amp; Marine includes the management and provision of specialist technical services, and consultancy across the full range of underwater cultural heritage environments whether they are located in freshwater, coastal, inter-tidal and marine contexts.</p> <p>Andrew has specialist knowledge of varied marine legislation and planning across the UK and Ireland and European waters more widely, relating to the marine historic environment. This has been demonstrated through the successful delivery of planning consultancy to a large number of large-scale developments over the last decade; including many major offshore wind, marine aggregates, ports and harbours and international interconnector cable projects.</p>
<p>Chapter 19 – Aviation and Radar (including appendices)</p>	<p><b>Simon McPherson – Cyrrus</b>  BEng (Hons)</p> <p>Simon has been working in the aviation sector for more than 30 years, including 20 years' experience as a flight inspector of airport and en-route navigation aids.</p> <p>At Cyrrus Simon is responsible for all aspects of aviation safeguarding, from studying the effects of proposed developments on an airport's operation to assessing the impact of wind farms on radar. He has provided advice to developers on the effects of proposed building programmes on navigation aids and offered possible mitigation solutions.</p> <p>Simon has provided aviation expertise for numerous wind farm projects, both onshore and offshore. This has included technical modelling of radar impacts and potential mitigations, the drafting of aviation chapters and technical appendices, and consultation with civilian and military aviation stakeholders.</p> <p><b>Peter Foulsham – Cyrrus</b></p> <p>Peter Foulsham has been involved in aviation for almost 40 years, first as an Air Traffic Controller (ATC) in both military and civilian roles, and the latter part of his career as an airline pilot. Peter has also spent time seconded to an aviation regulator as an ATC inspector and has served on an Air Accident Review Board for the regulator. Peter currently works as an Air Traffic Management (ATM) Consultant dealing with all aspects of aviation and airspace safeguarding.</p>
<p>Chapter 20 – Infrastructure and Other Users</p>	<p><b>Carleen Collier and Helen Millar – GoBe Consulting Ltd.</b>  As above</p>

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Chapter 21 – Land and Soils (includes soils, geology and hydrogeology)	<p><b>Marie Fleming – Arup</b> BSc (Hons) MSc DIC</p> <p>Marie is an Associate working in the Ground Engineering team in Arup and has a Bachelor of Science (Earth Sciences) honours degree from University College Cork and a Masters Degree in Engineering Geology from Imperial College London. Marie has over 20 years professional experience on large infrastructure projects and is a Professional Geologist (PGeo) with the Institute of Geologists of Ireland (IGI), a Chartered European Geologist (EurGeol) with the European Federation of Geologists and a Fellow of the Geological Society of London (GSL). She has prepared numerous Land, Soils, Geology &amp; Hydrogeology Impact Assessments for infrastructural developments including SSE Airtricity Arklow Bank Wind Park, Greenlink Interconnector and Galway City Ring Road.</p>
	<p><b>Gerry Baker – Arup</b> MSc, BA (Hons)</p> <p>Gerry is the project hydrogeologist and is an Associate working in the Ground Engineering team in Arup and has a Bachelor’s of Arts (Geography) honours degree from Trinity College Dublin (2000) and a Master’s Degree in Sustainable Management of the Water Environment from the University of Newcastle-Upon-Tyne (2001). Gerry has over 22 years professional experience on large infrastructure projects and is a Professional Geologist (PGeo) with the Institute of Geologists of Ireland (IGI) and a Chartered European Geologists (EurGeol) with the European Federation of Geologists. Gerry has prepared numerous Hydrogeology Impact Assessments for infrastructural developments including SSE Airtricity Arklow Bank Wind Park, Lough Talt RWSS (incl. IROPI process), Guinness Quarter Development, Uisce Éireann Lead Mitigation Plan.</p>
	<p><b>Rafaela Christ da Silva –Arup</b> BSc. Geology, MSc. Geology EM Hydrogeology.</p> <p>Rafaela Christ da Silva is a Senior Hydrogeologist in the Ground Engineering team in Arup and has a Bachelor in Geology from the UNISINOS (Brazil) and a Masters Degree in Geology EM Hydrogeology also from the UNISINOS (Brazil). Rafaela is a chartered hydrogeologist (PGeo) with the Institute of Geologists of Ireland (IGI) with over 7 years of experience as a geologist and a hydrogeologist. She has been working in numerous EIAR’s and highway projects through phases 1-4 and currently she has also worked in the Land, Soils, Geology &amp; Hydrogeology Impact Assessments for developments including IDL Midleton Capacity Expansion.</p>
