

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

## **Environmental Impact Assessment Report Development at Waterford Airport**

**Volume 3 – Appendices** 

Prepared for: Waterford City & County Council in Partnership with Waterford Regional Airport PLC





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# APPENDIX 1-1

Curriculum Vitae of Contributors





## **Jim Hughes** Director of Energy & Planning



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

#### Profile

Jim Hughes has a BA in Public Administration (Development) from the University of Limerick, a Masters in Town Planning from Queens University Belfast and a Diploma in EIA/SEA Management from University College Dublin. Jim is also a member of the Irish Planning Institute.

Jim is a Qualified Town Planner with over 15 years post qualification planning experience in both the private and public sector. He has extensive experience in providing strategic level advice to clients and negotiating with and presenting to local authorities. Jim has experience in the management and coordination and the preparation of planning applications, masterplans and Environmental Impact Statements for mixed use schemes and renewable energy projects throughout Ireland. He also has experience in the preparation of retail impact studies, planning appeals, Section 5 declaration applications and zoning submissions. Jim has represented clients on planning enforcement matters and as expert witness at oral hearings. He is also experienced in peer review and preparation of independent planning assessments and appraisals on behalf of clients. Jim has also experience in delivering seminars to the Financial Sector on planning matters on the importance of protecting the planning asset.

#### **Key Skills**

Jim experience includes:

- Lead planning consultant on the Dunkettle Interchange Road Project
- Over 15 years as an IPI accredited Town Planner
- Acted as expert witness at ABP Oral Hearings and in Judicial Review Hearings and High Court Cases.

#### **Previous Experience Essentials For This Project**

#### 2019

- Project Director on the Kipaddogue Peaking Plant ancillary grid infrastructure development, Co. Kerry. Planning Strategy and Environmental Report
- Project Director on a 12 wind turbine development in Co. Kildare, Drehid Wind Farm.
- Project Director on the carrying out of masterplan and feasibility assessment on brownfield industrial sites in Nenagh and Roscrea on behalf of Zinc Properties
- Project Director on up to 10 Solar Farms
- Portfolio management of Shannon Commercial Properties portfolio of properties in mid-west region, including planning appraisals, zoning submissions and masterplan
- Project Manager for Croaghaun Wind Farm.

#### 2018

- Project Manager for Coom Green Energy Park EIAR
- Planning Lead on the South Kerry Greenway EIAR
- Project Director on Kilbarry Residential Development, consisting of 800-unit residential scheme
- Project Director on 19 no. unit residential development, Cork South Docklands
- Project Director 100-unit Roxborough Residential Scheme, Co. Wexford
- Project Director 100-unit Bettystown Residential Scheme, Co. Meath.
   www.fehilytimoney.ie

#### **Key Information**

#### Qualifications

BA in Public Administration (Development), University of Limerick (2002)

> MSc. Town Planning, Queens University Belfast (2004)

Diploma in EIA/SEA Management, University College Dublin (2008)

#### **Professional Memberships**

Member of the Irish Planning Institute

#### Employment History 2015- Present

Fehily Timoney & Company Associate Director

#### 2007 – 2015

Cunnane Stratton Reynolds (SCR) Senior Planner

#### 2004 - 2007

Cork County Council Area Planner



## Jim Hughes Director of Energy & Planning



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

- Project Director 300 unit Enniscorthy Residential Scheme, Co. Wexford
- Project Director for Derrysallagh Wind Farm EIA.

#### 2017

- Review of Strategic Environmental Assessment and Appropriate Assessment for the nationwide Catchment Flood Risk Assessment and Management Plans
- SEA Screening for the Bandon Transportation and Public Realm Enhancement Plan
- Provision of planning advice on substitute consent applications for wind farm, Derrysallagh Wind Farm
- Provision of planning advice on the successful Maighne Wind Farm Judicial Review
- Provision of planning advice on the preparation of an EIA for the Raragh Wind Farm cable route planning application
- Project management of Moanvane Wind Farm proposal, Co. Offaly.

#### 2016

- Preparation of and SEA and AA in conjunction with CAAS Ltd. of the Wind Energy Strategy for Co. Tipperary 2016
- Project Management of Castletownmoore Wind Farm SID application Co. Meath
- Project Director on the preparation of approximately 20 no. solar farm planning applications nationwide
- Preparation and coordination of planning application for 50 no. dwelling units in Croom Co. Cork
- Planning Advice and negotiation for a 49,000 tonne Metal Recycling Facility, Limerick
- Planning advice on the Derragh Wind Farm Judicial Review
- Preparation of an integrated tourism masterplan for tourism site on the banks of the River Shannon Co. Clare
- Preparation and submission of planning application for a recreation facility at the old Burlington Plan, Co. Clare
- Development Plan submissions and retained Planning Consultant for Shannon commercial Properties, provide planning advise and strategy for the management of portfolio of property in the mid-west region.

#### 2015

- Management and coordination of a design team for An Bord Pleanála Oral Hearing in Cork for a mixed-use Retail Development, Ballyvolane, Co. Cork
- EIS, RIA and planning application for a mixed-use District Centre Development, Cork
- Project Manager Ardglass Wind Farm, Co. Cork.

#### 2008 - 2014

- SID Pre-Planning consultation with An Bord Pleanála for a Local Authority Marina development in Cork
- Strategic Review of Dursey Island and Cable Car. In conjunction with AECOM and TDI, an overall economic and tourism development strategy was developed for Dursey Island
- Development Plan Monitoring and submissions on behalf of a large international Financial Institution
- EIS, RIA and planning application for a mixed-use retail development, Clonmel
- Feasibility Assessment for Waste to Energy facility, Co. Clare
- Co-ordinating a multi-disciplined team; contributed to EIS and planning submission for the regeneration of the south-western
  docklands area of Waterford City. The scheme consisted of 11 no. development blocks ranging in height from one floor to thirty
  floors over basement level
- Coordinated a multi-disciplined team of 5 Architects and preparation of EIS and planning submission for the regeneration of the south docklands area of Cork City. The proposed development was the largest planning application ever to be lodged with Cork City Council. 2007
- Coordinated the lodging of a planning application, contributed to EIA and response to Third Party appeal for a mixed-use development consisting of retail, commercial, residential, tourism, leisure development, Waterford City
- Contribute to EIA for Road and Bridge Infrastructure for Cork City Council including preparation of a scoping document and public consultations.



## **David Moore** Planning/Foreshore Consultant



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

#### Profile

David is a Senior Planner with Fehily Timoney and Company and is responsible for planning and environmental inputs to large scale project activity within the company.

David has over 20 years' experience in the planning and development sector within private, public and academic contexts. He has gained extensive project management experience in complex, multi-party projects at national and international scales.

David holds honours degrees at Bachelor and Masters level in Geography, a Masters degree in Business Administration and Master of Science Degree in Spatial Planning. In 2017 David was awarded a Higher Diploma in Planning and Environmental Law by the Honorable Society of King's Inns which provides him with a strong understanding of current planning legislation and court rulings.

David's planning experience embraces all aspects of development control, strategic and regional planning, together with co-ordination of multi-disciplinary teams. David has provided strategic planning advice on large scale renewable energy, infrastructure, residential, commercial and retail development.

He has provided expertise in development plan preparation, development plan submissions and expert witness services for oral hearings, arbitration and court cases. David is an experienced Project Manager and has EIAR Coordinator to energy, aviation and residential projects. David has acted on behalf of project promoters and other interested stakeholders and has led a number of public engagement programmes. Over his career David has also acted as lead for IT, Data Management and GIS activity into planning and resource management projects.

#### **Key Skills**

David has experience across a broad range of planning expertise embracing:

- Experience in planning and development practice for renewable energy, residential, commercial and infrastructure, sectors.
- Specialist expertise in solar PV planning and layout design.
- Management of large-scale planning applications and consent process including strategic infrastructure development, substitute consent and 'Part 8' applications.
- Preparation of planning and development strategies including feasibility studies, risk management strategies, due diligence and compliance reports.
- Coordination of multi-disciplinary teams for large scale development projects including design management, Environmental Impact Assessment Reports (EIAR) and Appropriate Assessment (AA).
- Preparation of planning reports, planning appeals, development plan submissions, 'section 5' requests and referrals, and legal submissions/affidavits.
- Specialist understanding of planning compliance and enforcement issues.
- Experience in oral hearings, CPO arbitration hearings, court hearings and presentations to stakeholders, local authority elected members and officials.
- Technical skills in urban design, rural development, development plan preparation, SEA, EIA and AA, retail impact, landscape and visual assessment, GIS and data management, renewable energy technology, demographics and socio-economic analysis.

#### **Previous Experience Essentials**

#### Residential and Mixed Use Development:

- Planning and design advice and submission of successful planning applications, including part V submissions, relevant recent projects include:
- Kilbarry, Co. Waterford. Masterplan input and planning permission for 190 no residential units in two phases and EIAR coordinator and project manager for additional phases to provide up to 800 residential units. (Kilbarry Developments, 2019)

#### **Key Information**

#### Qualifications

Higher Diploma in Planning and Environmental Law, The Honorable Society of King's Inns, 2017

MSc. Spatial Planning, Dublin Institute of Technology, 2006

Masters in Business Administration, Open University, UK, 2002

Masters of Arts (Geography with GIS), University College Dublin 1991

Bachelor of Arts (Archaeology & Geography) 1988

#### **Professional Memberships**

Irish Planning Institute (Corporate Member, Elected Chairman of the Cork IPI Branch, 2011/12)

MBA Association of Ireland (Member of Southern Branch Committee 2011)

IRLOGI (Irish GIS and Geo-data Umbrella organisation member since 1996)

#### Employment History

2013- Present Fehily Timoney & Company

2003 – 2013 Spatial Planning Solutions Ltd.

2001 – 2003 McCutcheon Hogan, Planning Consultants, Cork

**1998 – 2001** EUROGISE Project, National University of Ireland, Galway

**1996 – 1998** CSA Computing, Dundrum Business Park, Dundrum

**1992 – 1996** Kevin Cullen & Company (NGIS), Environmental Consultants, Dublin



## **David Moore** Planning/Foreshore Consultant



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

- Victoria Road, Cork City. Planning lead and PM for grant of planning permission for two 10 storey blocks to provide for 19 apartments and mixed uses at Cork South Docks, (Target Ark, 2018)
- Rocksborough, Co. Wexford. Planning permission for 140 units in 2 phases, including substantial provision of social houses. David was project manager for the application and FI response (Marrow Point Properties, 2018).
- Proposals for Social Housing to Clúid Housing. Preparation of a proposal and planning assessment for provision of 48 no. social housing units (for Nova Connect 2017)

#### • Retail and Commercial:

Preparation and submission of planning applications, Lidl Stores, Bantry, Co. Cork (€2 million, 2009, constructed); Tramore, Co. Waterford (€3 million 2010, complete to planning permission); Ferrybank, Co. Kilkenny (€2 million, 2009, constructed); Hardware and Garden Centre, Listowel, Co. Kerry (private client, €1.5 million, complete to planning permission 2008).

Due diligence for supermarkets and retail outlets at Clonmel, Co. Tipperary and Thomastown, Co. Kilkenny, €12 million, Musgraves Group (2013/15). Advice and developer representative for enforcement proceedings for Scoil Mhuire, Cork (2014/15).

#### Development Plans, Policy and Guidance:

#### Statutory Plans:

- Askeaton Local Area Plan (2009 2015), Co. Limerick for Limerick County Council. David was responsible for analysis and policy input for landuse, population and housing and compilation of demographic, heritage, and transport information for the plan. This plan was undertaken in association Brendan McGrath & Associates (2008).
- Woodstock Local Area Plan (2008—2014), for Kilkenny County Council, including landscape character assessment, heritage policy and walking route assessment with visualisations for pubic consultation. This plan was undertaken in association Brendan McGrath & Associates. (2007)
- Galway Settlement Strategy, Galway County Council (2003) including assessment of existing housing provision, compliance with Galway City Council policy and identification of growth areas as part of the preparation for the Galway County Development Plan. David was responsible for plan coordination and undertook demographic analysis and identification of settlement hierarchy and policy.

Development Plan Submissions:

- Strategic Tourism Development strategy Kilmore Quay, Co. Wexford, submission to Wexford County development Plan Review for Nova Connect (2018)
- Settlement Boundary extension and re-zoning at Blarney, Co Cork, including tourism & heritage impact and coordination of urban design proposals (2011).
- Re-zoning and modifications of settlement strategy for student accommodation at Ringaskiddy co. Cork, (2007 & 2010)
- Housing supply and accommodation requirements for Cork County CASP area, (for O'Flynn Construction, 2005).

#### • Transport & Mobility:

Waterford Airport: Lead planning consultant and EIA coordinator for runway extension (2018). South Kerry Greenway: team input on policy and human impacts for EIAR (2018). Dublin Airport: Planning consultant and coordinator of supporting documents on confirmation of planning exemption of proposed works (2017). Lead researcher and PM for national survey and spatial analysis of the Irish ambulance service (PHECC, 2004 to 2006).

#### • Solar Energy:

Coordination, design review, and preparation of planning reports, EIA Screening and planning applications for over 15 no. utility scale solar energy developments in counties Cork, Clare, Kildare, Longford, Louth, Westmeath and Wexford; preparation of over 45 no. Planning Feasibility for solar projects nationally. Preparation of Further Information Requests and first party Appeals for solar projects. Submissions to the ISEA Solar Energy Guidelines. Design activity included specification of mitigation measures, compliance with road building and development standards, position of key site infrastructure and site access provisions. Leading of public consultation programme for a number of solar planning applications.

#### • Wind Energy:

Compliance and statutory regulation requirements for turbine provisions at including EIAR and AA (Stage 1) coordination Barranafaddock Wind Farm, Co. Waterford for StatKraft (2019). EIAR reviewer and public consultant attendance for Coom Green Energy Park, Co. Cork (Brookfield Renewable 2019). Planning advice and strategy preparation for re-powering of existing wind energy projects (Blackrock 2019). Compliance consents for turbine regularisation at Coomacheo, Wind Farm Co. Cork & Co. Kerry for SSE and Lagan Construction (2015), Planning advice, Emlagh Wind Farm, Co. Meath Oral Hearing (Element Power 2014 – 2015); Planning advisor Maighne Wind Farm (47 no. Turbines) (Element Power 2015); Compliance advice on landscape and residential amenity impacts at Knockacummer Wind Farm, Co. Cork (Private client).

#### • Marine Infrastructure:

Submission of planning applications for 9 no. locations associated with landing and passenger infrastructure of a fast-ferry passenger service in Cork Harbour for Harbour Cat Ferries Ltd. This included preliminary site assessment for at 28 sites around Cork Harbour, and engagement with Department of Marine on Foreshore Licenses (2008 – 2009).

#### • Strategic Environmental Assessment:

Review of OPW Flood Risk Management Plans – review of analysis and policy input (2018). Strategic Environmental Assessment for Draft Buncranna and Environs Development Plan (2007) Donegal County Council, landscape and zoning policy analysis for assessment of the draft Development Plan, in association with Brendan McGrath & Associates, (2007)



## **Dr. Elaine Bennett**

Senior Scientist



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

#### Profile

Elaine Bennett is a Senior Scientist and Project Manager with Fehily Timoney. Elaine has a PhD in Plant Ecology and BSc. in Biological Science from University College Cork and a Diploma in Environmental Impact Assessment. Elaine works in the Environment and Energy Department of Fehily Timoney and is experienced in project managing and coordination of Environmental Impact Assessment Reports, Environmental Reports, Ecological Assessments and Appropriate Assessments.

Elaine has excellent experience in the identification of constraints to development and the production of high quality planning applications and associated documentation for environmentally sustainable and buildable infrastructure projects.

#### **Key Skills**

- Project Management
- Environmental Impact Assessment Reports
- Environmental Reports
- Ecological Assessments
- Appropriate Assessments

#### **Previous Experience – EIAR and Planning Applications**

- N19 Shannon Airport Access Road (Clare County Council/TII) (2019 ongoing). Environmental Lead for the constraints, route selection and EIAR for the proposed upgrade to the access road to Shannon Airport.
- **Derryville Anaerobic Digestor EIAR (DES Ltd.) (2020-ongoing).** Project Manager and EIAR coordinator for the planning application for upgrades to an existing facility at Derryville, Co. Tipperary.
- Dernacart Wind Farm (Statkraft) (2019 ongoing). Project Manager and EIA coordinator for the EIAR, NIS and planning application for the proposed Dernacart Wind Farm. This application consists of eight turbines with a tip height of up to 185m, near Mountmellick in Co. Laois. The proposed development also includes access tracks, substation, temporary compounds, MV and HV cabling as well as minor alterations to the public toad for the delivery of turbines.

Drehid Wind Farm (Statkraft) (Ongoing – FI Stage)

Project manager and coordinator for the EIAR for the proposed Drehid wind farm. This application comprised of 12 turbines with a tip height of up to 169m, near Johnstown Bridge, Co. Kildare. The proposed development also includes access tracks, substation, temporary compounds, MV and HV cabling as well as minor alterations to the public road for the delivery of turbines. A recreational amenity trail was also proposed. The site consists of agricultural lands and forestry underlain by peat.

#### • South Kerry Greenway (Kerry County Council) (2018)

Project manager for the EIAR/EIS of the 32km proposed greenway in Co. Kerry. Elaine is the environmental coordinator for the 32km South Kerry Greenway, which is currently being assessed by An Bord Pleanála. This involved liaising with the client, stakeholders and sub-consultants; the review of technical reports, budget management and programme management. The project will provide a sustainable tourism project, capitilising on the beautiful scenery of the area and will be accessible to all users including families and the elderly.