	<p><b>Simon Kelly – Arup</b> MSc, BA (Hons)</p> <p>Simon is a Project Engineer working in the Ground Engineering team in Arup and has a Bachelor of Arts (Earth Sciences) honours degree from Trinity College Dublin (2020) and a Master of Science degree in Geophysical Hazards from University College London (2021). He is a member of the Institute of Geologists of Ireland (IGI) with two years’ experience with Arup. During his time at Arup, Simon has worked on a variety of projects across numerous geological environments. He has worked on several EIAR projects, ground investigations, and due diligence reviews.</p>

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Chapter 22 – Water	<p><b>Catherine Buckley – Arup</b> MSc, BA (Hons), PGeo, EFG</p> <p>Catherine Buckley is the Water team leader for Arup in Ireland, responsible for the co-ordination of 50 water professionals in the delivery of projects to private and public clients. She has 19 years’ experience working on major infrastructure projects across a number of sectors in both technical specialist and project/programme management roles.</p> <p>In addition, Catherine has authored national guidelines on these assessments, including the most recent version of ‘Road Drainage and the Water Environment’ for TII and is currently Chairing the working group updating the Institute of Geologists of Ireland EIAR guidelines.</p> <p>Catherine has completed the Arup University / Imperial College London Masters module in Business Economics. She also has a Bachelor’s Degree in Natural Science (Geology) from Trinity College Dublin and a Master’s Degree in Hydrogeology from the University of Leeds. She is a Professional Geologist with the Institute of Geologists of Ireland and is a recognised European Geologist (EurGeol) with the European Federation of Geologists (EFG). She was elected President of the Institute of Geologists of Ireland from 2017 - 2019.</p>
	<p><b>Ken Leahy – Arup</b> BE (hons), CEng</p> <p>Ken Leahy is a Chartered Civil and Environmental Engineer, Arup’s Ireland Water Business Leader and Europe Flood Resilience Leader and represents the Europe region on Arup’s Global Water Executive. He has over 25 years’ experience in leading and managing the successful delivery of high-profile multidisciplinary infrastructure projects, particularly flood relief schemes. He provides strategic advice to a number of state authorities and utility companies in the areas of flood risk assessment and management, climate change adaptation and resilience, engineering planning and environmental consultancy, H&amp;S and procurement.</p> <p>Ken is currently Project Director for a large portfolio of major flood relief projects, including three of Ireland’s major cities. He is Project Manager for the Lower Lee (Cork City) Flood Relief Scheme, the largest flood relief scheme to be implemented in Ireland.</p> <p>Ken was also Project Manager on the now successfully completed Mallow FRS and was co-author of a technical paper for Engineers Ireland entitled ‘The Design and Implementation of Mallow Flood Relief Scheme’, which was awarded the 2009 Engineers Ireland Engineering Excellence ‘MacDonald’ Award.</p> <p>Ken has been a regular guest lecturer at various third level institutes, as well as acting as an expert witness both at oral hearings and in litigation proceedings. He has presented on major flood relief schemes at national parliamentary level.</p>
	<p><b>Mesfin Desta – Arup</b> PhD, FIEI</p> <p>Mesfin Desta is a Principal Hydrologist with Arup and has over 17 years of experience as a hydrologist. He holds a PhD in Civil Engineering from UCD and MSc in Engineering Hydrology from NUI Galway. He is a chartered member and Fellow of Engineers Ireland. He was responsible for the preparation of Water / Hydrology Chapters of EIAR’s for various projects including Galway Bus Connect, N24 Waterford to Cahir, Sligo Greenway and the N25 Little Island Pedestrian and Cyclist Bridge.</p>

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Appendix 22.1 – Flood Risk Assessment	<p><b>Ken Leahy and Mesfin Desta – Arup</b> As above</p> <p><b>Rodoula Gregoriou - Arup</b> MEng, CEng ICE Rodoula Gregoriou has 11 years’ experience in flood risk management on a plethora of projects of varying scale and complexity. She has worked in several countries including UK, Ireland, India and Kenya assessing risk of flooding and designing flood risk management solutions. Rodoula has completed the Professional Diploma in Project Management by University College Dublin. She also has a Masters in Engineering Degree from Cardiff University. She is a Chartered Engineer with the Institute of Civil Engineers UK.</p>