• Moanvane Wind Farm (Element Power) (2017)

Coordination of EIS/EIAR for a proposed 12-turbine wind farm in Co. Offaly. This application comprised the proposed erection of 12 turbines with a tip height of www.fehilytimoney.ie

#### **Key Information**

#### Qualifications

PhD in Plant Ecology, University College Cork. *"The Status, Ecology and Conservation of Tuberaria guttata (L.) Fourreau in Ireland* 

BSc (First Class Honours). Biological Science, University College Cork

Diploma (Environmental Impact Assessment)

#### **Professional Memberships**

Chartered Institute of Ecology and Environmental Management

#### **Employment History**

#### September 2016 – Present

Fehily Timoney & Company, Cork Senior Scientist and Project Manager

2015 – 2016

Atkins Senior Environmental Consultant

> 2011 - 2014 EirGrid Senior Ecologist

2007 - 2011

Mott MacDonald Ireland Ltd. Ecologist and Environmental Scientist

2007

White Young Green Ecologist



## **Dr. Elaine Bennett**

Senior Scientist



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

169m near Cloneygowan and Portarlington, County Offaly. The proposed development also includes access tracks, substation, temporary compounds as well as minor alterations to the public road for the delivery of turbines. The EIAR also included an assessment of the proposed grid connection to the existing 110kV substation at Mountlucas, Co. Offaly. A significant element of the proposed development is the 'Moanvane Wind Farm Recreational Amenity Trail', which will consist of a looped trail c. 6km in length which will open to the public as a walkway and cycleway. The site contains an area of relatively flat farmland with areas of cutover peat bog and coniferous forestry. The majority of turbines are underlain by peat.

- Derrysallagh Grid Connection (Derrysallagh Wind Farm Ltd.) (2018) Coordination of remedial EIAR/EIS for the party constructed grid connection works and preparation of planning applications and EIARs/EISs for outstanding grid connection works.
- Raragh Cable (Raragh Development Ltd.) (2017)
   Environmental coordinator of EIS and preparation of ecological impact assessment and Stage 1 Screening for Appropriate
   Assessment of the proposed cable development between the permitted Raragh Wind Farm and the electricity substation at
   Kingscourt, Co. Cavan.
- Killarney Quarry (M.F. Quirke and Sons) (Ongoing) Project manager and environmental coordinator for the EIAR for the continuance of use of an existing quarry and proposed extension in Killarney, Co. Kerry.
- Carragraigue Solar Farm Extension (BNRG Neoen Holdings Ltd.) (2018) Project Manager and environmental coordinator for planning application including Planning and Environmental Report for a solar farm extension in Carragraigue, Co. Cork.
- Derragh Substation (Enerco) (2017) Coordinator of the planning application with Environmental Report and Stage 1 Screening for Appropriate Assessment of a proposed new substation for Derragh Wind Farm.
- Johnstown North Solar Farm (BNRG) (2018)
   Environmental coordinator for the Environmental Report supporting a planning application for a proposed 20MW solar farm in Co. Wicklow.
- Wicklow Solar Farm (BNRG Renewables Ltd.) (2016)

Ecological Impact Assessment including habitat and protected species assessment of the proposed solar farm near Rathnew in Co. Wicklow. A Stage 1 Screening for Appropriate Assessment was also conducted to examine the potential for impact on European Sites.

#### **Previous Experience – Appropriate Assessment**

- Cúil na Mona (Bord na Mona). FT prepared a planning application, EIAR, Stage One Screening Report for Appropriate Assessment and a NIS for a 80,000 tpa renewable gas facility at Cúil na Mona, Portlaoise, Co. Laois. The proposed development area totals 17.34 Ha and comprised of a renewable gas facility, external road upgrades and internal site access road. Elaine managed the ecological impact assessment, Stage 1 AA Screening and NIS.
- Strategic Infrastructure Development (SID) Application for Proposed Development at Knockharley Landfill Elaine carried out a Stage 1 Screening for Appropriate Assessment and Natura Impact Statement for the proposed development at Knockharley landfill to support the SID application.
- Wicklow Solar Farm (BNRG Renewables Ltd.) Ecological Impact Assessment including habitat and protected species assessment of the proposed solar farm near Rathnew in Co. Wicklow. A Stage 1 Screening for Appropriate Assessment was also conducted to examine the potential for impact on European Sites.
- EirSpan Sligo and Leinster Bridges Maintenance Works (NRA)
   Stage 1 Screening for Appropriate Assessment of maintenance works on bridges in Sligo (51 bridges) and Leinster (8 bridges).
   Desktop assessment and risk assessment of the proposed works with reference to the qualifying interests and special conservation interests of Natura 2000 sites in proximity to the proposed works.
- Cappamore and Caherconlish Appropriate Assessments (Limerick County Council)

Appropriate assessments were conducted for wastewater discharges from Cappamore and Caherconlish WWTPs. The discharge from Cappamore WWTP is to the Mulkear River which forms part of the Lower River Shannon SAC and the discharge from Caherconlish WWTP is to the Groody River which discharges into the Lower River Shannon SAC.



James Dunn

**Project Engineer** 



CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES

#### Profile

James is a Project Engineer with Fehily Timoney & Company working in the Infrastructure Department. He has a Bachelor of Science in Applied Geology from Staffordshire University and a Masters in Geology from University College Cork. James has 10 years' professional experience in the geological engineering, contaminated land and resource sectors in the UK, Ireland and Australia. James has successfully managed geotechnical, geo-environmental, remediation and resource projects ensuring that projects are delivered within budget and within expected timescales.

With roles having been predominantly site bases ranging from large development sites, waste facilities and remote mine sites, has allowed James to develop sound practical skills in undertaking field based projects from the site investigation phase through to reporting and validation.

#### **Key Skills**

James has extensive experience in the following areas:

- Field work being site based, collecting evidence and producing factual and interpretative reports ensuring project deliverables are delivered.
- Technical and logistical support to Principal Investigators, Post-Doctoral Researchers and PhD Students in Geology.
- Ensuring compliance with the EPA and reporting on all compliance issues to the EPA.
- Day to day management of an RC drilling program, which involved mapping, drill hole planning and target generation as this was a greenfield project.
- As an exploration geologist, management of drill crews, field assistant and surveying contractors. Ensuring accurate data collection and validation of drilling data.
- Maintaining company health and safety standards.

#### **Previous Experience Essentials For This Project**

- Galway Wind Park Capital value c. €300M (2015 Ongoing) Resident Geotechnical Engineer for the construction stage of this wind park, which comprises four individual wind farms—Cloosh, Seecon, Uggool and Lettercraffroe. FT is acting as Contractors Designer to Roadbridge on this project.
- Dunmore East Offshore Site Investigation Supervision of off shore ground investigation works
- Contaminated Land Remediation (Nationwide) Design and supervision of ground investigation & remedial works

#### **Key Information**

Qualifications MSc. Geology, University College Cork, 2014

BSc. Applied Geology: 2:1 (Hons) Straffodshire University, 2005

#### **Professional Memberships**

British Geology Society

**Engineers** Ireland

International Association of Hydrogeologists (IAH)

#### Employment History May 2016- Present

Fehily Timoney & Company Senior Geologist

January 2016 – May 2016

University College Cork Research Support (Geology)

March – December 2015

Ground Investigations Ireland Geologist

September 2014 – March 2015

Resource Recovery, Bord Na Mona Environmental Engineer

#### May 2012 – June 2013

Salva Resources Geologist

> 2010 – 2012 Die Tiete

Rio Tinto Geologist

#### 2005 - 2010

RAW Group Geologist/Project Manager



## **James Redmond**

Senior Engineer



CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES

#### Profile

James works as a Senior Engineer for Fehily Timoney and Company (FT). He is a Chartered Engineer and qualified Project Manager and holds a degree in Civil, Structural and Environmental Engineering from Trinity College, Dublin. He is a Chartered Member of Engineers Ireland and a member of the Project Management Institute.

He is part of the Energy and Infrastructure team at FT. His primary area of expertise is in the planning, design and construction of water services and renewable energy projects in Ireland and the UK.

James developed much of his experience completing numerous wind farm and energy projects, water services, infrastructure and rail works. He has worked in the role of Client Project Manager, Client's Representative, Owners Engineer and as Designer. James's experience includes managing contractors, designers, stakeholders and project funders. He is an experienced project manager with proven skills in managing project costs, programming and quality control for a wide range of renewable energy and infrastructure developments. He also has significant on-site experience relating to managing projects through construction.

#### Previous Experience Essentials For This Project

• Kenmare Water Supply, Ireland Kenmare Water Supply involved the provision of a new raw water and potable water main network for Kenmare town. Acted as project engineer and designed the new water network using EPANET and procured civil engineering contracts.

- Kerry Pike Sewerage Scheme, Ireland
   Designed a new drainage (foul and storm water) network using Microdrainage and
   a pumping station at Kerry Pike, Co Cork. The role also involved dealing with
   contractor's claims and agreeing final accounts.
- Kilcrohane Water and Wastewater Supply Schemes, Ireland Project Engineer for feasibility and design stage of Kilcrohane Water and Wastewater Schemes. These projects involved designing and proposing water scheme and wastewater scheme upgrades. The schemes were designed using EPANET and Microdrainage.
- Ballyvourney Sewerage Scheme, Ireland
   Design Engineer for the wastewater network upgrade at Ballyvourney. Completed
   civil engineering design and project procurement for a new wastewater and
   stormwater drainage network, including a new pumping station in County Cork
- Wexford Business Park Infrastructure Upgrade Works, Ireland Project engineer for scheme involving the upgrading of the business park infrastructure to allow for extension. The project included provision of a new site access, extended surface and foul water networks, new broadband ducting and resurfacing.
- Cork Business Park Infrastructure Upgrade Works, Ireland
   Project involved the upgrading of the business park infrastructure to provide a new
   site access junction, roundabout, new broadband ducting, resurfacing and traffic
   calming measures.
- Kinegar, Middle Balbeggie, Mossmorran Wind Farms, Scotland 2016 17 James acted as project manager for the client. The projects were completed within tight timeframes to meet the Renewable Obligation tariff cut-off dates.

#### **Key Information**

Qualifications PMP, Project Management Professional (PMI)

BAI, Civil Structural and Environmental Engineering, University, YEAR

> BA, Mathematics, University, YEAR

Professional Memberships CEng. MIEI (2010)

CEIIg. WIEI (2010)

PMP Project Management Institute (2016)

#### Employment History 2017- Present

Fehily Timoney & Company Senior Engineer

#### 2012 - 2017

Airvolution Energy Ltd., London, UK Senior Project Manager

#### 2011 – 2012

Renewable Energy Systems, Kings Langley, UK Project Engineer

#### 2010 - 2011

Wind Prospect Ireland, Dublin Civil Engineer

#### 2005 – 2010

Malachy Walsh & Partners Consulting Engineers, Cork Project Engineer/Project Manager



James Redmond

Senior Engineer



CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES

Red Gap, Airfield, East Youlstone, Garlenick, M1J18, Potato Pot, Wythegill Wind Farms, England 2014 - 17
James acted as project manager for the client. The projects were completed within tight timeframes to meet the Renewable
Obligation tariff cut-off dates.

#### • Ysgellog Wind Farm Wales 2012 - 13

Located in Anglesea, Wales, James acted as project manager for the client, overseeing all aspects of the engineering, procurement and construction of the development. Ysegllog won the Outstanding Green Energy Project at the RUK Wales Green Energy Awards 2013.

- Torr Head Tidal Scheme Northern Ireland, 2011
   Project engineer during the planning and feasibility stage. The project is a 150MW subsurface tidal scheme off the coast of
   Northern Ireland and involved the installation of submerged turbines capturing tidal flow. As project engineer James designed
   the onshore substation access road modifications along with advising on onshore substation design and connection of
   offshore cables to the onshore substation.
- Glenree 110kV Substation, Ireland 2010 The project involved the construction of a new 110kV substation, compound, building and all ancillary equipment. Acted as Clients Engineer on the project and advised the contractor on civil engineering design and provided construction management on site.
- Bray Head Stabilisation Works, Ireland, 2010

Project Manager for the stabilisation works to the embankment between Tunnel 3 and Tunnel 4 at Bray Head, Co. Wicklow which was at high risk of collapse



## **Eamon Hutton**

**Project Planner** 



CONSULTANTS IN ENGINEERING. **ENVIRONMENTAL SCIENCE & PLANNING** 

#### Profile

Eamon Hutton is a Project Planner with Fehily Timoney and Company and works as part of the Energy and Environment Team.

Eamon is a Chartered Town Planner with the Irish Planning Institute and holds a BSc in Spatial Planning and A MSc in City Planning and Regeneration which he received from the University of Glasgow. Eamon holds a Post-Graduate Diploma in Urban Design (University of Strathclyde).

Eamon has gained a wide range of experience with Fehily Timoney & Co, focusing on EIA, Wind, Solar and Residential Development.

#### **Key Projects**

Coom Green Energy Park, Co. Cork - (Ongoing)

Contribution to EIAR including chapters: population and human health, alternatives, policy, consultation, introduction and interactions. Involved with public consultation including information nights, technical workshops and door to door consultation.

Drehid Wind Farm, Co. Kildare

Contribution to EIAR and planning statement for wind farm development. Scoping & consultation, population & human health, alternatives, interactions and planning statement.

Derrysallagh Grid Connection Substitute Consent, Co Sligo, Leitrim, Roscommon Input and preparation to a remedial Environmental Impact Assessment Report for substitute consent for the grid connection of the Derrysallagh Wind Farm. Landscape and policy assessment, interactions and non-technical summary. Preparation of planning application notices and documents.

- Kilbarry Residential and Solar Park Development, Co Waterford Contribution to EIAR for a residential development of 750 dwellings and an adjoining solar park. Introduction, description of development, policy, population, human health and material assets, EIA screening, alternatives, interactions and non-technical summary. Preparation of planning documents and statutory notices.
- OPW Flood Risk Assessment & Management Plans Department of Public Procurement. Review of Strategic Environmental Assessment and Appropriate Assessment documents for the national Catchment Flood Risk Assessment & Management Plans produced by the OPW. Content and procedural Review of all 36 plans and environmental assessments.
- **Rosspile Solar Farm, Co Wexford Highfield Energy** Preparation of planning application and statutory notices as well as input to the environmental report for a c. 150ha solar farm in Co. Wexford.
- Middleton House Solar Farm, Co. Longford Preparation of planning report, application documents and statutory notices. Planning consent granted August 2018.
- Planning Application for Flood Defences, Castletroy, Co Limerick IDA Ireland Preparation of planning submission and statutory notices for the development of a flood defence berm and ancillary drainage works at the National Technology Park, Castletroy, Co. Limerick.
- Met Masts

Various planning applications, retention applications, Section 5 applications and further information requests for meteorological masts throughout the country.

Barnahely Battery Storage, Ringaskiddy, Co. Cork Preparation of planning application and statutory notices for a battery storage facility at Barnahely, Ringaskiddy Co. Cork. Planning consent granted August 2018. www.fehilytimoney.ie

#### **Key Information**

#### Qualifications

MSc City Planning & Regeneration, University of Glasgow, 2016

**BSc Spatial Planning** Dublin Institute of Technology, 2012

Post Graduate Diploma in Urban Development University of Strathclyde, 2016

#### **Professional Memberships**

Corporate Member of the Irish **Planning Institute** 

#### **Employment History** 2017- Present

Fehily Timoney & Company **Graduate Planner** Project Planner



## Dr. John Mahon

Senior Acoustic Engineer



CONSULTANTS IN ENGINEERING. ENVIRONMENTAL SCIENCE & PLANNING

#### Profile

John is a Senior Acoustic Consultant with Fehily Timoney & Company. He has a PhD in Acoustics and Vibration and a BA BAI (Hons) degree in Mechanical Engineering from Trinity College Dublin. He is a member of Engineers Ireland and the Institute of Acoustics.

John has over 13 years' experience in acoustics & vibration and has an extensive knowledge and experience in the measurement, prediction and analysis in the field of acoustics and vibration including excellent knowledge of acoustics and vibration legislation, policy and standards at EU and Irish levels. John's primary experience is in environmental noise including measurement and prediction of industrial noise, wind farm noise and road noise. He has completed noise modelling, measurements and assessments for road schemes, wind farm developments, construction projects and industrial sites. He also has significant experience in assessing the acoustic performance of noise barriers and he sits on the Irish and European Committees for Standardization CEN/TC226/WG 6 (Road traffic noise reducing devices).

#### Previous Experience Essentials For This Project

#### **Noise Impact Assessments for Wind Farms**

Undertook noise impact assessments for wind farm projects including background noise assessments, noise predictions for construction and operational phases, compliance noise assessments and noise complaint investigations. He was also responsible for the preparation of environmental impact statements, technical reports and consultation with county councils.

Cordal Wind Farm	Meenwaun Wind Farm
Ballagh Wind Farm	Drehid Wind Farm
Mauricetown Wind Farm	Castletownmoor Wind Farm
Acres Wind Farm	Sigatoka Wind Farm
Cordal Wind Farm	Coolegrean Wind Farm

#### **Multiple Noise Impact Assessments**

He was involved in the submission of multiple noise impact assessments ranging from waste transfer facilities, seaweed processing plants to breweries and visitor centres. These noise impact assessments required attended and unattended baseline measurements as well as carrying operational and construction noise predictions and assessing the predicted noise levels against appropriate noise limits. In some instance mitigation measures were required in order meet noise limits.

#### **Offline Motorway Service Areas**

Noise lead on numerous planning applications for offline motorway service areas. Prepared noise and vibration impact assessments for construction and operational phases. Managed baseline monitoring, modelling of road traffic and industrial noise sources, preparation of technical reports and mitigation design.

#### Aberdeen Western Peripheral Route (AWPR)

Responsible for evaluating the noise impact of the amendment of the road alignment between the specimen design and conceptual design for the Fastlink section of the Aberdeen Western Peripheral Route. This involved noise modelling in accordance with CRTN of the Fastlink section of the AWPR and incorporating mitigation measures to satisfy Transport Scotland's' design goals.

#### **Key Information**

Qualifications

PhD in Acoustics & Vibration, Trinity College Dublin, 2008

Vibration Analysis – ISO 18436-2 Certification, Mobius Institute Board of Certification

BA BAI (Hons) Mechanical Engineering, Trinity College Dublin, 2004

#### **Professional Memberships**

Member of Engineers Ireland

Member of Institute of Acoustics.

#### **Employment History** 2016- Present

Fehily Timoney & Company Senior Acoustic Consultant

#### 2008 - 2015

Infrasonic (Acoustics & Vibration Consultancy), Dublin Position

#### 2008 - 2013

**Trinity College Dublin** Position

#### **Employment History**

Contributed to a Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes. Appendix B - Good Practice Guide for Noise Barrier Design March 2014

Multiple Academic Journal and Conference publications on Flow Induced Noise & Vibration, Noise Barriers and Noise Source Identification Techniques



## **Dr. John Mahon** Senior Acoustic Engineer



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

#### • M8 m73 M74 Motorway Improvements

Responsible for checking the noise performance parameters of environmental noise barriers to be used in the motorway improvement scheme.

#### Noise Assessments at 42 Above Ground Installations, Gas Networks Ireland

Managed a team who carried out environmental and occupational noise monitoring at 42 above ground installation sites. All sites were assessed against environmental noise limits and occupational noise criteria.

#### • Compliance Noise Surveys

Undertook noise monitoring and licence compliance work for EPA licensed landfill and waste facilities, greenfield waste sites and other commercial facilities including data analysis and preparation of technical reports. Carried out reviews of technical reports prepared as part of EPA licensed facilities requirements.

#### • Multiple Noise Impact Assessments

He was involved in the submission of multiple noise impact assessments ranging from waste transfer facilities, seaweed processing plants to breweries and visitor centres. These noise impact assessments required attended and unattended baseline measurements as well as carrying operational and construction noise predictions and assessing the predicted noise levels against appropriate noise limits.

#### • Remedial EIS – Lacken Stone

Noise lead in the preparation of a remedial EIS for Lacken Stone Quarry. He was responsible for the preparation of noise and vibration aspects of the environmental impact statement, including measurement of baseline noise levels, measurement of operational noise levels and noise predictions.



## **Jon Kearney**

Principal Environmental Scientist and Ecologist



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

#### Profile

Jon is a specialist planner and ecologist with over 14 years' experience in both the UK and Ireland. His skills include an extensive knowledge of planning environmental law and planning requirements for ecology and biodiversity. Jon's experience spans ECoW roles, ecology survey techniques and methodology, ornithological surveys, mitigation design, water quality assessment, Appropriate Assessment and Ecological Impact Assessment. Jon has completed ecological assessments, EcIAs, Environmental Impact Assessment Reports (EIAR) and Appropriate Assessments for a wide variety of projects in Ireland and the UK. He has considerable experience of EIS/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.

#### **Key Skills**

Jon has experience in the following:

- Planning environmental law and planning requirements for ecology and biodiversity.
- Ecology survey techniques and methodology,
- Ornithological surveys,
- Mitigation design,
- Water quality assessment,
- Appropriate Assessment
- Ecological Impact Assessment
- ECoW/DSR

#### **Previous Experience Essential For This Project**

#### • North Kerry Railway Line (2017).

The North Kerry Line was comprised of a 32km disused railway line extending from Tralee to Listowel Co. Kerry. larnród Éireann were planning to undertake maintenance and minor engineering works. These works are necessary to maintain the security and resilience of an existing in-situ telecommunications fibre optic which was ploughed into the route, 300-400mm below ground level, in 1996-1998. Ecological surveys (habitats, botanical, bats, birds and mammals) were conducted and areas of ecological constraint to the proposed works were outlined. The contract involved the preparation and coordination of the Ecological Appraisal report, Appropriate Assessment Screening Report and associated figures including habitat maps, site location and designated site maps.

• Environmental consultancy for coastal defence works at Rosslare to Dublin Line, Co. Wexford.

This involved client meetings on site, initial site visit and field study (terrestrial and marine habitat mapping, bird surveys, invasive plant surveys and mammal surveys), AA screening report and consultation.

• Environmental consultancy services for remediation works along Rosslare to Dublin Line, Co. Wicklow.

This involved client meetings on site, initial site visit and field study (terrestrial and aquatic habitat mapping, bird surveys, invasive plant surveys, mammal surveys and bridge structural assessment for bats), AA screening report and consultation.

#### • Dunkettle Interchange, Co. Cork

Jon is the lead ecologist, overseeing a team of ecologists on this scheme. Responsibility for compliance with ecological planning conditions and ecology EIA and NIS commitments for the reconfiguration of the Dunkettle Interchange to a free flow interchange including:

- A series of direct road links between the N8, the N25 and the N40 and links to the R623 regional Road in Little Island and Burys Bridge in Dunkettle;
- 1 grade separated junction arrangement, 4 roundabouts, 51 major structures of various forms;

Key Information

#### Qualifications

M.Sc. Ecological Management and Biological Conservation, Queens University Belfast, 2005

BSc. Applied Ecology University College Cork 2004

#### **Professional Memberships**

MCIEEM Full member of the Institute of Ecology and Environmental Management

#### Employment History July 2015- Present

Fehily Timoney & Company Principal Environmental Scientist

2010 – 2015 Malachy Walsh and Partners

2009 – 2010 Renewable Energy Systems Ltd.

**2007 – 2009** RPS Consulting Engineers

> 2007 Mott McDonald

2006 – 2007 Mouchel

2005 – 2006 Freelance Ecologist

#### **Expert Witness**

Expert Witness at the following oral hearings: Pairc Uí Chaoimh Doolin Pier

#### Publications

Jon Kearney (2010). Kerry slug (*Geomalacus maculosus*) recorded at Lettercraffroe, Co. Galway. Irish naturalists Journal **31** No. 1 p68 - 69



## Jon Kearney

Principal Environmental Scientist and Ecologist



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

- Intertidal area with numerous lagoons within and adjacent to the works areas.
- Extensive pre-construction surveys
- Responsible for translocation of moth plants, water beetle and rare plants.
- Supervision of site clearance.
- ECoW early works contract

#### • N4, Collooney to Castlebaldwin Sligo

Jon is currently FT Environmental Design Lead for the N4 Collooney to Castlebaldwin, in Sligo. Project currently under construction having commenced in January 2019. Responsible for the management of environmental mitigation measures and pre- construction monitoring and design for ecology, noise, hydrogeology, etc. Supervision of site clearance.

#### Pairc Ui Chaoimh Redevelopment Cork City

Lead ecologist for the redevelopment of Pairc Ui Chaoimh. Jon prepared the Flora and Fauna chapter of the EIS and the Natura Impact Statement. Jon was the expert witness for ecology representing the GAA at the subsequent An Bord Pleanála oral hearing following which the project received full planning.

#### • Athea Wind Park 40MW

This project, consist of three adjacent wind farms, consists of 20 turbines. A large majority of the site is located within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (Site Code: 004161). This site and has been designated as a Special protection area (SPA) under the E.U. birds directive of special conservation interest for the hen harrier. Jon was the lead ecologist for Athea. He carried out ornithological surveys, small mammal survey, habitat surveys, vegetative quadrat surveys and bat surveys within the site and the greater surroundings. He prepared several preplanning reports and the ecological monitoring reports during the construction phase of the development. Jon was also involved in the consultation process with NPWS and IFI during construction of the wind farm.

#### • Upperchurch Wind Farm, Co. Tipperary

Jon was the lead ecologist for Upperchurch Wind Farm in Tipperary. He both coordinated and conducted bat, mammal, habitat and ornithological surveys within the study area of the 22 turbine Wind Farm. He prepared the Ecological Impact Assessment, Appropriate Assessment and Ecological Management and Habitat Restoration Plan. Jon was also involved in the consultation process with NPWS.

#### • 'O Grianna Case' Derragh Wind Farm, Co. Cork

Jon was the lead ecologist for Derragh Wind Farm for the most recent application in 2015. The planning for the previous application had been overturned in the high court in the 'O' Grianna Case' due to lack of consideration for the Grid Route. Jon prepared the Natura Impact Statement and Flora and Fauna Chapter of the EIS for the most recent revised application which received planning from An Bord Pleanála.

#### • Doolin Pier Development, Co. Clare

A new harbour development comprising of a 103 metre pier new pier structure, revetment, bed rock dredging, access road and associated works at Doolin, Co Clare. The new facility offered improved access to the Aran Island from the mainland. Jon was the lead ecologist for the EIA. Coordinating and undertaking: Ecological survey (fauna, flora and habitats). Production of an NIS and terrestrial ecology chapter of the EIS. Expert witness at oral hearing for project which received planning

#### • Poorman's Bridge, County Laois

Project ecologist conducted ecological surveys for bats, mammals, as well as habitat and aquatic surveys for Annex I habitats, white-clawed crayfish, salmonids and lamprey. The bridge is located upstream of the only population in the world of the Nore Freshwater Pearl Mussel. Prepared Natura Impact Statement and reviewed detailed construction works method for submission to An Bord Pleanála.

#### • Delphi Bridge Restoration Works, Co. Mayo

The role involved the on-site supervision of construction works to ensure that the agreed method statement was being adhered to for this extremely sensitive site. The bridge was situated on the most important river in Ireland for Freshwater Pearl Mussel. The first year of works was cancelled due to a catastrophic flooding event resulting in damage through the movement of and spillage of sandbags downstream into freshwater pearl mussel habitat, and damage to the riparian vegetation, which was not mitigated against at the time. Project ecologist for the second year of proposed works (2012) following this event. There was ongoing consultation with directors and regional officers within NPWS and IFI. Jon conducted daily turbidity and water chemical analysis which was reported daily to NPWS, IFI and Mayo CountyCouncil.

Moanvane Wind Farm, Co. Offaly

Moanvane is a 12-turbine project in Co. Offaly. FT are acting as the planning consultant for the client and project supervisor for the design stage of the project. Jon was the lead ecologist for the project coordinating ecological survey for both the wind farm and grid route including ornithological, mammal, habitat, bat, aquatic and botanical survey. He coordinated the consultation process with NPWS and other relevant consultees for ecology. Jon prepared the Natura Impact Statement and Biodiversity chapter of the EIS.

#### Baseline Surveys for bat at 34 Bord na Mona bog sites in the midland, Counties Kildare and Offaly

Jon coordinated and conducted a full suite of bat surveys at 34 Bord na Mona bogs in the midlands. A full year of surveys were carried out in 2015 including activity surveys, roost surveys and surveys from height using both automated and manned bat detectors.



## Kristian Divjak Drainage Design Engineer



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

#### Profile

Kristian is a Civil Design Engineer with Fehily Timoney & Company. He holds master's degree in civil engineering (Summa Cum Laude) with focus on water resources engineering. After he graduated as the Best Student of his Generation, he continued his career in Hydroconsult Design Ltd. where he worked under mentorship on various water management projects. He was responsible for 1D and 2D hydraulic modelling. Kristian also worked on designing open channels, culverts and river basin retentions.

Since joining FT, Kristian has worked on numerous Environmental impact assessment reports where his duty was to address impacts of development on hydrology and water quality and to implement mitigation measures. Kristian was responsible for drainage design and flood risk assessment.

#### Key Skills

- Civil Infrastructure
- Flood Risk Assessment
- Open Channel
- Pipeline Hydraulics
- 1D/2D Hydraulic Modelling

#### Previous Experience Essentials For This Project

#### Fehily Timoney and Company, Cork – 2019 - Present

• Oil Separator at MSB Brinny (2020-present)

Kristian was responsible for drainage design of a bypass Class 1 oil separator at MSB Brinny Site. An existing oil separator was replaced by two Class 1 NSBE125 Bypass Oil Separators.

• Cork County Bridge Rehabilitation (2019-2020) Kristian was responsible for high-level hydraulic analysis for nine bridges located throughout Cork County. Kristian was responsible for hydraulic modelling, technical report writing and filling out a Section 50 Application form.

• Coom Green Energy Park (2019 – present)

Kristian was responsible for preparation of the hydrology and water quality chapter of the environmental impact assessment report. He had undertaken the site investigation to identify hydrological constraints. He determined increase in runoff due to the development and impacts of the development on hydrology and water quality. He had to propose mitigation measure for construction, operation and decommissioning stage of the development. He was responsible for flood risk assessment and drainage design. Drainage design has been carried out in In-house Excel spreadsheet and Pipe Flow Advisor.

#### • Dernacart Wind Farm (2019)

Kristian was responsible for preparation of the hydrology and water quality chapter of the environmental impact assessment report. He had undertaken the site investigation to identify hydrological constraints. He determined increase in runoff due to the development and impacts of the development on hydrology and water quality. He had to propose mitigation measure for construction, operation and decommissioning stage of the development. He was responsible for flood risk assessment and drainage design. Drainage design has been carried out in In-house, Excel spreadsheet and Pipe Flow Advisor.

#### **Key Information**

#### Qualifications

MSc (Summa Cum Laude) in Civil Engineering, University of Zagreb, 2015

Bachelor of Engineering (Hons) in Civil Engineering, University of Zagreb, 2013

Bachelor of Engineering (Hons) in Civil Engineering, Polytechnic of Zagreb, 2012

#### Employment History 2019- Present

Fehily Timoney & Company, Cork

**2016 – 2018** Hydroconsult Design Ltd., Croatia

**2015 – 2016** Hydroengineering Ltd., Croatia



## Kristian Divjak Drainage Design Engineer



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

#### • Croaghaun Wind Farm (2019-present)

High level desk study for the proposed wind farm and grid connection to determine key issues and constraints related to hydrology and water quality.

## • Boolard Wind Farm (2019)

Responsible for drainage design for the Boolard Wind Farm.

#### • Killcurly Solar Farm (2019-2020)

Kristian has been responsible for preparation of the hydrology and water quality chapter of the environmental impact assessment report. He had undertaken the site investigation to identify hydrological constraints. He determined increase in runoff due to the development and impacts of the development on hydrology and water quality. He had to propose mitigation measure for construction, operation and decommissioning stage of the development. He was responsible for flood risk assessment and drainage design. Drainage design has been carried out in In-house Excel spreadsheet and Pipe Flow Advisor.

• Croom Residential Development (2019 – present) Kristian has been responsible for drainage design for Croom residential development. Croom residential development consists of 11 apartments. Kristian designed storm, foul and water main network. Storm water and foul network were designed with Flow software developed by Causeway. Water main was designed with EPANET software.

#### Hydroconsult Design Ltd., Croatia - 2016 - 2018 - Civil Engineer Consultant

#### • Study Documentation for Preparing Flood Control Projects for the Zagrebačko Prisavlje Basin

Kristian was responsible for technical report writing, hydraulic modelling, estimating costs of flooding for extreme storm events and preparation of flood risk and flood hazard mapping.

On this project worked a Consortium of three companies. Due to catchment area and complexity of the project, it was divided into three parts. For assigned part, each company had to provide a description of the current state, hydrology and hydraulic model, estimate costs of fluvial flooding for various storm events, flood risk and flood hazard mapping and propose flood risk mitigation measures:

Flood extents have been model for approximately 27km of open channel in HEC-RAS for various extreme flood events. Flood extents were imported into ArcGIS and overlaid with existing infrastructure to estimate costs of flooding. Based on the impact due to flooding, appropriate mitigation measures have been proposed.

# Planning Permission for Flood Mitigation Measures for Town Pakrac (2018) Kristian was responsible for technical report writing, drainage design for approximately 3.2km of open channel, culvert design and hydraulic modelling of the River Pakra to determine water elevation for various extreme storm events. Drainage design of open channels was carried out in Civil 3D. Culverts were designed in In-house software. Hydraulic river modelling was carried out in HEC-RAS.

• Planning Permission for River Regulation of the Bednja River (2018) Kristian was responsible for technical report writing and hydraulic river modelling for approximately 9.7 km of the Bednja River to determine required elevation of embankments for extreme storm events. The hydraulic model of the Bednja River was developed in HEC-RAS.

#### • Planning Permission for an Earthen Retention at Catchment Bahunsko (2017)

Kristian was responsible for technical report writing and design of an earthen retention at catchment Bahunsko. He was responsible to determine the flood extents due to construction of a dam and design of an outfall and emergency spillway. Extreme storm events were modelled in HEC-HMS based on recorded historic rainfall data. The flood extents were determined in ArcGIS for various water elevations. An outfall and emergency spillway were designed in In-house Excel spreadsheet.

## Silvia Garcia Merino

**Senior Project Scientist** 





#### Qualifications

MSc Physics, Climate and geophysics, Basque Country University and Complutense of Madrid (Spain), 2007

MSc Global Change: Ecosystem Science and Policy, UCD and Giessen (Ireland and Germany), 2015

#### Professional Memberships

EWEA and Solar Energy Network (in Linkedin)

#### **Employment History**

**2015 – Present** Senior Project Scientist in Fehily Timoney & Company, Cork, Ireland

2008 - 2013 Wind Engineer in Gamesa, Bilbao (Spain) Silvia works as a Senior Project Scientist with Fehily Timoney & Company. Silvia holds a MSc. in Physics from Complutense University of Madrid(Spain). She is an experienced professional with over 7 years working in energy resource assessments, layout design and environmental impacts of renewable energy projects internationally.

During her professional experience, Silvia has carried out a number of feasibility studies of wind and solar farms and prepare Environmental Impact Statement (EIS) chapters well as coordinate multi-disciplinary teams for the preparation of environmental reports. She has also been project manager for several solar farm planning applications in Ireland.

Since 2015 she also holds an international MSc. in Ecosystem science and Policy from UCD (Ireland) and Giessen University (Germany).

#### **Key Projects**

- **LVIA section for planning applications. 2016-18** Responsible for the preparation of the LVIA for Ballyhale Solar Farm, Co. Tipperary and Barnahely Battery Storage in Co. Cork against others and photography work for a number of solar farm applications.
- Lead of Shadow Flicker and Telecommunication & Aviation Chapters of the Environmental Impact Statement (EIS) of several Wind Farms in the Republic of Ireland. 2015-18

Responsible for the modelling and assessment of Shadow Flicker impacts of Wind Farms for inclusion in the Environmental Impact Statement. Shadow flicker analysis carried out for projects including Slaghbooly Wind Farm (WF) in Co. Clare, Cloghboola WF in Co. Kerry, Castletownmoor WF in Co. Meath, Meenwaun and Moanvane WFs in Co. Offaly. Liaison with the modelling software developer to ensure the suitable methodology for the assessment is used.

• Feasibility studies of Wind and Solar Farms. 2015-18

For a variety of clients across a range of Counties including Cork, Kerry, Roscommon, Tipperary and Wexford.

• Coordination of the EIS and applications for a number of cable routes connecting Wind Farms to the national grid.2016-18

Coordination of the EIS for the Raragh Wind Farm Underground 20KV Grid Connection (Co. Cork). Manage and prepare an EIA Screening Report for a Section 5 application for the Underground Grid Connection Derragh Wind Farm (Co Cork). Manage the EIS for the Derrysallagh Wind Farm Overhead Grid Connection (Co. Sligo).

- Planning application and associated Environmental Report for several Solar Farms in Co. Tipperary, Co. Kilkenny and Co. Cork. 2015-17 Project Manager for the Planning Application and FI response of solar farms (5-15MW). Granted permission obtained for Cahir, Carrick-on-Suir and Ballyhale Solar Farms in Co. Tipperary and Kilkenny.
- **Evaluation of noise performance of different turbine models, windfarms in UK and Germany, 2011 - 12** Study of the performance of different turbine models in terms of the noise impact that they would have in sensitive acoustic points following the national guidelines. Analysis of different turbine control strategies and the impact on the energy production.