Appendix 22.2 – Onshore Water Framework Directive Report	<p><b>Louise Lodenkemper – Arup</b> MSc, BSc, BSc (hons) Louise Lodenkemper is a Senior Scientist in the Water Group based in the Cork office. She has 10 years’ experience in integrated water resource management with a focus on nature-based solutions. Louise has experience as task leader developing basin plans and catchment management plans in Kenya, Uganda, Rwanda, Malawi and South Africa. She also developed erosion, sediment delivery and land use capability assessment tools as part of planning and has provided training in the use of QGIS and erosion modelling. She was the task leader in the development of a National Siltation Management Strategy for Dams in South Africa, and technical task leader for the development of a Water Fund in Malawi. She has also provided specialist input to environmental flow, geomorphological and wetland studies. She has the ability to represent landscape degradation spatially and quantify the current and future risk under climate change.</p>
Chapter 23 – Biodiversity (including appendices)	<p><b>Will Woodrow – Woodrow</b> MSc, MSc (Arch), MCIEEM, CEng Will is Divisional Director for Woodrow which is now part of the APEM Group. Will is an experienced ecologist with over 35 years of experience in ecological surveys and assessment. He worked with the RSPB in the UK, in different capacities between 1985 and 2001, including managing nature reserves, working as a Conservation Officer in the East Anglia Region and working in Head Office within the Reserves Ecology and Species and Habitat Policy teams. Will has been running his own consultancy since 2004 and has built up a large body of experience in the field of ecological impact assessment. Will has completed an HND in Conservation Management (1989), a MSc in European Environmental Policy &amp; Regulation at Lancaster University in 1994 and a MSc (Arch) in Advanced Environmental &amp; Energy Studies at the University of East London (2006). Will has had an overview role in this project and has reviewed the chapter.</p> <p><b>Maeve Maher-McWilliams – Woodrow</b> BSc MSc ACIEEM Maeve is a Principal Ecologist for Woodrow. Maeve has worked for over ten years on complex environmental impact assessments and mitigation design for development projects across Ireland, Northern Ireland and Scotland. Maeve has been involved in projects across several sectors such as</p>

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	<p>renewable energy; linear infrastructure; flood relief schemes and port developments; tourism and recreation; residential, pharmaceutical and data centre development. Providing advice and recommendations throughout project lifetime from inception and due diligence, right through the planning process and into post-planning compliance. As a project manager and field ecologist she carries out multidisciplinary surveys, habitat surveys, bat surveys, mammal surveys and specialises in ornithology surveys. She is also a skilled Ecological Clerk of Works. Maeve has been involved in the management of the project, reporting and review of the chapter.</p> <p><b>Julie Kohlstruck – Woodrow</b> BSc, MSc</p> <p>Julie Kohlstruck has worked as an Ecologist with Woodrow for three years and is part of the botany and habitat team with Woodrow. Julie has a BSc and MSc in Landscape Ecology, which she completed in 2020. A semester of the MSc was spent at NUI Galway where she studied models on European environmental legislation and its implementation in Irish law. Julie has carried out extensive vegetation and habitat surveys for research projects in Northern Germany, Central America and South America. In her current role at Woodrow, she is working on projects employing JNCC Phase 1, Fossitt and National Vegetation Classification (NVC) habitat classification survey techniques. In addition to her botanical identification skills, Julie has developed experience undertaking other ecological surveys including mammal, bat, amphibian and invertebrate surveys. Her abiotic skill set includes chemical analysis and pedological / geological mapping of soil and chemical and morphological quality assessment of waterbodies. Julie is currently applying for membership of CIEEM. Julie has undertaken fieldwork and has written sections of this chapter.