## Tony Cummins BAMA

Senior Archaeologist - John Cronin & Associates

#### **Professional Qualifications**

Bachelor of Arts (Honours) – Archaeology and Sociology, UCC, 1992 Master of Arts in Methods and Practices in Irish Archaeology UCC, 1994

Car	eer	Profile	
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October 2009 to date	Archaeologist, John Cronin & Associates
2009	Consultant, INSTAR Research Project, Archaeology Dept., UCC
2003-2009	Archaeologist (Project Manager), Sheila Lane & Associates
2003	Archaeologist (Site Director), Eachtra Archaeological Projects
1999-2002	Senior Archaeologist, Aegis Archaeology Ltd.
1998-1999	Archaeologist (Site Director), Archaeological Services Unit, Archaeology
	Department, UCC
1991-1998	Various roles as a member of <b>excavation teams</b> working on wide range of archaeological sites

#### **Relevant Experience**

Tony joined John Cronin & Associates in October 2009 as a licence-eligible archaeologist. He gained his excavation experience while working on a wide range of archaeological sites from his time as an undergraduate student onwards. These included the prehistoric settlements at Ferriter's Cove, Co. Kerry, and Lough Gur, Co. Limerick, and medieval sites such as Desmond Castle, Newcastle West and Franciscan Friary, Limerick City. Tony also gained experience working abroad while partaking in the excavations of a Roman bath-house in Beirut and a Romano-British enclosure in Wales.

From 1994-2002, Tony was appointed as site supervisor on the annual UCC training excavation at an early ecclesiastical enclosure in Caherlehillan, Co. Kerry under the direction of John Sheehan, Archaeology Dept., UCC. Since becoming a licence-eligible archaeologist in 1998, Tony has been employed as a site director and project manager with a number of Irish archaeological consultancies. He has been responsible for directing excavations at a variety of archaeological sites including:

- Desmond Castle, Newcastle West
- Gorteen's Castle, Co. Kilkenny,
- Ballintemple souterrain, Cork City
- Ballysimon ringwork, Co. Limerick

Tony has prepared a wide range of cultural heritage assessments for both residential and infrastructural projects, including road, drainage, pipeline and wind farm schemes. He was recently part of the archaeological team that compiled the cultural heritage section of the EIS for the M20 Cork-Limerick Motorway Scheme. He was appointed project manager with responsibility for overseeing a number of phases of archaeological investigations on the N25 Waterford Bypass and the Limerick Southern Ring Road. His work on the latter project led him to co-author (with Ms Tracy Collins) *The excavation of a medieval ringwork at Ballysimon, Co. Limerick* (Aegis Archaeology, 2002). Tony was also a member of the archaeological teams involved on road schemes such as the N8 extension of the Portlaoise Bypass, the Croom Bypass and the N18 Road Improvements (Dromoland to Crusheen, including the Ennis Bypass).

Since joining our company Tony has conducted the field survey component of the Bearna to Ros an Mhíl Route Option Assessment. He has also undertaken a number of archaeological impact assessments for proposed windfarms such as Tullabrack, Co. Clare, Ballycurreeen, Co. Waterford and Barnastooka, Co. Kerry. He also has managed the programmes of archaeological monitoring conducted in advance of ESB windfarm developments at Grouselodge, Co. Limerick and Woodhouse, Co. Waterford. Both Tony and John Cronin co-ordinated the Mining Heritage Survey, Allihies, Co. Cork (2012).

## John Cronin BA MRUP MUBC Dip. Geol MIAI

Principal Consultant – John Cronin & Associates

#### **Professional Qualifications**

Master of Urban & Building Conservation, School of Architecture, University College Dublin, 1999 Diploma in Geology (Evening Course), University College Cork, 1996 Master of Regional & Urban Planning, University College Dublin, 1993 Bachelor of Arts (Honours) - Archaeology & Geography, University College Cork, 1991 Member of Institute of Archaeologists of Ireland

#### **Career Profile**

2000 to date	Managing Director and Principal Consultant, John Cronin & Associates
1999 – 2000	Executive Planner (Conservation), Donegal County Council
1998 – 1999	Conservation Officer, Cork County Council
1995 – 1998	Archaeology and Historic Building Officer, Cork County Council
1994 – 1995	Principal Research Officer, Urban Archaeological Survey, UCC, Cork
1993 – 1994	Surveyor, Landesamt für Archaeologie, Dresden, Germany

#### **Relevant Experience**

Mr Cronin is an archaeologist, town planner and building conservation consultant with over nineteen years postgraduate experience garnered in the public and private sectors. Mr Cronin has prepared numerous cultural heritage assessments for environmental impact assessments throughout Ireland and has supervised architectural surveys in Counties Cork, Donegal and Dublin. He advises private developers in relation to archaeological and building conservation issues and has acted as consultant to The Heritage Council, the National Inventory of Architectural Heritage and An Bord Pleanála.

Since entering private practice Mr. Cronin has worked on a wide range of conservation and cultural heritage related projects for large infrastructural schemes, some of which include:

- Waterford N25 By-Pass. The scheme involved an 18km bypass route incorporating a new bridge over the River Suir, and 8km of associated link roads. John Cronin was responsible for (i) Preparation of the Cultural Heritage Route Option Report, (ii) Expert Evidence at An Bord Pleanála hearing and (iv) specification of archaeological mitigation measures
- A1/N1 Newry-Dundalk Road Scheme. Dual carriageway link road across the border between Cloghoge roundabout, south of Newry, and Ballymascanlan interchange, north of Dundalk. John Cronin was responsible for (i) Cultural Heritage Impact Assessment of the proposed scheme, (ii) expert Evidence at An Bord Pleanála hearing and (iii) specification of archaeological mitigation measures. This scheme progressed to archaeological investigation works and pre-construction phase, the project management and liaison of which was undertaken by John and co-ordinated on a day-to-day on-site basis by John Cronin & Associates.
- N4 Drumsna Longford Road Improvement Scheme. The scheme comprises a realignment of a 25 km section of the N4 National Primary Route extending from the eastern end of the Drumsna bypass (N4/R201 junction) to the western side of Longford town (N4/R198 junction). Mr Cronin was responsible for the preparation of cultural heritage constraints report for this scheme.
- N22 Road Improvement Scheme (Farranfore and Killarney). The proposed N22 Road Improvement Scheme between Farranfore and Killarney consists of three distinct sections: N22 Farranfore to Killarney, Killarney Link Road and N71/N22 Link Road. For this scheme, John Cronin prepared the Cultural Heritage Impact Assessment of the proposed Route Options.
- Realignment of the N77 between Kilkenny and Ballyragget. John Cronin prepared the Cultural Heritage Impact Assessment of the proposed route options associated the proposed realignment of the existing N77 Kilkenny to Ballyragget road.
- Fota Island/Cobh Regional Road (Upgrade). John Cronin prepared the Route Option Assessment in relation to cultural heritage for this localised improvement of the R624 Cobh Road, on Fota Island, from the entrance to Fota Demesne to the Dog's Lodge, near Slatty Bridge (a distance of approximately 2.15 km in length).

#### **Karen Banks**

#### Coolnacaheragh, Lissacresig, Macroom, Co.Cork Tel: 083 4218641; email: greenleafecology@outlook.com

#### Profile

I am an ecologist with 12 years' experience in the field of ecological assessment. I hold a BSc in Environment and Development from Durham University, and am a full member of the Chartered Institute of Ecology and Environmental Management. I specialise in ecological field survey, am a skilled botanical surveyor and a licensed bat surveyor. In my career as an ecologist I have managed Appropriate Assessments (AA) covering the transport, energy and land use sectors, with work including assessment of Plans at the national, regional and local level; and numerous AAs of projects. I have managed Ecological Impact Assessments (EcIA) including those for flood alleviation schemes, wind farms and transport infrastructure. Current and recent projects undertaken include the Suir CFRAMS AA, Flood Relief Scheme AA and EcIA for the Morrell and Baile Bhuirne and several bridge repair project AA and EcIA.

#### Areas of expertise

- Appropriate Assessment
- Ecological Impact Assessment (EcIA)
- Preliminary Ecological Assessment
- Habitat survey

- Detailed botanical survey
- Bat survey (licence holder)
- Mammal survey
- GIS/ mapinfo

#### Projects

**Baile Bhuirne Flood Relief Scheme** (*Office of Public Works*) – Appropriate Assessment and Ecological Impact Assessment of the proposed flood relief scheme in Co. Cork (2017-ongoing).

**Natura Impact Report Suir CFRAM Flood Risk Management Plan** (*Office of Public Works*) - Stage 2 Appropriate Assessment of the Suir CFRAM Flood Risk Management Plan (2016-ongoing).

**Bat Survey and Assessment Greater Dublin Drainage Scheme** (*Irish Water*) - bat survey and assessment for the proposed drainage scheme and WwTP upgrade (2017- ongoing).

**NIS and EcIA N70 Sneem to Blackwater Bridge Upgrade** (*Kerry County Council*) - Stage 2 Appropriate Assessment and Ecological Impact Assessment of the N70 Sneem to Blackwater Bridge road upgrade and re-alignment scheme (2016- ongoing).

**Bat Survey and Assessment M28 Cork to Ringaskiddy Motorway Scheme** (*Cork County Council*) – winter bat survey and assessment for the proposed motorway scheme (2017).

Screening for Appropriate Assessment and Bat Survey Haulbowline Island Steelworks Remediation (*Cork County Council*) - AA Screening, bat survey and assessment and ecology input to EIA Screening of Haulbowline Island Steelworks Remediation project (2016ongoing).

**PEA Cobh Cross Service Area** (*Applegreen*) - Preliminary ecological assessment of proposed service area in Carrigtwohill, Co. Cork (2016- 2017).

#### October 2013- November 2016: Senior Project Ecologist, RPS

Project experience includes:

**Ecological Reports and Appropriate Assessment Screening: bridge maintenance works** (*Cork County Council*) - Ecological assessment of works on 10 bridges in County Cork (2014-2016).

Appropriate Assessment Screening: TII Programme of Bridge Rehabilitation Works, Counties Cork, Clare and Kerry (*Transport Infrastructure Ireland*) – Appropriate Assessment of rehabilitation works to bridges across three counties (2016-2017).

Appropriate Assessment of Dun Laoghaire Rathdown County Development Plan (2016-2022) (*DLRCC*) – Stage 2 Appropriate Assessment of the DLRCC County Development Plan (2014-2016).

**Natura Impact Reports of Regional Waste Management Plans 2015-2051** (*Regional lead Local Authorities*) - Stage 2 Appropriate Assessments of the three Regional Waste Management Plans (2014-2015).

**Natura Impact Report (NIR) of Investing in Our Transport Future: A Strategic Framework for Integrated Land Transport** (*DoTTS*)- Stage 2 Appropriate Assessment for the Strategic Framework for Investment in Land Transport, which makes the case for future investment in transport nationally and prioritises future transport resources (2014- 2015).

**Ecological Impact Assessment and Appropriate Assessment of Taurbeg Wind Farm** (*RES*) - Ecological Impact Assessment and Appropriate Assessment of proposed extension of operation of the 11 turbine Taurbeg Wind Farm for a further 5 years (2015- 2016).

**Ecological Impact Assessment and Appropriate Assessment of Fassaroe Mixed Housing Development** (*Cosgrave*) – Ecological Impact Assessment and Stage 2 Appropriate Assessment of the mixed housing development in Co. Wicklow (2015- 2017).

**Ecological Impact Assessment and Appropriate Assessment of Carrigadoon Wind Farm** (*DunoAir*) - Ecological Impact Assessment and AA Screening of proposed 8 turbine wind farm in Co. Tipperary (2014- 2015).

**Ecological Impact Assessment and Appropriate Assessment of the Morrell Flood Relief Scheme** (*Kildare County Council*) – Ecological Impact Assessment and AA Screening of the flood relief scheme in Co. Kildare (2014- 2016).

**Appropriate Assessment of four WwTPs in Kilkenny and Limerick** (*Irish Water*) - Appropriate Assessment Screening of three WwTPs and Stage 2 Appropriate Assessment of Murroe WwTP (2014).

## Dr. Avril Challoner CCsi BEng MIEnvSc MIAQM

Senior Air Quality Consultant

#### EDUCATION

BE Environmental Engineering Diploma Statistics PhD Trinity College, Dublin NUIG 2009 Trinity College Dublin 2010 Trinity College Dublin 2012

#### MEMBERSHIP OF PROFESSIONAL ORGANISATIONS

Chartered Scientist (CSci) Member of the Institution of Environmental Sciences (IES) Member of the Institute of Air Quality Management (IAQM)

#### **KEY SKILLS**

- Senior Air Quality Consultant at AWN Consulting.
- Over 7 years' experience in the modelling, assessment and reporting of air quality impacts associated with major industrial and infrastructural projects.
- Extensive experience in the monitoring of ambient air quality and indoor air quality.
- Detailed knowledge of the National Roads Authority Publication "Guidelines For The Treatment Of Air Quality During The Planning and Construction Of National Road Schemes" (2011)
- Extensive experience in the presentation of technical information in the written form.
- Experience in the use of software packages such as AAQuIRE, DMRB and AERMOD for the air quality assessments of major infrastructural and industrial projects.
- Detailed knowledge of air quality standards, air dispersion modelling guidance and impact assessment methods.

#### CAREER SUMMARY

#### AWN Consulting, Senior Air Quality Consultant, 2017 to date

Senior Environmental Consultant with extensive experience in air and odour dispersion modelling using AERMOD. EIAR projects include large-scale infrastructural projects and industrial developments, including associated oral hearings.

#### AWN Consulting, Air Quality Consultant, 2015 to 2017

Environmental Consultant with responsibility for Air Quality. EIS projects include the preparation of Air Quality and Climate chapters for EIS on large infrastructural projects.

#### AECOM, Graduate Air Quality Consultant, 2012 to 2014

Graduate Environmental Consultant with responsibility for Air Quality. Experienced in various air quality assessments, with a focus on road modelling, including; USA, Construction Dust, AAQuIRE, DMRB, Air Quality Neutral Assessments and WebTAG.





CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

# **APPENDIX 4-1**

Responses to Scoping Letter




Mon 02/07/2018 15:19

Manager Dau <Manager.Dau@chg.gov.ie>

Waterford Airport Runway Extension

To O Eamon Hutton

|--|--|

#### Your Ref: - P1694/Lett/EH/CF

Our Ref: G Pre00168/2018 (Please quote in all related correspondence)

A Chara

On behalf of the Department of Culture, Heritage and the Gaeltacht, I acknowledge receipt of your recent consultation. In the event of observations, you will receive a response by email from Development Applications Unit (DAU) on behalf of the Department.

The normal target turnaround is six weeks from date of receipt. If observations are received before this time, DAU will be in contact at that stage.

If you have not heard from DAU and wish to receive an update, please telephone the direct line number below or email manager.dau@chg.gov.ie .

Le meas Diarmuid Buttimer

Diarmuid Buttimer Development Applications Unit Department of Culture, Heritage, and the Gaeltacht. Newtown Road Wexford Tel: 053 911 7326 Email: <u>Diarmuid.Buttimer@ahg.gov.ie</u>



An Roinn Cultúir, Oidhreachta agus Gaeltachta Department of Culture, Heritage and the Gaeltacht

Wed 27/06/2018 14:34

Minister Naughten < Minister.Naughten@DCCAE.gov.ie>

Acknowledgement

To O Eamon Hutton

MN

#### Dear Mr Hutton,

On behalf of Mr Denis Naughten, TD, Minister for Communications, Climate Action and Environment, I wish to acknowledge receipt of your letter dated 22<sup>nd</sup> June 2018 regarding the Waterford Airport Runway Extension.

-

I will ensure your letter is brought to Minister Naughten's attention.

Yours sincerely, Enda Fitzgerald.

-----

#### Enda Fitzgerald

Clerical Officer Minister Naughten's Office

Roinn Cumarsáide, Gníomhaithe ar son na hAeráide agus Comhshaoil Department of Communications, Climate Action and Environment

29-31 Bóthar Adelaide, Baile Átha Cliath, D02 X285, Éire 29-31 Adelaide Road, Dublin, D02 X285, Ireland

Tel +353 1 678 2205

enda.fitzgerald@dccae.gov.ie www.dccae.gov.ie

The Department of Communications, Climate Action and Environment requires customers to provide certain personal data in order to provide services and carry out the functions of the Department. Your personal data may be exchanged with other Government Departments and Agencies in certain circumstances, where lawful. Full details can be found in the Data Privacy Notice, which is available <u>here</u> or in hard copy upon request



Guidelines on the treatment of tourism in an Environmental Impact Statement

# 1. Introduction

Tourism is a significant component of the Irish Economy – estimated to employ approximately 205,000 people – and contributing  $\in$ 6.6 billion in spending to the economy in 2014. The environment is one of the main resources upon which this activity depends – so it is important that the EIS evaluates whether and how the interacting impacts of a project are likely to affect tourism resources.

The purpose of this short note is to provide guidance on how these impacts can be assessed through the existing EIA process. Undertaking an EIA is governed by the EIA Advice Notes published by the EPA. These Advice Notes contain detailed guidance on how to describe and evaluate the effects arising from a range of projects, including tourism projects.

These guidelines were written with the assistance of Conor Skehan, Head of Department of Environment and Planning, Dublin Institute of Technology.

## 2. Tourism and the Environment

There are two interactions between tourism and the environment.

- 1. Impacts caused by Tourism Projects
- 2. Impacts affecting Tourism (e.g. the quality of a destination or a tourism activity)

#### Impacts caused by Tourism Projects

Tourism projects can give rise to effects on the environment. These are specifically dealt with under a number of Project Types in the Advice Notes, specifically:

#### **12 TOURISM AND LEISURE**

a. Ski-runs, ski-lifts and cable-cars where the length would exceed 500 metres and associated developments. Project Type 20

b. Sea water marinas where the number of berths would exceed 300 and fresh water marinas where the number of berths would exceed 100. Project Type 10

c. Holiday villages which would consist of more than 100 holiday homes outside built-up areas; hotel complexes outside built-up areas which would have an area of 20 hectares or more or an accommodation capacity exceeding 300 bedrooms. Project Type 28

d. Permanent camp sites and caravan sites where the number of pitches would be greater than 100. Project Type 28

e. Theme parks occupying an area greater than 5 hectares. Project Type 29

Figure 1 The Advice Notes contain detailed descriptions on how to describe and evaluate the effects arising from a range of tourism projects.

#### Impacts affecting Tourism

Environmental effects of other projects on tourism are not specifically addressed in the Advice Notes. Taking account of the significance of tourism to the Irish economy a specialist topic of 'Tourism' has been prepared to facilitate a systematic evaluation of effects on this sector within the format laid down for other parts of the Environmental Impact Statement.

It is not intended that the assessment of effects on tourism should become a separate section of the Impact Statement, instead it is intended to become a specialist sub-section of the topic 'Human Beings' which is currently described in Section 2 of the Advice Notes

## **3. Tourism in the Existing Environment**

#### Introduction

Visitor attitude surveys reveal that the following factors – in order of priority – are the reasons that tourists visit and enjoy Ireland:

- Beautiful scenery
- Friendly & hospitable people
- Safe & Secure
- Easy, relaxed pace of life
- Unspoilt environment
- Nature, wildlife, flora
- Interesting history & culture
- Plenty of things to see and do
- Good range of natural attractions

It is noteworthy that over half of the factors listed are environmental and that all others are related to the way of life of the people. The following describes how these factors are considered within an EIS, set out under EIA topic headings, and how they interact with tourism.

#### Beautiful scenery

This is covered in the 'Landscape' Section. Particular attention needs to be paid to effects on views from existing purpose-built tourism facilities, especially hotels, as well as views from touring routes and walking trails. It is important to note that there appears to be evidence that the visitor's expectations of 'beautiful' scenery does not exclude an admiration of new modern developments – such as windfarms – which appear to be seen as indicative of an modern, informed and responsible attitude to the environment.

#### Friendly & hospitable people

This is not an environmental factor though it is indirectly covered under the '*Human Beings*' section of the EIS. The principal factor is the ratio of visitors to residents. This is of less significance in areas with longestablished patterns of tourism.

#### Safe & Secure

This is not an environmental issue – though some of the factors that are sometimes covered under the heading of '*Human Beings'* – such as social inclusion or poverty – can point to likely effects and interactions.

#### Easy, relaxed pace of life

This is not an environmental issue though it is partially covered under *'Human Beings'* – see comments above.

#### Unspoilt environment

This is covered under the sections dealing with '*Landscape'*, '*Flora'* and '*Fauna'* and to a lesser extent under emissions to '*Water'* and '*Air'*. In some instances traffic congestion, especially in rural areas, can be an issue, this is usually covered within '*Material Assets'*.

#### Nature, wildlife, flora

This is principally covered under the headings of '*Flora*' and '*Fauna*' and to a lesser extent by '*Landscape*', '*Water*' and '*Air*'. The principal issues being to avoid any effects that might reduce the health or extent of the habitats. This can occur either directly, by impinging on the site, or indirectly, through emission, that can affect the natural resources, like clean water, which the habitat depends on. It also considers effect on physical access to and visibility of these sites. Occasionally there are concerns about the disturbance or wear and tear of visitor numbers to such sites.

#### Interesting history & culture

This is principally covered under '*Cultural Heritage*' and, to a lesser extent, under '*Human Beings*'. The principal issues being to avoid damage to sites and structures of cultural, historical, archaeological or architectural significance – and to their contexts or settings. It also considers effect on physical access to and visibility of these sites. Occasionally there are concerns about the wear and tear of visitor numbers to such sites.

Plenty of things to see and do.

This is not an environmental issue though it is partially covered by the '*Human Beings*' section, where the tourism resources of an area are described and assessed.

#### Good range of natural attractions

This is covered by the `*Landscape'*, `*Flora'*, `*Fauna'*, and `*Cultural Heritage'* sections of the EIS.

# 4. Project factors affecting Tourism

#### Introduction

Tourism can be affected both by the structures or emissions of new developments as well as by interactions between new activities and tourism activities – for example the effects of high volumes of heavy goods vehicles passing through hitherto quiet, scenic, rural areas. Tourism can be affected by a number of the characteristics of the new project such as:

- New Developments
- Social Considerations
- Land-uses and Activities
- New Developments will the development stimulate or suppress demand for additional tourism development in the area? If so, what type, how much and where? Marinas, golf courses, other major sporting facilities as well as theme parks and larger conference facilities can all stimulate the emergence of new accommodation, catering and leisure facilities often within an extensive area around a new primary visitor facility. Extensive urbanisation and large scale infrastructure as well as certain processing and extractive industries all have the potential to suppress demand for additional tourism – but usually only in the immediate locality of the new development. It should be noted however, that some types of new or improved large scale infrastructure – such as roads – can improve the visitor experience – by increasing safety and comfort or can convey a sense of environmental responsibility – such as wind turbines.
- Social Consideration will the development change patterns and types of activity and land use? Will it affect the demographics, economy or social dynamics of the locality?
- Land-use will there be severance, loss of rights of way or amenities, conflicts, or other changes likely to ultimately alter the character and use of the tourism resources in the surrounding area?

#### Existing Tourism

In the area likely to be affected by the proposed development, the following attributes of tourism, or the resources that sustain tourism, should be described under the following headings.

Note that the detailed description and analysis will usually be covered in the section dealing with the relevant environmental topic – such as '*Landscape'*. Only the relevant finding as to the likely significance to, or effect on, tourism needs to be summarised in this section.

#### Context

Indicate the location of sensitive neighbouring tourism resources that are likely to be directly affected, and other premises which although located elsewhere, may be the subject of secondary impacts such as alteration of traffic flows or increased urban development. The following should be noted in particular:

- Hotels, conference centres, holiday accommodation including holiday villages, holiday homes, and caravan parks.
- Visitor centres, Interpretive centres and theme parks
- Golf courses, adventure sport centres and other visitor sporting facilities
- Marinas and boating facilities
- Angling facilities
- Equestrian facilities
- Tourism-related specialist retailers and visitor facilities
- Historic and Cultural Sites
- Pedestrian, cycling, equestrian, vehicular and coach touring routes

Indicate the numbers of premises and visitors likely to be directly affected directly and indirectly.

Identify and quantify, where possible, their potential receptors of impacts, noting in particular transient populations, such as drivers, walkers, seasonal and other non-resident groups.

Describe any significant trends evident in the overall growth or decline of these numbers, or of any changes in the proportion of one type of activity relative to any other.

Indicate any commercial tourism activity which likely to be directly affected, with resultant environmental impacts.

#### Character

Indicate the occupations, activities or interests of principal types of tourism in the area. – Where relevant, describe the specific environmental resources or attributes in the existing environment which each group uses or values; where relevant, indicate the time, duration or seasonality of any of those activities. For example describe the number of guides, boats and anglers who use a salmon fishery and the duration of the salmon season as well as the quantity and type of local accommodation that is believed to be used by the anglers.

#### Significance

Indicate the significance of the principal tourism assets or activities likely to be affected. Refer to any existing formal or published designation or recognition of such significance. Where possible provide an estimate of the contribution of such tourism activities to the local economy. For instance refer to the number of annual visitors to a tourism attraction or to the grading of a hotel.

#### Sensitivity

Describe any significant concerns, fears or opposition to the development known to exist among tourism interests. Identify, where possible, the particular aspect of the development which is of concern, together with the part of the existing tourism resource which may be threatened. For instance describe the extent of a potential visual intrusion onto a site of historic significance which is the main local tourist attraction.

#### 5. Impacts on Tourism

#### "Do Nothing" Impact;

Describe how trends evident in the existing environment will continue and how these trends will affect tourism.

#### **Predicted impact;**

- Describe the location, type, significance, magnitude/extent of the tourism activities or assets that are likely to be affected.
- Describe how the new development will affect the balance between longestablished and new dwellers in an area and it's affect on the cultural or linguistic distinctiveness of an area. For example describe the effect of a new multi-national population required for an international call-centre located in a Gaeltacht area.
- Describe how changes in patterns of employment, land use and economic activity arising from the proposed development will affect tourism, for example, illustrating how a new industrial development will diversify local employment opportunities thereby reducing the area's unsustainable overreliance on seasonal tourism.
- Describe the consequences of change, referring to indirect, secondary and cumulative impacts on tourism; Examples can include describing how the new development may lead to a reduced assimilative capacity for traffic or water during the peak of the tourism season or how new urbanism combined with existing patterns of tourism may lead to unsustainable levels of pedestrian traffic through a sensitive habitat.
- Describe the potential for interaction between changes induced in tourism and other uses that may affect the environment – for instance increasing new tourism-related housing affecting water resources or structures
- Describe the worst case for tourism if all mitigation measures fail.

# 6. Mitigating adverse impact on Tourism

Describe the mitigation measures proposed to:

- avoid sensitive tourism resources such as views, access, and amenity areas including habitats as well as historical or cultural sites and structures.
- reduce the exposure of sensitive resources to excessive environmental burdens arising from the development's emissions or volumes of traffic [pedestrian and vehicular], and/or losses of amenity arising from visually conspicuous elements of the development – for example by prioritizing visual screening of views from a hotel towards a quarry.
- reduce the adverse effects to tourism land uses and patterns of activities especially through interactions arising from significant changes in the intensity of use or contrasts of character or appearance – for example by separating traffic routes for industrial and tourism traffic.
- remedy any unavoidable significant residual adverse effects on tourism resources or activities, for example by providing alternative access to tourism amenities – such as waterways or monuments.



Mon 09/07/2018 10:50

Jane Gilleran <Jane.Gilleran@fisheriesireland.ie>

Waterford AirportRunway Extension

To OEamon Hutton

Dear Eamon,

Many thanks for your letter seeking comment on the proposed runway extension at Waterford Airport.

While IFI have no specific comment to make , we would like to see how the extra surface water run-off from the runway and carpark extension is to be treated addressed in the EIAR.

Regards

Jane

Jane Gilleran Fisheries Environmental Officer Inland Fisheries Ireland - Clonmel

Iascach Intíre Éireann Inland Fisheries Ireland

Tel 052 618 0055 Email <u>jane.gilleran@fisheriesireland.ie</u> Web <u>www.fisheriesireland.ie</u>

Anglesea St, Raheen, Clonmel, Co. Tipperary E91 RD25

Help Protect Irelands Inland Fisheries - Call 1890 34 74 24 to report illegal fishing, water pollution or invasive species.



**Uisce Éireann** Bosca OP 6000 Baile Átha Cliath 1 Éire

**Irish Water** PO Box 6000 Dublin 1 Ireland

T: +353 1 89 25000 F: +353 1 89 25001 www.water.ie

Eamon Hutton Fehily Timoney & Co Core House Pouladuff Road Cork

6<sup>th</sup> July 2018

# RE: Waterford Airport Runway Extension – EIAR/EIS Scoping Consultation Process

Dear Mr Hutton,

Irish Water (IW) acknowledges receipt of your letter dated 22<sup>nd</sup> June regarding the EIAR/EIS scoping and consultation process for the above development. On an initial review, Irish Water does not have objections to the proposed development.

Please also see attached our suggested scope in relation to Water Services.

Yours Sincerely,

Jana Goold Regional Forward Planning Specialist

# **Response to EIS Scoping Report Requests**

IW currently does not have the capacity to advise on scoping of individual projects. However, in general we would like the following aspects of Water Services to be considered in the scope of an EIS where relevant;

- a) Impacts of the development on the capacity of water services (do existing water services have the capacity to cater for the new development if required).
- b) Any up-grading of water services infrastructure that would be required to accommodate the development.
- c) In relation to a development that would discharge trade effluent any upstream treatment or attenuation of discharges required prior to discharging to an IW collection network
- d) In relation to the management of surface water; the potential impact of surface water discharges to combined sewer networks & potential measures to minimise/stop surface waters from combined sewers
- e) Any physical impact on IW assets reservoir, treatment works, pipes, pumping stations, discharges outfalls etc. including any relocation of assets
- f) Any potential impacts on the assimilative capacity of receiving waters in relation to IW discharge outfalls including changes in dispersion /circulation characterises
- g) Any potential impact on the contributing catchment of water sources either in terms of water abstraction for the development (and resultant potential impact on the capacity of the source) or the potential of the development to influence/ present a risk to the quality of the water abstracted by IW for public supply.
- h) Where a development proposes to connect to an IW network and that network either abstracts water from or discharges waste water to a "protected"/sensitive area, consideration as to whether the integrity of the site/conservation objectives of the site would be compromised.
- i) Mitigation measures in relation to any of the above

#### This is not an exhaustive list.

Please note

- If a development will require a connection to either a public water supply or sewage collection system the developer is advised to contact Irish Water's Connections and Developer Services Team prior to applying for planning permission.
- For Information on Irish Water assets please send a query to <u>DataRequests@water.ie</u>
- Irish Water will not normally accept new surface water discharges to combined sewer networks



An Roinn Gnó, Fiontar agus Nuálaíochta Department of Business, Enterprise and Innovation

Our Ref: 180839/MIN

**3** July, 2018

Mr. Eamon Hutton Fehily Timoney & Company Core House Pouladuff Road Co. Cork FEHILY TIMONEY & Co.

Distribution

0 6 JUL 2018

Job No: Correspondence No: Comment:

Dear Mr. Hutton,

I wish to acknowledge receipt of your recent correspondence to the Minister for Business, Enterprise and Innovation, Ms. Heather Humphreys, T.D., concerning Waterford Airport Runway Extension.

I will bring your correspondence to the Minister's attention at the earliest opportunity.

Yours sincerely,

mack.

Bamonn McCormack Private Secretary

Sráid Chill Dara, Baile Átha Cliath 2, D02 TD30, Éire • Kildare Street, Dublin 2, D02 TD30, Ireland T: + 353 1 631 2121 / 1890 220 222 • F: + 353 1 631 2827 • www.dbei.gov.ie • info@dbei.gov.ie



Office of the Minister for Agriculture, Food and the Marine, Dublin 2. Oifig an Aire Talmhaíochta, Bia agus Mara, Baile Átha Cliath 2.

# FEHILY TIMONEY & Co.

Distribution

2 8 JUN 2018

Job No: Correspondence No: Comment:



Mr. Eamonn Hutton Fehily Timoney and Company Ltd. Core House Pouladuff Road Cork

PLEASE QUOTE REF NUMBER ON ALL CORRESPONDENCE. Our Ref: 2018/59838N /PO Your Ref: P1694/Lett/EH/CF

Dear Mr. Hutton

I wish to acknowledge receipt of your recent correspondence addressed to the Minister for Agriculture, Food and the Marine, Michael Creed, TD concerning Waterford airport runway extension.

I will undertake to bring your correspondence to the Minister's attention at the next practical juncture. In the interim I have forwarded your correspondence for the attention of relevant Department officials.

Yours sincerely,

e Case

Graham Lennox Private Secretary

All personal data processed by this Office will take place in accordance with the law on Data Protection and will only be for the purpose(s) connected to the functions of the Office. Further information is available on the Department's Data Protection page: https://www.agriculture.gov.ie/dataprotection/

Telephone: (01) 607 2884 LoCall 1890 200 510 Facsimile (01) 661 1013 E-mail minister@agriculture.gov.ie



An Roinn Gnó, Fiontar agus Nuálaíochta Department of Business, Enterprise and Innovation

Minister for Trade, Employment, Business, EU Digital Single Market and Data Protection

21 June 2018

Core House Pouladuff Road

Cork

# FEHILY TIMONEY & Co.

Distribution

**2 8 JUN 2018** Job No: Correspondence No: Comment:

Dear Mr. Hutton

Mr. Eamon Hutton

Fehily Timoney & Company

Thank you for your correspondence dated 22 June 2018 to Pat Breen T.D., Minister for Trade, Employment, Business, EU Digital Single Market and Data Protection concerning Waterford Airport Extension.

I will bring your correspondence to the Minister's attention at the earliest opportunity.

Yours sincerely

Sinead Ryan

Private Secretary to the Minister for Trade, Employment, Business, EU Digital Single Market and Data Protection

Planted and Delin Protectory concernance westernoi a Augusta manatempi. Ramited and Delin Protectory concernance westernoi a Augusta manatempi.



Mr. Eamon Hutton Fehily Timoney & Company **Core House** Pouladuff Road Cork

# FEHILY TIMONEY & Co.

Distribution

1 6 JUL 2018

Job No: Correspondence No: Comment:

Dáta Date 13 July 2018

Ár dTag | Our Ref. TII18-102288

Bhur dTag Your Ref. P1694/Lett/EH/CF

EIAR Scoping Request for Waterford Airport Runway Extension at Killowen & Lisellan Co. Waterford on behalf of Waterford Regional Airport PLC

Dear Mr. Hutton,

RE:

Thank you for your correspondence of 22 June 2018 regarding the above EIAR scoping request. The position in relation to

National Strategic Outcome 2 of the National Planning Framework includes the objective to maintain the strategic capacity and safety of the national roads network. It is also an investment priority of the National Development Plan, 2018 – 2027, to ensure that the extensive transport networks which have been greatly enhanced over the last two decades, are maintained to a high level to ensure quality levels of service, accessibility and connectivity to transport

The issuing of this correspondence is provided as best practice guidance only and does not prejudice TII's statutory right to make any observations, requests for further information, objections or appeals following the examination of

The approach to be adopted by TII in making such submissions or comments will seek to uphold official policy and

guidance as outlined in the Spatial Planning and National Roads Guidelines for Planning Authorities (2012). Regard

In this instance, TII notes that the proposal is to consist of a runway widening and northern extension following a grant of planning permission under Reg. Ref. 1489 for runway extension to the south. It is outlined that commercial passenger flights ceased in 2016 and it is intended to recommence these flights that also require expanded terminal and car parking facilities.

With respect to EIAR Scoping issues, the recommendations indicated below provide only general guidance for the preparation of EIAR, which may affect the National Roads Network. The developer should have regard, inter alia, to

1. As set out in the Spatial Planning and National Roads Guidelines, it is in the public interest that, in so far as is reasonably practicable, that the national road network continues to serve its intended strategic purpose. The EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national

Próiseálann BlÉ sonraí pearsanta a sholáthraítear dó i gcomhréir lena Fhógra ar Chosaint Sonraí atá ar fáil ag www.tii.ie.

TIl processes personal data in accordance with its Data Protection Notice available at www.tii.ie.