</p> <p><b>Oisín O’Sullivan – Woodrow</b> BSc</p> <p>Oisín O’Sullivan is an Ecologist with Woodrow. Oisín has completed a BSc. in Ecology and Environmental Biology at University College Cork. His final year thesis involved bat surveys of urban habitats in Cork City. His work as a graduate ecologist with Woodrow was focused on bat data analysis including bat call identification and bat roost / habitat suitability surveys. Oisín has developed a high level of proficiency with Kaleidoscope, Ecobat and BatExplorer, all of which are analysis software used to assess bat calls and activity Since joining Woodrow, Oisín’s current work involves coordinating, surveying, analysing data, and writing summary bat activity reports for all onshore wind developments that Woodrow has worked on in the 2021 and 2022 survey seasons. This also involves the use of R to provide data on bat activity relative to weather conditions with the goal of informing curtailment as a mitigation measure. During 2022 Woodrow began undertaking offshore bat surveys including Oisín as a technical lead on these projects. These surveys involve the long-term recording of activity on islands and headlands to record migration events. Oisín is a Qualifying member of CIEEM and holds a license to survey bat roosts from the Department of Culture Heritage and the Gaeltacht. Oisín has undertaken fieldwork on this project and has written the bat sections of this chapter.</p> <p><b>Patrick Quinn – Woodrow</b> BSc (Hons), BSc</p> <p>Patrick Quinn has over 6 years’ experience in ecological consultancy. He specialises in freshwater ecology and Ecological Clerk of Works. Patrick has worked on a wide array of construction projects, including large scale wind farm construction, 110kV overhead transmission lines, roads and other infrastructure projects, including works within sensitive and designated areas (including Natura 2000 sites). He has a significant level of experience in aquatic ecology and monitoring include water treatment plants and water scheme infrastructure projects that require ecological supervision throughout Ireland. Patrick is an Associate member of CIEEM. He holds a BSc (Hons) in Environmental Science and a BSc in Environmental Protection, both obtained from Sligo Institute of Technology. Patrick has undertaken fieldwork on this project, and has written the aquatics sections of this chapter.</p>

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	<p><b>Emmeline Cosnett – Woodrow</b> BSc (Hons)</p> <p>Emmeline Cosnett is an ecologist and part of the botany and habitat team with Woodrow, who has worked in a variety of terrestrial and aquatic environments. She has carried out published research on independent botany / pollination ecology as well as two academic internships with Dr Dara Stanley’s Ecology lab NUIG, with a focus on agri-environmental schemes and botanical habitat surveys across Ireland. Emmeline has worked as part of the Eva Crane Project creating a pollen library of the Burren and is currently completing an accredited CIEEM MSc on Wildlife Biology and Conservation with Edinburgh Napier University. She has an BSc (Hons) in Environmental Science from NUI Galway (2018) with a focus on Botany and Entomology. Emmeline has excellent habitat classification skills at Phase 1, Fossitt and NVC levels as well as experience with mammal surveys, bird and bat surveys and with reporting requirements for clients. Emmeline has undertaken fieldwork on this project.</p> <hr/> <p><b>Aoife Hughes – Woodrow</b> MSc, BSc (Hons)</p> <p>Aoife Hughes is an Assistant Ecologist with Woodrow Sustainable Solutions. She has worked on a wide range of projects within Woodrow, including NIS, EcIAs, an EU Life Funding Application and various community projects. She has carried out various habitat and mammal surveys, with a specialist focus on botany. She completed a BSc (Hons) in Environmental Science at National University of Ireland, Galway. She was awarded the title of University Scholar for years one-three of her Environmental Science undergraduate course and graduated top of her class with a first-class honours degree. She is a graduate of a MSc by Research in University College Cork on how single-use plastics can be eliminated from the UCC campus. Aoife Hughes has undertaken fieldwork on this project.</p> <hr/> <p><b>Giulia Mazzotti – Woodrow</b> BSc</p> <p>Giulia Mazzotti is a Graduate Ecologist and Data Co-Ordinator with Woodrow Sustainable Solutions Ltd. She has completed a BSc. in Biological Sciences at University of Bologna and obtained full marks with honours (110/110 Cum Laude) in Ecology and Nature Conservation M.Sc. from University of Parma. During her studies she learnt to use R for data analysis and became proficient in the use of ArcGIS and QGIS for mapping. Since joining Woodrow Giulia developed experience undertaking ecological surveys including habitat mapping using Fossitt (2000) in ROI and Phase 1 classifications in NI, mammal, bat and invertebrate surveys. She also assists senior members of staff with GIS mapping activity and reporting for Ornithology Report, Ecological Impact Assessment (EcIA) and Biodiversity</p> <p>Chapters for Environmental Impact Assessment Reports (EIAR). Furthermore, Giulia took the lead of the H&amp;S of the company, producing risk assessments and RAMS, keeping track of all the new hazards, near misses and incidents related to fieldwork. She is a qualifying member of CIEEM. Giulia has been involved in the data collation, GIS and mapping.