Bonneagar lompair Éireann Ionad Gnó Gheata na Páirce Sráid Gheata na Páirce Baile Átha Cliath 8 Éire Dog Disto Éire, D08 DK10





road network in order to demonstrate that the development can proceed complementary to safeguarding the capacity, safety and operational efficiency of that network.

- 2. Clearly identify transport routes proposed and fully assess the network to be traversed. In relation to haul routes, separate structure approvals/permits and other licences may be required in connection with the proposed haul route and all structures on the haul route should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal load proposed.
- 3. Consultations should be had with the relevant Local Authority/National Roads Design Office with regard to locations of existing and future national road schemes.
- 4. It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site with reference to impacts on the national road network and junctions of lower category roads with national roads. TII's Traffic and Transport Assessment Guidelines (2014) should be referred to in relation to proposed development with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of the NRA/TII TTA Guidelines which addresses requirements for sub-threshold TTA.
- 5. The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required.
- Assessments and design and construction and maintenance standards and guidance are available at <u>TII</u> <u>Publications</u> that replaced the NRA Design Manual for Roads and Bridges (DMRB) and the NRA Manual of Contract Documents for Road Works (MCDRW).
- 7. The developer, in conducting Environmental Impact Assessment, should have regard to TII Environment Guidelines that deal with assessment and mitigation measures for varied environmental factors and occurrences. In particular;
  - a. TII's Environmental Assessment and Construction Guidelines, including the *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (National Roads Authority, 2006),
  - b. The EIAR should consider the Environmental Noise Regulations 2006 (SI 140 of 2006) and, in particular, how the development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (1<sup>st</sup> Rev., National Roads Authority, 2004)).
- 8. The Environmental Assessment should have regard to previous Environmental Assessment Statements/Reports and conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the area.

I trust that the above comments are of assistance in your EIAR preparation.

Yours sincerely,

Michael McCormack Senior Land Use Planner



# FEHILY TIMONEY & Co.

Distribution

2 4 JUL 2018

Job No: Correspondence No: Comment:



Ceann Oifig Sráid Jonathan Swift Baile Átha Troim Co. na Mí C15 NX36

Head Office Jonathan Swift Street Trim Co Meath C15 NX36

Fón/Phone: (0761) 10 6000 (046) 942 6000 Facs/Fax: (046) 948 1793 Íosghlao/LoCall 1890 213414 Suíomh gréasáin/website: www.opw.ie

le dea mhéin with compliments

Cork

Ref: 388-2018

Re: Waterford Airport Runway Extension. Environmental Impact Assessment Report/Environmental Impact Statement

Dear Mr. Hutton,

I refer to your recent letter regarding your preparation for Environmental Impact Assessment Report/Environmental Impact Statement.

I would refer you in this instance to "The Planning System and Flood Risk Management, Guidelines for Planning Authorities "published in November 2009.

Yours sincerely

Nora Carey Engineering Services, Administration Unit. July 23<sup>rd</sup> 2018

#### Tionól Réigiúnach an Deiscirt

Teach an Tionóil, Sráid Uí Chonaill, Pórt Láirge, Éire.



Ag cur chun cinn ár Réigiúin Promoting our Region

#### Southern Regional Assembly

Assembly House, O'Connell Street, Waterford, Ireland.

6ú Iúil, 2018.

Eamonn Hutton, Fehily Timoney & Company, Core House, Pouladuff Road, Cork.

A Chara,

#### **RE: Waterford Airport Runway Extension**

Further to your letter of 22<sup>nd</sup> June, 2018 regarding Environmental Scoping and Consultation for a proposed runway extension to Waterford Airport, I set out below the following observations of the Southern Regional Assembly.

The Southern Regional Assembly is currently in the process of preparing a Regional Spatial and Economic Strategies (RSES) for the Southern Region, which will provide a long-term strategic planning and economic framework for the development of the region and support the implementation of the National Planning Framework (*Project Ireland 2040*).

We note the location of Waterford Airport in relation to several designated sites under the EU Habitats Directive, including the Tramore Back Strand Special Protection Area(SPA) and Tramore Dunes and Backstrand Special Area of Conservation(SAC). In this regard, we would draw your attention to *Project Ireland 2040* – the *National Planning Framework* and, in particular, National Policy Objective 59 which refers to the requirement to implement EU Directives:-

#### **National Policy Objective 59**

Enhance the conservation status and improve the management of protected areas and protected species by:

- Implementing relevant EU Directives to protect Ireland's environment and wildlife;
- Integrating policies and objectives for the protection and restoration of biodiversity in statutory development plans;
- Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites;
- o Continued research, survey programmes and monitoring of habitats and species.

#### Tionól Réigiúnach an Deiscirt

Teach an Tionóil, Sráid Uí Chonaill, Pórt Láirge, Éire.



#### Southern Regional Assembly

Assembly House, O'Connell Street, Waterford, Ireland.

The RSES process commenced in November 2017 and several key reports have been prepared to date. We therefore would draw your attention to the following documents to assist the preparation of the Environmental Impact Assessment Report and Environmental Impact Statement:-

- RSES Issues Paper for the Southern Region (November 2017),
- RSES SEA Scoping Report (Dec 2017),
- Information supporting AA Screening document for RSES (May 2018).

In addition, the Regional Assembly considers that other plans and policies which should be considered in the preparation of the Environmental Impact Assessment Report and Environmental Impact Statement are:

- South-East Regional Planning Guidelines (RPG) 2010 2022 and RPG Environment Report & AA (2010) and
- Waterford City and County Council Development Plans and supporting SEA and AA.

Please do not hesitate to contact the undersigned should you wish to discuss further.

Mise le meas,

#### **Dominic Walsh**

Oifigeach Pleanála Réigiúnach / Regional Planning Officer

🖀: +353 (087) 296 2561 | 昌: +353 (0)51 879887 | 🖂: <u>dwalsh@southernassembly.ie</u> <u>www.southernassembly.ie</u>

Thu 28/06/2018 16:10

Ian Lumley <heritage@antaisce.org>

Response on Waterford Airport Runway Extension EIAR- Preliminary assessment and justification on basis of Climate impact

To Camon Hutton ① You forwarded this message on 11/07/2018 09:48.

IL

To : Eamon Hutton, Fehily Timoney and Co.

Re: Waterford Airport Runway Extension proposed by Waterford Regional Airport PLC

28 June 2018

Dear Mr Hutton,

Thank you for letter of 22nd June on preparation of EIA Report.

This proposal needs to be assessed and justified on the basis of Climate impact and mitigation as a preliminary matter.

In view of the increasing climate impact of jet aviation and the requirement to meet Paris Agreement climate targets, it is submitted that applications for new or extended runway capacity for jet aviation expansion are ethically, legally, scientifically and financially untenable. Furthermore it is submitted that any Environmental Impact Assessment process on increased jet aircraft runway capacity is incapable of mitigating climate impact and therefore cannot be compatible with the EIA Directive and would be exposed to legal challenge and action. On top of this it is a matter of simple economics that new runway capacity investment will be a wasted asset which will be unusable.

Current investment in resources needs to be focused in decarbonisation. In relation to Ireland and UK inter connectivity this means investment in rail electrification and increased rail speeds from renewable sources and development of new low carbon passenger ferry connections across the Irish Sea.

Aviation is one of the fastest growing sources of greenhouse gas (GHG) emissions and the most climate-intensive form of transport. Aviation emissions have more than doubled in the last 20 years and the sector is responsible for an estimated 4.9% of man-made global warming. An Tasice is affiliated to the Brusesl based NGO Transport and the Environment which campaigns with other actors, including members of the International Coalition for Sustainable Aviation (ICSA), for ambitious <u>global</u> and regional targets to reduce emissions within the aviation sector, for full inclusion of aviation in the European Union's (EU) strategy to meet its reduction targets, and for removing exemptions on fuel taxation and Value Added Tax (VAT) for airlines in the EU.

Under the United Nations Framework Convention on Climate Change (UNFCCC), emissions from international aviation are treated separately in national accounting. The 1997 Kyoto Protocol requested developed countries to work through the International Civil Aviation Organisation (ICAO) to limit and reduce emissions from the sector. After years of waiting for ICAO to take action in dealing with the aviation sector's climate impact, the EU agreed in 2008 that emissions from international aviation would be included in its emissions trading system (EU ETS) from 1 January 2012.

In October 2016 ICAO agreed on a global market-based measure to address the growth in CO2 emissions from international aviation above 2020 levels. The Carbon Offsetting and Reduction Scheme for International Aviation, or CORSIA, aims to stabilise CO2 emissions at 2020 levels by requiring airlines to offset the growth of their emissions after 2020. However, it will be voluntary from 2021-2027, potentially only have mandatory effect after 2027, and will, at a maximum, offset only 21.6% of international aviation emissions. The problems with offsetting have been made clear by a recent <u>European Commission study</u>. This study has found that 85% of the offset projects under the UN's Clean Development Mechanism (CDM) failed in the objective of reducing emissions. The aviation sector now runs the risk of repeating these mistakes by resorting to offsetting its emissions – particularly as rules governing the offsets' environmental integrity in CORSIA are unknown.

Even if offsetting can be made to work, it can only ever be a temporary solution as the Paris Agreement requires all sectors and all states to reduce their emissions, not just pay others to reduce theirs. The low cost of offsets and weak ambition of CORSIA will provide no incentive for the aviation sector to drive efficiency improvements. And in any case, the measure will not reduce fuel burn or the alarming growth rate of emissions. It is therefore essential that other global measures are agreed, especially measures that advance in-sector reductions, such as an efficiency standard for aircraft and ending subsidies.

While ICAO continues to set only minimal climate ambition, it is important that the EU including Ireland joins other developed regions and countries in showing leadership on this issue. The EU should therefore ensure that reductions in aviation sector emissions make a fair contribution to achieving the EU's overall 2030 climate target, and it should adopt measures that ensure the sector makes its fair contribution to reducing Europe's emissions. This includes ending <u>tax exemptions and subsidies</u> and investing in low-carbon alternatives.

For this reason the proposed Waterford project is not tenable since it seeks to cater to a continuing and increased aviation passenger demand which is not compatible with Paris Agreement targets. As an immediate priority a significant "frequent flier levy" is needed on the 10 to 15 percent of the population who take flights three or more times annually and who have a disproportionate climate impact.

Given that there is no "carbon space" to accommodate aviation expansion, we request that you as consultants advise Waterford Regional Airport PLC, that this application should not proceed.

Ian Lumley

Advocacy Officer

An Taisce - The National Trust for Ireland | <u>www.antaisce.org</u> The Tailors' Hall, Back Lane, Dublin 8, Ireland Company Reg. No. 12469 | Charity Ref. No. CHY4741 | Charity Regulator No. 20006358 An Taisce is a membership-based charity Join at <u>www.antaisce.org/membership</u>



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

# **APPENDIX 4-2**

Scoping Consultation Letter





#### CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES

Our Ref: P1694/Lett/EH/CF

«AddressBlock»

22<sup>nd</sup> June 2018

#### Re: Waterford Airport Runway Extension

«GreetingLine»

Waterford Regional Airport PLC have engaged Fehily Timoney and Company to prepare an Environmental Impact Assessment Report / Environmental Impact Statement for a proposed runway extension at Waterford Regional Airport. We are writing to invite you to identify the key points that you consider most important in the preparation of the EIAR/EIS for this project.

The existing airport is located in the townlands of Lisselan, Killowen, Ballygarran and Castletown, Co. Waterford. The airport has been in operation since the early 1980s and in 2008, at its peak, accommodated 4045 commercial flights with approximately 144,000 passengers. Commercial flights ceased operation at the airport in 2016.

The airport was granted planning permission in 2014, under Waterford County Council planning ref. 1489, to expand the southern end of the runway in a two-phased approach which consists of a total 375m extension.

The proposed development will comprise the lengthening of the northern section of the runway by approximately 500m and widening of the existing runway along its full length on either side by approximately 7.5m. Ancillary and associated works will include upgrading of the airport security fencing, new navigation lighting within airport lands and extending to adjacent lands, associated drainage works, additional parking spaces and an extension to main terminal building of approximately 700m<sup>2</sup>.

Key operational changes will include the accommodation of commercial jet aircraft such as the Boeing 737 and Airbus 320. This will impact on take-off and landing positions which will extend into the newly extended runway areas. The development aims to accommodate approximately 1700 commercial flights per annum by year five after construction.

The EIAR/EIS will assess the direct, indirect and cumulative impact of the runway extension and will include a Natura Impact Statement. A planning application will be made to Waterford City & County Council in due course.

Cont'd...



#### CORE HOUSE, POULADUFF ROAD, CORK, IRELAND

T: +353 21 4964133 F: + 353 21 4964464 E: info@ftco.ie W: www.fehilytimoney.ie Directors: Eamon Timoney David McHugh Bernadette Guinan Beren De Hora Company Secretary: Sinead Timoney Registered in Ireland, Fehily Timoney & Company Ltd. Number 180497 Registered Office: Core House, Pouladuff Road, Cork. VAT Registration Number: IE6580497D





Page 2

Figure 1, attached to this correspondence, illustrates the location of the existing airport and the key development for the proposed extension.

This letter is being issued to you as part of the scoping and consultation process for the EIAR/EIS. As part of the consultation process, we would be interested in receiving any comments you may have on the proposed development, relevant to your area of expertise, before 6<sup>th</sup> July 2018 in writing or be email to <u>eamon.hutton@ftco.ie</u>.

If you have no comments to make, I would be grateful if you would please acknowledge receipt of this letter.

Please find enclosed a site location map and a list of the assessments proposed for the EIAR/EIS.

If you have any queries regarding the project, please contact the undersigned.

Yours faithfully,

lamon Hantte

Eamon Hutton for and on behalf of **Fehily Timoney & Company** 

Fehily Timoney & Company, Core house, Pouladuff Road, Cork, T12 D773



# **Contents of EIAR/EIS**

Chapter 1 - Introduction

- Chapter 2 Description of the Proposed Development
- Chapter 3 Policy
- Chapter 4 Consultation
- Chapter 5 Population & Human Health
- Chapter 6 Land, Soils & Geology
- Chapter 7 Hydrology & Water Quality
- Chapter 8 Traffic & Transport
- Chapter 9 Landscape and Visuals
- Chapter 10 Air Quality & Climate
- Chapter 11 Noise & Vibration
- Chapter 12 Archaeology and Cultural heritage
- Chapter 13 Biodiversity
- Chapter 14 Alternatives
- Chapter 15 Interactions of the Foregoing




0.5 1 2



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

# **APPENDIX 6-1**

Site Investigation Results



IGSL Ref.		21068	3			Labora	atory tes	sting sch	edule -	Soils		CLIENT			Schedule No	1
Contract		Water	ford Airpor	t(FFA)	)							LAB			Date	02.07.18
				,								FILE			Signed	JC
Specific Instruc	tions:															
BH/TP No.	Sample Depth (Top)	Sample Depth (btm)	Sample Ref	Sample Type	Moisture Content	Atter berg limits	Sieve	Hydro	MCV	CBR tests	Quick Undrained Triaxial	Soil Sulphate	Soil Ph	Environmental Soil Test Suite	Remarks	
															1	
WC1	0.50	1.50	1700				-	-								
W51	0.50	1.50	1709	env								-		Sulphate, Sulphide, Nitrate, VOC's, TOC, PAH, TPH, Heavy metals (9), Ethylene Glycol	+	
WS2	0.50	1.50	1710	env										Sulphate, Sulphide, Nitrate, VOC's, TOC, PAH, TPH, Heavy metals (9), Ethylene Glycol		
WS3	0.50	1.50	11711	env										Sulphate, Sulphide, Nitrate, VOC's, TOC, PAH, TPH, Heavy metals (9), Ethylene Glycol		
-																
WS4	0.50	1.50	1712	env										Sulphate, Sulphide, Nitrate, VOC's, TOC, PAH, TPH, Heavy metals ( 9 ), Ethylene Glycol		
WS5	0.50	1.50	1713	env										Sulphate, Sulphide, Nitrate, VOC's, TOC, PAH, TPH, Heavy metals (9), Ethylene Glycol		
WS6	0.50	1.50	1714	env										Sulphate, Sulphide, Nitrate, VOC's, TOC, PAH, TPH, Heavy metals (9), Ethylene Glycol		
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		1	1	1			1	1	1		1		1		1	
			1													
BH/TP No.	Sample Depth (Top)	Sample Depth (btm)	Sample Ref	Sample Type	Moisture Content	Atter berg limits	Sieve	Hydro	MCV	CBR tests	Quick Undrained Triaxial	Soil Sulphate	Soil Ph	Environmental Water Test Suite	Remarks	
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												-				
WSI							-	-						pH, EC,TOC,BOD,COD,Alkalinity, Ammonia,Ortho Phosphate,Sulphate as SO4,Total Oxidized Nitrogem,Chlor	de Metahs (9),PAH,TPH &	¿ Ethlene Glycol
WC2							-									
w35			ł				-							pri, ec., toc., bob, cob, Aikannity, Ammonia, orino Phosphate, Sulphate as 504, total Oxidized Nitrogeni, chior	de Metans (9),PAH,IPH &	E Ethiene Giycol
WS4			-				-	-						eH_EC TOC BOD COD All/elinity: Ammonio Ortho Bhorehota Sulehota ee SO4 Totel Oxidized Niteeeom Chlor	ida Matalas (0) DAH TDH 8	Ethlana Gluaal
1134														pri, i.e., i.o.e., boby, oby, Aikanniny, Annionia (ofuto Filosphare, Surphare as 504, rotar Oxfutzeu Nitogeni, enor	de Metalls (9), rAII, ITTI &	e Editelle Giycol
WS6														nH FC TOC BOD COD Alkalinity. Ammonia Ortho Phoenhate Sulphate as SO4 Total Oxidized Nitrogem Chlor	ide Metabe (0) PAH TPH &	Ethlene Glycol
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			Total N	o. Of tests	0	0	0	0	0	0	0	0	0		-	



# **GEOTECHNICAL BORING RECORD**

REPORT NUMBER

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			II AO	0)			SPT HAN	T HAMMER REF NO						BY		P Allan	
ENC	GINEEF	<b>R</b> Fra	ank Fo	ox & Ass	sociates		ENERGY RATIO (%)				PROCESSED BY F.C			F.C			
ē									-	Ê		San	nples				e
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0	TOP	SOIL					/	<u></u>		0.10							$\mathbb{N}$
	Firm	Firm brown sandy SILT/CLAY with gravel					X- X- 0			AA91035	в	0.50					
1								X			AA91036	В	1.00		(1	N = 11 , 2, 2, 3, 3, 3)	
2								X		2.50	AA91037	в	2.00		(2	N = 8 , 3, 2, 2, 2, 2, 2)	0 0
3	Stiff t occas	o very sti sional col	ff gre bbles	y sandy	y gravelly C	LAY with	1				AA91038	в	3.00		(4	N = 29 , 6, 6, 8, 8, 7)	0 0 0
1											AA91039	в	4.00		(6, 8	N = 47 , 10, 10, 12, 15)	0 0
5	Obstr End o	ruction of Boreho	ole at	4.80 m				<u>0</u>		4.80					N	= 50/75 mm (25, 50)	
3																	
,																	
3																	
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NS	TALLA	TION DE	TAIL	S				Date	e	Hole	Casing	De	pth to	Comme	ents		
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Soaka	away D	esign f -value from fie	eld tests	(F2C) IGSL
Contract:	Waterford	Airport	Contract No.	21068
Test No.	STP01			
Client	Waterford	County Council / FAAEng		
Date:	26/06/20	18		
Summary	of ground c	onditions		
from	t0	Description		Ground water
0.00	0.10			Slight seepage at
0.10	0.40	MADE GROUND: Light brown gravelly very silty	clay with frequent granular	1.9m
0.40	1.30	Very stiff light brown gravelly very slity CLAY		
1.50	1.00	Very suil mouled brown/orange/grey/black grave	eny very siny CLAY	
Notes:	1.90	Sun mouled brown/orange/grey/black gravely ve	ery silly CLAY with coddles	
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(m)	(min)	Length of Pit (L)	2.00	m
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0.50	2 00	Final depth to wa	ter = 0.50	m
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0.50	8.00	Top of permeable	e soil	lm
0.50	10.00	Base of permeab	le soil	m
0.50	12.00			1
0.50	15.00			
0.50	20.00			
0.50	25.00			
0.50	30.00	Base area=	1	lm2
0.50	35.00	*Av. side area of permeable stratum over te	est perio 7	m2
0.50	40.00	Total Exposed an	ea = 8	m2
0.50	45.00			4
0.50	50.00			
0.50	60.00	Infiltration rate (f) = Volume of water	used/unit exposed area	/ unit time
0.50	70.00			
0.50	80.00	f= 0 m/min or	0	m/sec
0.50	90.00			
	00.00	Depth of water vs Elapsed Time (r	nins)	
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ji ži			•	
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	5.00	Denth to Water (m)		

Soaka	away D	Design f-valu	le from	field to	ests	(F2C) IGSL
Contract:	Waterford	Airport			Contract No.	21068
Test No.	STP02					
Client	Waterford	County Council / FAAEng				
Date:	26/06/20	018				
Summary	of ground of	conditions				
from	to	Description				Ground water
0.00	0.20	TOPSOIL				Slight seenage at
0.20	1.20	Stiff-very stiff mottled light br	own/grey gravel	lly very silty	CLAY	2m
1.20	2.00	Stiff brown slightly sandy gra	velly silty CLAY	with low col	bble content	
						4
Notes:						
<u>Field Data</u>			<u>Field Test</u>			
Depth to	Elapsed	]	Depth of Pit (	(D)	2.00	m
Water	Time		Width of Pit (	B)	0.50	m
(m)	(min)		Length of Pit	(L)	2.00	m
		4			<b>A F C</b>	- I
0.50	0.00	4	Initial depth t	o Water =	0.50	lm
0.50	2.00	4	Final depth to	water =	0.50	lm
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0.50	10.00	-	Base of perme	eable soil		- Im
0.50	12.00	-	base of perm		l	]
0.50	15.00					
0.50	20.00	1				
0.50	25.00	]				
0.50	30.00	]	Base area=		1	m2
0.50	35.00	*Av. side area of permeab	le stratum ove	er test perio	7.5	m2
0.50	40.00	4	Total Exposed	d area =	8.5	_m2
0.50	45.00	4				
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0.50	70.00		volume or wa			
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Soaka	away D	Design f-val	ue fron	n field t	ests	(F2C) <b>IGSL</b>
Contract:	Waterford	Airport			Contract No.	21068
Test No.	STP03					
Client	Waterford	County Council / FAAEng				
Date:	26/06/20	)18				
Summary	of ground c	conditions				
from	to	Description				Ground water
0.00	0.10	TOPSOIL				
0.10	0.30	Very stiff light brown gravell	y very silty CL	<u>AY</u>	hla a su ta u t	- Pit remained dry
0.30	0.90	Stiff mottled brown/grey gra	Velly slity CLA		ble content	_
0.90	1.10	Stiff to very stiff green/grey	slightly slity gi		CLAV with appha	
Notes:	2.00	Suit mouled brown/grey slig	nuy sandy sin	y very gravelly	CLAY WILL CODDIE	15
<u>Field Data</u>			Field Test			
Denth to	Flansed	1	Denth of P	it (D)	2.00	Лm
Water	Time		Width of P	it (B)	0.50	
(m)	(min)		Length of	$D_{i+}(I)$	2.00	
(11)	(11111)		Length of	FIL (L)	2.00	
0.50	0.00	1	Initial dent	h to Water -	0.50	Пm
0.50	2.00	4	Final dept	to water -	0.50	
0.50	4 00	1	Flansed tin	me(mins) =	90.00	
0.50	6.00	1	Elapsed th			
0.50	8.00	-	Top of per	meable soil		Πm
0.50	10.00	1	Base of pe	rmeable soil		- '''  m
0.50	12.00	-	Duse of pe		L	
0.50	15.00	-				
0.50	20.00	1				
0.50	25.00	1				
0.50	30.00	1	Base area=		1	]m2
0.50	35.00	*Av. side area of permeal	ole stratum o	over test perio	7.5	m2
0.50	40.00	1	Total Expo	sed area =	8.5	m2
0.50	45.00	1			1	_
0.50	50.00					
0.50	60.00	Infiltration rate (f) =	Volume of	water used/u	nit exposed are	a / unit time
0.50	70.00					
0.50	80.00	f= (	) m/min	or	C	) m/sec
0.50	90.00					
		Depth of water	vs Elapsed 1	īme (mins)		
	00.00					
	90.00				•	
(st	80.00				•	
air	70.00				•	
le(I					•	
Light					•	
Ň	50.00				•	
bse	40.00				•	
Ela	30.00					
_	20.00					—
	10.00 +				<b>Ĭ</b>	
	0.00	1			<b>Ŧ</b>	
	0.00	0.10 0.20	0.30	0.40	0.50	0.60
		De	pth to Wate	r (m)		

Soaka	away D	)esign f-val	ue from fie	eld tests	(F2C) IGSL
Contract:	Waterford	Airport		Contract No.	21068
Test No.	STP04	0 1 0 1 / 5445			
Client Data:	Waterford	County Council / FAAEng			
Summary	of ground of	conditions			
from	to	Description			Ground water
0.00	0.60	MADE GROUND: Light bro	wn gravelly very si	ilty clay with granular fill	
0.60	1.30	Very stiff light brown gravel	y very silty CLAY wit	th medium cobble content	Pit remained dry
1.30	2.00	Stiff mottled brown/orange/l	olack gravelly very si	Ity CLAY with low cobble c	q
					_
Notes:					
E LI D. L					
Field Data	<u>.</u>		Field Test		_
Depth to	Elapsed		Depth of Pit (D)	2.00	lm
Water	Time		Width of Pit (B)	0.50	lm 
(m)	(min)		Length of Pit (L)	2.00	Jm
0.50	0.00	1	Initial depth to M	ater = 0.50	lm
0.50	2.00	-	Final depth to wa	ater = 0.50	lm
0.50	4.00		Elapsed time (mi	ns)= 90.00	1
0.50	6.00	]		·	_
0.50	8.00	]	Top of permeable	e soil	]m
0.50	10.00	-	Base of permeab	le soil	lm
0.50	12.00	-			
0.50	15.00				
0.50	25.00	-			
0.50	30.00	-	Base area=	1	lm2
0.50	35.00	*Av. side area of permeal	ble stratum over te	est perio 7.5	m2
0.50	40.00	]	Total Exposed ar	ea = 8.5	m2
0.50	45.00				
0.50	50.00				( ····
0.50	60.00	Infiltration rate (f) =	Volume of water	used/unit exposed area	a / unit time
0.50	70.00				
0.50	80.00	T= (	m/min or	· 0	m/sec
0.50	90.00				
		Depth of water	vs Elapsed Time (I	mins)	
	100.00				
s)	80.00				
nin	70.00			•	
e(r				•	
L E				•	
, S	10.00			•	
l sqi	40.00			•	
Ela	30.00			*	
	20.00			* *	
	10.00				
	0.00	0 10 0 20	0 30		0.60
	0.00	0.10 0.20	0.50	0.10 0.30	0.00
		De	pth to Water (m)		

Soaka	way D	esign f -value from field	tests	(F2C) IGSL
Contract:	Waterford	Airport	Contract No.	21068
Test No.	STP05			
Client	Waterford	County Council / FAAEng		
Date:	26/06/20	18 anditions		
from		Description		Ground water
0.00	0.20	TOPSOIL		
0.20	0.60	Very stiff light brown slightly gravelly very silty CLAY		Slight seepage at
0.60	1.30	Stiff mottled brown/black slightly sandy gravelly very	silty CLAY with cobble	2m
1.30	2.00	Firm-stiff mottled brown/grey/black gravelly very silty	CLAY with cobbles	
Notes:				
<u>Field Data</u>		Field Test		
Depth to	Elapsed	Depth of Pit (D)	2.00	]m
Water	Time	Width of Pit (B)	0.50	m
(m)	(min)	Length of Pit (L)	2.00	m
0.50	0.00	Initial dapth to Wate	r - 0.50	]m
0.50	2.00	Final depth to water	- 0.50	m
0.50	4.00	Flapsed time (mins)-	- 90.00	
0.50	6.00			1
0.50	8.00	Top of permeable so	il	lm
0.50	10.00	Base of permeable so	pil	m
0.50	12.00		T.	-
0.50	15.00			
0.50	20.00			
0.50	25.00		1	1 0
0.50	30.00	Base area=		m2
0.50	40.00	AV. Side area of permeable stratum over test p	erio 7.5	m2
0.50	45.00		0.5	]
0.50	50.00			
0.50	60.00	Infiltration rate (f) = Volume of water use	d/unit exposed area	/ unit time
0.50	70.00		·	
0.50	80.00	f= 0 m/min or	0	m/sec
0.50	90.00			
		Depth of water vs Elapsed Time (mins	)	
1	00.00			
	90.00		•	—
ins	80.00		•	
E E	70.00		•	_
l m	60.00		•	
	50.00		•	_
sec	40.00			
lap	30.00		•	
	20.00			
	10.00		<b>i</b>	
	0.00	1 1 1 1	<b>Ŧ</b>	
	0.00	0.10 0.20 0.30 0.4	0 0.50	0.60
		Depth to Water (m)		

	3SL	
CON	TRACT	Waterford Airport
LOG	GED BY	DE
CLIE ENGI	NT NEER	Waterford County Council FAAEng
		Geotechnical Descrip
0.0	TOPSO	IL
-	MADE C	GROUND: Light brown gravell t granular fill

## TRIAL PIT RECORD

REPORT NUMBER

JUN	TRACT	Waterford Airport						SHEET	II NO.	TP0 Shee	<b>1</b> et 1 of 1	
LOG	GED BY	DE	CO-ORDINAT	ES	662,682.57 E 604,940.59 N			DATE STARTED 26/0 DATE COMPLETED 26/0			6/2018 6/2018	
CLIE ENGI	NT INEER	Waterford County Council FAAEng	GROUND LEV	/EL (m)	35.07			EXCAVATION METHOD		JCB	JCB 3CX	
									Samples	6	Pa)	
		Geotechnical Descriptio	n	Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KF	
0.0		IL GROUND: Light brown gravelly y	erv silty clay with		0.10	34.97						
	frequent	i granular fill						AA90840	В	0.30-0.40		
	MADE G	GROUND: Geotextile net	/	××××× -ו	0.40 0.41	34.67 34.66			_			
	subroun	f light brown gravelly (fine-mediu ded-angular) very silty CLAY	m,					AA90841	В	0.60-0.70		
1.0								AA90842	В	1.00-1.10		
	Very stifi (fine-me	f mottled brown/orange/grey/blac dium, subrounded-angular) very	k gravelly silty CLAY		1.30	33.77		AA90843	В	1.40-1.50		
	Stiff mot	ttled brown/orange/grey/black gra dium, subrounded-angular) very	avelly silty CLAY with		1.80 1.90	33.27 33.17		AA90844	В	1.80-1.90		
2.0	End of T	cobble (subrounded-angular) co rial Pit at 1.90m	ntent /				(000page)					
<b>Grou</b> Sligh	<b>Indwater C</b> It seepage	Conditions e at 1.9m										
Stab Pit re	<b>ility</b> emained st	table										
<b>Gene</b> Soak	e <b>ral Rema</b> i kaway pit	rks										

		т		RECO	RD						REPORT NUMBER		
	GSL									210	)68		
CON	ITRACT	Waterford Airport						TRIAL P	AL PIT NO. TP02				
LOG	GED BY	DE	CO-ORDINATES 662,501.43 E 604,451.25 N					Sheet 1 of 1           DATE STARTED         26/06/2018           DATE COMPLETED         26/06/2018					
CLIE	INEER	Waterford County Council	GROUND LEVEL (m) 27.69					EXCAVA METHO	ATION D	JCB :	JCB 3CX		
	Since i rocking									es	(a)		
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KP		
0.0 - - -	TOPSO Stiff-very (fine-coa	IL y stiff mottled light brown/grey grave arse, subrounded-angular) very silty	lly CLAY		0.20	27.49							
-								AA90823	В	0.50-0.60			
- 1.0 -	Stiff brow	wn slightly sandy (coarse) gravelly (f ded-angular) silty CI AY with low col	ine-coarse,		1.20	26.49		AA90824	В	1.00-1.10			
-	(subrour	nded-angular) content						AA90825	В	1.50-1.60			
2.0	End of T	rial Pit at 2.00m		X 0 0 	2.00	25.69	(Seepage)	AA90826	В	1.90-2.00			
-													
<b>Gro</b> u Sligh	undwater ( nt seepage	Conditions e at 2m											
Stab	oility												
Pit r	emained s	table											
Soal	General Remarks Soakaway pit												

est p	
IGSL	/

# **TRIAL PIT RECORD**

REPORT NUMBER

CON	ITRACT	Waterford Airport						TRIAL P	IT NO.	TP0 Shee	<b>3</b> et 1 of 1
LOG	GED BY	DE	CO-ORDINAT	ES	662,3 603,9	32.01 E 91.04 N		DATE ST DATE CO	TARTED	26/06 ED 26/06	5/2018 5/2018
CLIE	ENT	Waterford County Council FAAEng	GROUND LE	VEL (m)	25.84			EXCAVA METHOD	ATION D	JCB	3CX
		Geotechnical Description					e		Samples		(KPa)
				Legend	Depth (m)	Elevation	Water Stri	Sample Ref	Type	Depth	Vane Test
0.0	TOPSO Very stit	IL ff light brown gravelly (fine-medium,			0.10	25.74					
-	subrounded-angular) very silty CLAY         Stiff mottled brown/grey gravelly (fine-coarse, subrounded-angular) silty CLAY with low cobble (subrounded-angular) content         1.0         Stiff to very stiff slightly organic green/grey slightly silty gravelly (fine-medium, subrounded-angular) CLAY         Stiff mottled brown/grey slightly sandy (medium-coarse) silty very gravelly (medium-coarse, subrounded-angular) CLAY with medium cobble (subrounded-angular) content				0.30	25.54		AA90832	В	0.50-0.60	
- - 1.0 -					0.90	24.94 24.74		AA90833	В	1.00-1.10	
-	Stiff mottled brown/grey slightly sandy (medium-coarse) silty very gravelly (medium-coarse, subrounded-angular) CLAY with medium cobble (subrounded-angular) content							AA90834	В	1.40-1.50	
	End of 1	Frial Pit at 2.00m			2.00	23.84		AA90835	В	1.90-2.00	
Gro Pit r	roundwater Conditions it remained dry										
Pit r	<b>oility</b> emained s	table									
Gen	<b>eral Rema</b> kaway pit	rks									

	a form							REPORT NU	JMBER		
	TRIAL PIT RECORD										)68
CON	TRACT	Waterford Airport						TRIAL P	IT NO.	TP04	<b>1</b>
LOG	GED BY	DE	CO-ORDINAT	ËS	662,3 604,2	89.24 E 73.66 N		DATE ST	TARTEI OMPLE	D 26/06	/2018 /2018
CLIE ENGI	NT	Waterford County Council FAAEng	GROUND LEV	/EL (m)	26.85			EXCAVA METHOD	TION	JCB 3	BCX
									Sample	es	a)
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KP
0.0	MADE GROUND: Light brown gravelly very silty clay with frequent granular fill Very stiff light brown gravelly (fine-medium, subrounded-angular) very silty CLAY with medium cobble (subrounded-angular) content				0.60	26.25		AA90827	В	0.30-0.40	
	Very stif subroun (subrour	Very stiff light brown gravelly (fine-medium, subrounded-angular) very silty CLAY with me (subrounded-angular) content Stiff mottled brown/orange/black gravelly (fine subrounded-angular) very silty CLAY with low (subrounded-angular) content	nedium cobble			20.23		AA90828	В	0.70-0.80	
1.0	05%				1.30	25.55		AA90829	В	1.00-1.10	
	subroun (subrour		ne-coarse, w cobble		- - - - -			AA90830	В	1.50-1.60	
2.0	End of T	rial Pit at 2.00m		X	2.00	24.85		AA90831	В	1.90-2.00	
<b>Grou</b> Pit re	Indwater ( Emained d	Conditions ry									
Stab	ility	table									
Pit re	mained s										
Gene Soak	e <b>ral Rema</b> away pit	rks									