</p> <hr/> <p><b>Meadhbh Costigan – Woodrow</b> MSc, BA</p> <p>Meadhbh Costigan is an Assistant Ecologist with Woodrow. She graduated with a BA in Natural Science from Trinity College Dublin (2009) and an MSc in Ethnobotany from the University of Kent (2010). She has worked on conservation projects in Honduras, Canada, Switzerland, and Nepal (2010-2016). She and has also spent time working on organic farms in the west of Ireland (2017-2020) and more recently working for a tree planting charity (2021-2022) where she used the Biodiversity Metric to provide recommendations on habitat restoration as part of a local agri-</p>

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	<p>environmental scheme. Since joining Woodrow Sustainable Solutions, Meadhbh has gained experience in mapping (using ArcPro and QGIS), assisting in specialised marsh fritillary surveys, habitat identification according to Fossitt, carrying out desk studies (using data from the National Biodiversity Data Centre), and acting as the technical writer for Local Biodiversity Action Plans. She is a qualifying member of CIEEM. Meadhbh has written sections of this chapter.</p> <p><b>Patrick Power – Woodrow</b> BSc (Hons), BSc</p> <p>Patrick Power is a Graduate Ecologist with Woodrow Sustainable Solutions. He has obtained a BSc in Forestry and BSc (Hons) in Land Management in Forestry with Waterford Institute of Technology. He is currently studying an MSc in Wildlife Biology and Conservation. He has gained experience in different field survey methods, knowledge of Ecological Impact Assessments, and familiarity with the species and protected species of Ireland. During his time at Woodrow, he has been involved with the deployment of static detector surveys, the undertaking of bat transects surveys, currently training on bat roost inspections. Biodiversity checklist reporting and desktop studies. Patrick is a student member of CIEEM and has undertaken fieldwork on this project, and written sections of the chapter.</p>
Chapter 24 – Traffic and Transportation (including appendices)	<p><b>Gerna Van Jaarsveld – Arup</b> MSc</p> <p>Gerna is an Associate with Arup and has more than 25 years’ experience as a Transport Planner, of which she has spent over 10 years in Ireland. She holds a Town and Regional Planning degree with a masters in Transport Planning and has experience in delivering a wide range of transport planning projects in the public and private sector. She has prepared a number of Traffic Impact Assessments for Environmental Impact Assessments in Ireland including Arklow Wind Farm, Lower Lee Flood Relief Scheme, DART + Coastal North and the N25 Little Island Pedestrian and Cyclist Bridge.</p> <p><b>Laura Coughlan – Arup</b> MAI, BAI, BA</p> <p>Laura is a Design Engineer with Arup and has two years’ experience as a Transport Planner. Laura holds a Bachelor’s and Masters degree in Civil, Structural and Environmental Engineering. Laura is a member of Engineer’s Ireland and Transport Planning Society. She has assisted in the preparation of the Traffic Impact Assessments for the Environmental Impact Assessments in Ireland including Dart+ Coastal North, and Traffic Impact Assessments for site development.</p> <p><b>Shane Dunny – Arup</b> BAI, MA, MSc</p> <p>Shane is an Associate Director who leads the Transport Planning team. He holds a BAI, MA (Hons) in Civil, Structural and Environmental Engineering, Trinity College Dublin and a MSc (1st Class) in Civil &amp; Transport Engineering from Trinity College Dublin. Shane is a Chartered Engineer with nearly 20 years’ experience working in the areas of transport strategy and policy development, sustainable transport, transport economics, emerging mobility and the planning, appraisal, and delivery of major transport infrastructure throughout Europe, the US and Australia. He has worked on the planning, delivery and statutory processes for similar major infrastructure such as DART+, BusConnects, Luas extensions, major roads, transport technology and cycling infrastructure.</p>

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	<p><b>Liam Dunphy – Arup</b> MSc, BSc</p> <p>Liam is a Design Engineer with Arup and has over a years' experience as a Transport Planner. Liam has obtained a Bachelor's degree in City Planning and Environmental Policy and has also completed a Masters degree in Urban Design &amp; Planning. Liam has recently become a member of the Transport Planning Society. He has assisted in the preparation of the Traffic and Transportation chapter for Dart+ Coastal North, and has also assisted in the preparation of Traffic Impact Assessments for varying projects.</p>
Chapter 25 – Onshore Archaeology, Architectural and Cultural Heritage (including appendices)	<p><b>Faith Bailey – IAC</b> MA, BA (Hons)</p> <p>Faith is an Associate Director and Senior Archaeologist and Cultural Heritage Consultant with IAC Ltd. She holds an MA in Cultural Landscape Management (archaeology and built heritage) and a BA in single honours archaeology from the University of Wales, Lampeter. She is a licence eligible archaeologist, a member of the Chartered Institute of for Archaeologists, a member of the Institute of Archaeologists of Ireland and has over 17 years' experience working in the commercial archaeological and cultural heritage sector.</p>
Chapter 26 – Material Assets	<p><b>Fiona Patterson, Ian D’Arcy, Zak Henderson, Peter Mumford – Arup</b> As above</p>
Chapter 27 – Air Quality	<p><b>Sinead Whyte MSc CMIWEM, Arup</b></p> <p>Sinead Whyte is an Associate Director with Arup and has over 21 years' experience as an Environmental Consultant. She holds a MSc in Experimental Physics and is Chartered for over 15 years with the Institute of Water and Environmental Management. She has been involved in environmental assessments of numerous developments including DART Underground, M20 Cork to Limerick Motorway, M7 Osberstown Interchange and R407 Sallins Bypass and N9/N10 Kilcullen to Powerstown. Sinead presented expert witness evidence at the An Bord Pleanála oral hearings into these developments.</p>
Chapter 28 – Climate	<p><b>Sinead Whyte – Arup</b> As above</p>
Chapter 29 – Seascape, Landscape and Visual (including appendices)	<p><b>Richard Barker – Macroworks</b> MLA, PG Diploma Forestry, BA</p> <p>Richard has spent the over 20 years working as a Landscape Architect in Ireland and has considerable experience in the fields of both Landscape and Visual Impact Assessment (LVIA) and landscape design, covering all stages from project feasibility through to construction. Richard has personally completed the landscape and visual assessment of over 90 wind farms and 80 solar farms including nine SID projects. Consequently, he has considerable oral hearing expert witness experience. This extends to more than 15 oral hearings with four of these being for large SID wind farm projects.</p> <p>Richard has presented a number of conference papers relating to sustainable landscape design and LVIA as well as delivering the inaugural workshop on the landscape and visual effects of wind energy developments on behalf of the Irish Wind Energy Association. He has presented a</p>

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	<p>paper to members of the Irish Landscape Institute on the application of the Guidelines for Landscape and Visual Impact Assessment (2013) using a wind energy case study. Richard has also delivered guest lectures to the University College Dublin professional course in EIA Management in relation to LVIA.</p>
<p>Chapter 30 – Noise and Vibration</p>	<p><b>Sinead Whyte – Arup</b> As above</p>
	<p><b>Mhairi Riddet – Arup</b> BSc, MSc, MIOA Mhairi Riddet is an experienced acoustic consultant, with over 5 years of specialist experience, and over 10 years of general project experience. She holds an MSc in Acoustic Engineering and is a Member of the Institute of Acoustics. Mhairi has prepared numerous acoustic assessments for planning purposes, both in Ireland and Australia, and has experience assessing noise for many different purposes.</p>
	<p><b>Peter Mumford – Arup</b> As above</p>
	<p><b>Dean Redmond BSc – Arup</b> Dean Redmond is a Graduate Acoustician with Arup. He holds a BSc in Physics from University College Dublin. He has previously worked on noise and vibration assessments for infrastructural developments, industrial developments and commercial developments including DART+ Coastal North, The N25 Little Island Pedestrian &amp; Cyclist Bridge EIAR, IDL Midleton distillery expansion EIAR, Irish Cement noise improvements for EPA licencing along with several due diligence assessments for confidential clients for work on data centres. Dean assisted Mhairi Riddet in preparing Chapter 30 of this EIAR.</p>
<p>Chapter 31- Resource and Waste Management (including appendices)</p>	<p><b>Janet Lynch BEng, MCTWM, MIEI CEng, Arup</b> Janet Lynch is an Associate with Arup with over 17 years’ experience in Industrial Emissions licensing, EIA and planning including, Resource and Waste Management: Construction and operational waste management plans, Energy from Waste, waste re-use, recycling and landfill, Innovative waste treatment technologies; Planning and EIA project management (energy, renewables, industrial, infrastructure); Industrial Emissions (IE) License applications &amp; review (waste, biomass, oil and gas, energy, cement, pharmaceutical); Circular Economy; Water: Tender Assessments for Irish Water and Dublin City Council; Assistant Project Manager for the expansion of Irelands largest water treatment plant at Ballymore Eustace, Co. Kildare in 2006. Janet holds an honours degree in Civil and Environmental Engineering from University College Cork, a FETAC Certificate in Waste Facility Management and a Certificate in Applied Project Management from the IEI and University Limerick. She is a Chartered member of the Chartered Institution of Wastes Management (MCTWM) and a Chartered Member of Engineers Ireland</p>
	<p><b>Simon Grennan, BA (Mod.), MSc, Arup</b> Simon Grennan is a Senior Environmental Consultant with Arup and has over 9 years’ experience in the environmental sector. Simon holds an MSc in environmental Sciences from Trinity College Dublin. Simon has a wide range of experience in the environmental field, with specific experience in EIA coordination and preparation and waste management consultancy work. Simon has significant experience working on construction and</p>

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	<p>demolition resource and waste management plans, operational waste management plans and resource and waste management EIAR chapters for projects across a range of sectors. Example projects include the Dart+ Coastal North EIAR, the N25 Little Island Pedestrian and Cyclist Bridge EIAR, the IDL Midleton distillery expansion EIAR and the Guinness Quarter EIAR.</p> <p><b>Zak Henderson – Arup</b> As above</p>
Chapter 32 – Population and Human Health	<p><b>Jenny Dunwoody - Arup</b> BSC (Hons), PG Dip, Chartered Environmentalist</p> <p>Jenny has over 20 years’ experience in environmental consulting with a strong focus on health impact assessment, as well as extensive experience in EIA and SEA. She has led health assessments for major national infrastructure projects including the High Speed 2 railway, Luton Airport Expansion and the A66 Northern Trans-Pennine highway project. She has experience of supporting Public Examinations, including acting as an expert witness. She has been involved in the development of health assessment guidance for IEMA and is currently leading the production of a Population and Human Health Assessment Standard for Transport Infrastructure Ireland.</p>
Appendix 32.1 EMF Study	<p><b>John McAuley – Compliance Engineering Ireland Ltd</b> CEng, BSc, MSc, MIEI, MIEEE</p> <p>John is an electronics engineer with a master’s degree in Electrical and Electronics Engineering. He obtained Chartered Engineer status with Engineers Ireland in 2013. John has over thirty years' experience providing consultancy on the electromagnetic fields (EMF) aspects of major power projects. He is Managing Director of CEI Ltd which is the only ISO accredited electrical test laboratory in Ireland. His experience includes advising on technical issues, European and Irish EMF legislation and computer modelling of EMF sources. This experience has been gained on major energy infrastructure projects, both onshore and offshore including the North South Interconnector, East West Interconnector, Greenlink HVDC and the Celtic Interconnector. He has written the EMF contribution to a large number of wind farm projects, onshore and offshore power lines and radiofrequency transmitters. He is chairman of the NSAI electrotechnical standardisation committee which has twenty technical committees covering EMF, EMC and electrical safety which produces the Irish national wiring rules.</p> <p><b>Niall McAuley – Compliance Engineering Ltd</b> MEng, MIEEE</p> <p>Niall is an Electronics Engineer with a Master’s degree in Electrical and Electronics Engineering from Queen’s University Belfast. He is also a Member of the IEEE and the IEEE EMC Society. Niall is currently an EMC test facility manager and EMF Consultant for Compliance Engineering Ltd where he has worked since his graduation in 2020.</p> <p>He has worked on a wide range of EMF consultancy projects across the world including Ireland, UK, Denmark, France, USA. This experience includes numerous large scale, nationally recognised projects for globally recognised clients concerning assets such as undersea power cables, land based power cables and train infrastructure including signalling. The services provided by Niall included, assessment of critical assets and scope of interest, assessment of electromagnetic environment requirements with reference to relevant standards, modelling of expected electromagnetic environment and design and consultancy on mitigation measures. This has also included the implementation and verification of mitigation measures.</p>

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Chapter 33 – Socio-Economic, Tourism and Recreation	<p><b>Helen Reid – Arup</b> MSc, BSc (Hons)</p> <p>Helen is a highly experienced policy planner/economist and project manager with an extensive background in producing high quality technical guidance and advice for both the public and private sector. Helen has worked on a vast range of socio-economic and economic impact assessments in her current and previous roles. She has worked on providing economic impact analysis on a number of potential hydrogen plants, analysing key economic indicators such as jobs and GVA, skills and supply chain impacts. She also co-leads the socio-economic and research work area, working closely with Arup’s City Planning and Regeneration and City Economics Teams.</p>
	<p><b>Manasi Lohumi – Arup</b> MSc (Transport Economics), MSc (Financial Economics), BA (hons)</p> <p>Manasi is a Consultant within Arup’s City Economics team in London. With a robust background in the transport industry, her expertise encompasses analytical research, data collection &amp; analysis, and economic appraisals for infrastructure projects. Within Arup, Manasi has built a strong quantitative data analysis and excel modelling capabilities. She has worked on the Cost Benefit analysis, socio-economic baseline and impact assessment of several infrastructure business cases in the UK and internationally both.</p>
	<p><b>Zak Henderson – Arup</b> As above</p>
Chapter 34 – Major Accidents and Disasters	<p><b>Fiona Patterson, Debbie Flynn, Zak Henderson, Peter Mumford – Arup</b> As above</p> <p><b>David Longworth – Statkraft</b> MSc Eng, BSc, NCRQ DiP, NEBOSH.</p> <p>David is a Health and Safety Manager with over 10 years’ experience in Health and Safety and over 20 years in the Marine Sector. Prior to joining Statkraft David worked across Europe supporting the development and deployment of renewables with various international renewable energy companies.</p> <p>Key experiences are in daily operation of the Onshore Renewable and Offshore health and Safety as well as development of IPPC systems, COMAH and Emergency Response processes. David holds a MSc in Environmental Engineering from Trinity College Dublin, a BSc in Engineering Technology from University College Dublin as well as a number of Health and Safety and Marine specific courses and experiences.</p>
Chapter 35 – Offshore Bats	<p><b>Jason Guile – Apem Ltd</b></p> <p>Jason is an ecologist with over 11 years’ experience in the ecological sector in both the UK and Ireland. His skills include and extensive knowledge of planning environmental law and planning requirements for ecology and biodiversity. Jason is a qualified ecologist experienced in ecological survey techniques and methodology including mammals,. Bats, reptiles, amphibians and habitats, mitigation design, Appropriate Assessment and Ecological Impact Assessment. He has extensive experience of project management and is responsible for coordinating both internal an external surveyors across numerous projects in his current and previous roles. Jason has completed Ecological Impact Assessments (EcIA), Environmental Impact Assessment Reports (EIAR) and Appropriate Assessments for a wide variety of projects in Ireland and the UK. He has considerable</p>

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	<p>experience of EIAR and ecological constraints work, which often includes extensive reference to, and interpretation of, Article 6 of ‘The Habitats Directive’, and to other EU, UK and Irish conservation legislation. Jason has a full understanding of recent CJEU case law pertaining to Appropriate Assessment and EIAR and has practical experience of its application. Jason can foresee the potential impediments that recent case law could bring to the development of a scheme and can therefore de-risk the project throughout constraints assessment and design.</p> <p><b>Will Woodrow – Woodrow</b> As above</p>
Chapter 36 – Mitigation, Monitoring and Residual Effects	<p><b>Fiona Patterson, Peter Mumford– Arup</b> As above</p>
Chapter 37 – Transboundary and Inter-Related Effects	<p><b>Fiona Patterson, Zak Henderson – Arup</b> As above</p>
Chapter 38 – Cumulative and Inter-Related Effects	<p><b>Fiona Patterson, Debbie Flynn – Arup</b> As above</p> <p><b>Alexandra Fleming – Arup</b> MSc, BSc, MCIWEM, C.WEM Alexandra is an experienced Environmental Consultant with over 9 years experience working on EIARs in a number of areas including industrial, manufacturing, strategic housing developments, commercial developments and flood defence schemes.</p>