/	1									REPORT NU	JMBER
	BSL		21(	068							
CON	TRACT	Waterford Airport						TRIAL P	IT NO.	TP0	5
			CO-ORDINA	TES	662,1	23.79 E		BHEET	ARTE	Shee 26/06	t 1 of 1 5/2018
_00	GED BI	DE		NEL (m)	603,3	81.07 N		DATE CO	OMPLE	<b>TED</b> 26/06	/2018
CLIE Engi	INEER	Waterford County Council FAAEng	GROUND LE		24.70			EXCAVA METHOD	TION D	JCB (	3CX
									Sample	es	a)
		Geotechnical Description				5	Strike				est (KF
				Legenc	Depth (m)	Elevati	Water 3	Sample Ref	Type	Depth	Vane T
0.0	TOPSO	IL		$\frac{\underline{x^{1}}_{1}}{\underline{y}} \cdot \underline{x^{1}}_{1}$							
	Very stif	f light brown slightly gravelly (fine-r	nedium,		0.20	24.50					
	subangu	liar) very slity CLAY			5					0 40 0 50	
								AA90836	В	0.40-0.50	
	Stiff mot gravelly	tled brown/grey/black slightly sand (fine-coarse, subrounded-angular)	y (coarse) very silty		0.60	24.10					
	ČLAY w	ith low cobble (subrounded-subang	gular) content	 	5						
1.0								AA90837	В	1.00-1.10	
				 XO	1 30	23.40					
	Firm-stif subroun	f mottled brown/grey/black gravelly ded-angular) very silty CLAY with le	/ (fine-coarse, ow cobble	- <u>×</u> ×	1.00	20.40					
	(Subioui	lueu-subangular) coment			5			AA90838	В	1.50-1.60	
					-						
2.0	End of T	rial Pit at 2 00m		x	2.00	22.70		AA90839	В	1.90-2.00	
Grou	indwater (	Conditions									
Sligr	it seepage	at 2m									
<b>Stab</b> Pit re	<b>ility</b> emained s	table									
Gene	eral Rema	rks									
Soak	kaway pit										

	IGSL Limited								REP	ORT NL	IMBER	1
	JSL .		WI	NDOW	SAMPL	E REC	ORD			210	)68	
CON	TRACT Waterford Airport						BH NO.			WSO	1	
co-0	DRDINATES(_) 662,682 E 604,935 N	GROUND LE	EVEL	(mOD)	34	4.97	DATE D	RILLEI OGGE	D D	27/06 27/06	/2018 /2018 /2018	
CLIE ENG	NT Waterford Airport INEER DE		_				DRILLE	D BY D BY		DW		
Depth (m)	Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Ref. Number	Sample Type	Depth (m)
0.0	TOPSOIL - brown sandy clay		1/ 1/ 1/ 1/				0.00-1.00	100	138 blow	s		
-	MADE GROUND - grey silty SANDY fill.			0.20	34.77							
-	Stiff to very stiff mottled brown/black/orange slightly s very silty CLAY. Gravel is medium with subangular cl mudstone.	andy gravelly ast of	×1×1,1×1,7,1×1	0.40	34.57						ENV	0.50-1.00
- 1.0 - - -	Stiff to very stiff, mottled brown/orange/black. Slightly silty CLAY. Gravel is medium with subangular clasts of	sandy gravely of mudstone.	<u>   \$  ' ' ' '  </u>	1.00	33.97		1.00-2.00	100	174 blow	s		
-	Dense brown sandy very clayey GRAVEL. Angular to clasts, fine to medium clasts of mudstone.	o subangular		1.55	33.42						ENV	1.50-2.00
2.0	Dense brown sandy very clayey GRAVEL. Angular to clasts, fine to medium clasts of mudstone.	o subangular		2.00	52.51		2.00-3.00	100	152 blow	S		
- 3.0 - -	Possibly highly weather rock recovered as slightly ora slightly sandy clayey GRAVEL. Subangular to subrou medium. Rock likely a weak siltstone/mudstone.	angish brown unded fine to	0 0 0 0 0 0 0	3.00	31.97		3.00-3.50	80				
	Final Depth 2.60m		ò	3.40	31.57							
Gene	eral Remarks											
Insta	Ilations											

	IGSL Limited		WI	NDOW	SAMPL	E REC	ORD		REP	ORT NU 21(	1 <b>MBER</b>	2
CON	TRACT Waterford Airport						BH NO.			WSO	2	
CO-(	DRDINATES(_) 662,505 E 604,456 N	GROUND LE	EVEL	(mOD)	2	7.66	DATE D	RILLE	D D	Sheet 27/06 27/06	21 of 2 /2018 /2018	
CLIE	NT Waterford Airport	-					DRILLE	DBY				
ENG							LUGGE				Sampl	es
Depth (m)	Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Ref. Number	Sample Type	Depth (m)
0.0 - -	TOPSOIL - brown sandy clay Stiff to very stiff brown sandy gravely CLAY. Gravel is subrounded, fine to coarse. Sand is fine to coarse. Cl mudstone and siltstone.	s subangular to asts are	.   ×	0.10	27.56		0.00-1.00	100	121 blow	S		
- - - - - - - - - - - - - -	Stiff to very stiff brown sandy gravely CLAY. Gravel is subangular to subrounded, fine to coarse. Sand is fine to coarse. Clasts are mudstone and siltstone.			1.00	26.66	-	1.00-2.00	0	147 blow	6	ENV	0.50-1.00
	Stift to very stift brown sandy gravely CLAY. Gravel is subangular t subrounded, fine to coarse. Sand is fine to coarse. Clasts are mudstone and siltstone.										ENV	1.50-2.00
- 2.0 - - - - - - - -	Stiff to very stiff mottled brown and black sandy grave Gravel is subangular to subrounded, fine to coarse cl mudstone and red siltstone. Sand is fine to coarse.	ely CLAY. lasts of black	<u> \$ \$ ` ` \$ `</u> 9` \$ ` \$  <u>\$</u>	2.00	25.66	_	2.00-3.00	100	132 blow	s		
- - - - - - - -	Stiff to very stiff mottled brown black slightly sandy gravely CLAY. Gravel is subangular to subrounded and fine to coarse clasts are black mudstone and red siltstone. Sand is fine to coarse.			3.00	24.66	_	3.00-4.00	100	137 blow	S		
Gen	Final Depth 4.00m eral Remarks											
	Illations											

/	IGSL Limited									REP	ORT NU	MBER	1	
	2 []©	isl /			WI	NDOW	SAMPI	LE RECO	ORD			210	68	
С	ΟΝΤ	RACT Water	ford Airport						BH NO.			WS0	2	
С	0-0	RDINATES( _)	662,505 E 604,456 N	GROUND LE	VEL	(mOD)	2	7.66	DATE D	RILLEI OGGE	D D	27/06 27/06	2 of 2 /2018 /2018	
CI	LIEN	NT Wate	ford Airport						DRILLEI	D BY				
Eľ	NGII	NEER DE							LOGGE	DBY		DW	Sampl	00
Douth (m)	(III) IIIdari		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Ref. Number	Sample Type	Depth (m)
4.	.0					4.00	23.66							
- - - - - - - - - - - - - - - - - -	.0													
- - - - - - - -	.0													
- - - - -	.0													
G	ene	ral Remarks												
	stal	lations												

	SSL COLLINATED		WI	NDOW	SAMPL	E RECO	ORD		KEP	210	)68	L
CON	TRACT Waterford Airport						BH NO.			WS0	<b>3</b>	
CO-0	DRDINATES(_) 662,391 E 604,278 N	GROUND LE	VEL	(mOD)	20	6.74	DATE D DATE L	RILLE	D D	27/06	/2018 /2018	
CLIE ENG	NT Waterford Airport INEER DE						DRILLE	D BY D BY		DW		
							()				Sampl	es
Depth (m)	Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Ref. Number	Sample Type	Depth (m)
0.0	TOPSOIL - Brown sandy clay		<u>\\</u> 1/ \\				0.00-1.00	100	81 blow	s		
-	Stiff to very stiff mottled brown-reddish purple slightly s CLAY. Gravel is subangular to subrounded, fine to coa mudstone. Sand is medium to fine.	sandy gravely ares of	1.1.1.1.1.1.1.1.1.	0.30	26.44						ENV	0.50-1.00
- - - - - -	Stiff to very stiff mottled brown-reddish purple slightly s CLAY. Gravel is subangular to subrounded Coarse to mudstone. Sand is medium to fine.	sandy gravely fine clast of	<u>ון וישן ויישן ו</u>	1.00	25.74		1.00-2.00	100	117 blow	s		
2.0	Stiff to very stiff mottled brown/balck gravely CLAY. G coarse angular to subangular Clasts of mudstone.	ravel is fine to	<mark>                                     </mark>	2.00	24.74	_	2.00-3.00	100	135 blow	s	ENV	1.50-1.00
-	Stiff to very stiff mottled brown/black/grey very gravely Gravel is fine to coarse subangular to subrounded clas and siltstone.	CLAY. st of mudstone	×  ¦   \$ \$	2.50	24.24							
- - - - -	Stiff to very stiff mottled brown balck gravely CLAY. Gr to subangular, fine to coarse clasts of mudstone and s	ravel is angular siltstone.	<u>  ×  '    ×                           </u>	3.00	23.74	_	3.00-3.60	80				
-	Possibly weatherd MUDSTONE dark grey.		000	3.40	23.34							
	Final Depth 3.60m			3.60	23.14							
Gene	General Remarks Installations											

	IGSL Limited								REP	ORT NU	IMBER	2
	JSL .		WI	NDOW	SAMPL	E REC	ORD			210	068	
CON	TRACT Waterford Airport	1					BH NO.		1	WS0	4	
			VFI	(mOD)	2	6.81	SHEET			Sheet	t 1 of 2	
0-0	604,278 N			(1102)	21	0.01	DATE L	OGGE	D	27/06	/2018	
CLIE ENG	NT Waterford Airport INEER DE						DRILLE	D BY		DW		
											Sampl	es
Depth (m)	Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Ref. Number	Sample Type	Depth (m)
0.0	TOPSOIL - brown sandy clay		<u>\\\</u>				0.00-1.00	90	125 blow			
F	MADE GROUND - Grey silty SANDY fill.		$\mathbb{X}$	0.20	26.61				51011			
-												
	MADE GROUND Brown loose sandy GRAVEL		$\bigotimes$	0.55	26.26						ENV	0.50-1.00
+	MADE GROUND. Brown gravely clay fill.			0.65	26.16							
1.0	MADE GROUND. Mottled gray/brown silty granular SA	ND fill.	×	1.00	25.81		1.00-2.00	100	158			
ļ									blow	s		
+	Stiff to very stiff mottled brown/black coarse sandy grav	vely CLAY.	<u> </u>	1.30	25.51							
Ę	Gravel is angular to subangular, fine to medium clasts mudstone. Sand is fine to medium.	of									ENV	1.50-2.00
F			-0-									
F												
-				2.00	24.01							
2.0	Very stiff grey gravely sandy CLAY. Gravel is subangul medium clasts of mudstone. Sand is fine to medium.	lar, fine to	-  -	2.00	24.01		2.00-3.00	100	131 blow	s		
L	Soft to firm brown gravely CLAY with subangular clast fine to medium.	of Mudstone		2.10	24.00							
+												
Ĺ												
-		dia ana ang ikaka		2.73	24.08							
ļ	weathered rock (mudstone) platy subangular clasts.	ang possibly										
3.0	Stiff mottled brown/red sandy CLAY surrounding possil	bly weathered		3.00	23.81		3.00-4.00	70				
F	rock (mudstone) platy subangular clasts.		-									
F	Blacky grey possibly weatherer rock GRAVEL (mudsto	ne) with slatty	0,	3.30	23.51							
F	fractures filled with supergene muddy deposits in the to	op 30cm.	Æ									
			00									
			80									
			Q.									
Gen	Final Depth 3.80m eral Remarks											
7000												
j Insta	llations											

	IGSL Limited									REP	ORT NU	MBER	2	
	35L				WI	NDOW	SAMPI	LE RECO	ORD			210	68	
COI	NTRACT	Wate	erford Airport						BH NO.			WS0	4	
co-	ORDINAT	ES( _)	662,391 E 604,278 N	GROUND LE	VEL	(mOD)	2	6.81	DATE D	RILLEI OGGE	D D	27/06 27/06	/2018 /2018 /2018	
CLI	ENT	Wate	erford Airport						DRILLEI	DBY				
ENC	SINEER	DE							LOGGE	DBY		DW		
									٥				Sampl	es
th (m)			Geotechnical Description		end	÷	ation	er Strike	th of Samp (m)	overy (%)	vcount	lber	ple e	÷
Dep					Lege	Dep (m)	Elev	Wate	Dep Run	Reo	Blov	Ref. Num	Sam Type	(m) Depi
4.0						4.00	22.81							
-														
F														
ł														
-														
5.0														
-														
ŀ														
F														
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6.0														
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ł														
-														
-														
7.0														
ŀ														
ļ														
ŀ														
Ger	eral Rema	arks												
1000														
OAIMI														
u lnet	allations													
2														

C.	IGSL Limited		WI	NDOW	SAMPL		ORD		REP	0RT NU		2
							PUNO			210		
CON	<b>TRACI</b> Waterford Airport	1					SHEET			Sheet	1 <b>5</b> t 1 of 1	
co-0	DRDINATES(_) 662,126 E 603,389 N	GROUND LE	EVEL	(mOD)	24	4.77	DATE D DATE L	RILLE OGGE	D D	27/06 27/06	/2018 /2018	
CLIE ENG	NT Waterford Airport INEER DE						DRILLE	D BY D BY		DW		
		1					0				Sampl	es
Depth (m)	Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Ref. Number	Sample Type	Depth (m)
0.0	TOPSOIL - Brown sandy clay		<u>\\</u> // \\				0.00-1.00	100	135 blow	s		
-	Stiff to Very stiff sandy gravely CLAY mottled (black/c Gravel is fine to medium subangular to subrounded o Mudstone. sand is fine to coarse.	prange/brown). clasts of		0.20	24.57						ENV	0.50-1.00
- - - - - -	Stiff to Very stiff sandy gravely CLAY mottled (black/orange/brow) Gravel is fine to medium subangular to subrounded clasts of mudstone. Sand is fine to coarse.			1.00	23.77	-	1.00-2.00	100	162 blow	s		
- 2.0	Stiff to Very stiff sandy gravely CLAY mottled (black/o Gravel is fine to medium subangular to subrounded o mudstone. sand is fine to coarse. End of the core sm compitent purple/red siltstone possible solid rock.	orange/brown). lasts of all lens of		2.00	22.77		2.00-2.60	50			ENV	1.50-2.00
-	Final Depth 2.60m		<u>-x-</u>	2.60	22.17	-						
- 3.0												
Gene	eral Remarks											
Insta	illations											

	IGSL Limited		WI	NDOW	SAMPL	E REC	ORD		REP	ORT NU 210	IMBER	1
CON	TRACT Waterford Airport						BH NO.			WS0	6	
co-0	DRDINATES(_) 662,151 E 603,665 N	GROUND LE	EVEL	(mOD)	20	6.19	DATE D DATE L	RILLE	D D	27/06 27/06	/2018 /2018	
CLIE ENG	NT Waterford Airport						DRILLE	D BY D BY		DW		
Depth (m)	Geotechnical Description		-egend	Depth (m)	Elevation	Nater Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Ref. Number	Sample Type	Depth m)
0.0 - - - - - -	TOPSOIL - Brown sandy clay Stiff to very stiff mottled brown/orange/black sandy gra Gravel is subangular to subrounded fine to coarse cla mudstone and siltstone. Sand is fine to coarse.	avely CLAY. sts of		0.20	25.99		0.00-1.00	100	109 blow	s	ENV	0.50-1.0
- - - - - - -	Stiff to very stiff mottled brown/orange/black sandy gra Gravel is subangular to subrounded fine to coarse cla mudstone and siltstone. Sand is fine to coarse.	avely CLAY. sts of	<u>  \$  '  \$  '  \$  \$  \$  \$  \$  \$  \$  \$  \$ </u>	1.00	25.19		1.00-2.00	100	94 blow	S	ENV	1.50-2.0
- 2.0	Stiff to very stiff mottled brown/orange/black sandy gra Gravel is subangular to subrounded fine to coarse cla mudstone and siltstone. Sand is fine to coarse.	avely CLAY. sts of	<u>                                     </u>	2.00	24.19	-	2.00-3.00	100	137 blow	S		
-	Black possibly heavly weathered rock MUDSTONE su brown clay infil.	urrounded with		2.80	23.39							
- - -	Black possibly heavly weather rock MUDSTONE surro brown clay infil.	ounded with		3.00	23.19	-	3.00-3.50	60				
_	Black possibly weather rock MUDSTONE		200	3.30	22.89							
-	Final Depth 3.50m			3.60	22.59							
Gene	eral Remarks									<u> </u>		



Chemistry to deliver results Chemtest Ltd. Depot Road Newmarket CB8 0AL Tel: 01638 606070 Email: info@chemtest.co.uk

Report No :	18-18953-1		
Initial Date of Issue:	20-Jul-2018		
Client	IGSL		
Client Address:	M7 Business Park Naas County Kildare Ireland		
Contact(s):	Darren Keogh		
Project	21068 Waterford Airport (FFA)		
Quotation No.:		Date Received:	29-Jun-2018
Order No.:		Date Instructed:	04-Jul-2018
No. of Samples:	6		
Turnaround (Wkdays):	10	Results Due:	19-Jul-2018
Date Approved:	20-Jul-2018		
Approved By:			
Man			
Details:	Glynn Harvey, Laboratory Manager		

#### Chemtest The right chemistry to deliver results Project: 21068 Waterford Airport (FFA)

# <u>Results - Soil</u>

Client: IGSL	Chemtest Job No.:		18-18953	18-18953	18-18953	18-18953	18-18953	18-18953		
Quotation No.:	(	Chemte	st Sam	ple ID.:	646927	646929	646931	646933	646935	646937
Order No.:		Clie	nt Samp	le Ref.:	1709	1710	1711	1712	1713	1714
	Client Sample ID.:			WS01	WS02	WS03	WS04	WS05	WS06	
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
			Top De	oth (m):	0.50	0.50	0.50	0.50	0.50	0.50
		Bot	tom De	oth (m):	1.50	1.50	1.50	1.50	1.50	1.50
Determinand	Accred.	SOP	Units	LOD						
Moisture	N	2030	%	0.020	12	6.3	8.6	6.8	9.8	10
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.025	< 0.010	< 0.010	0.032	< 0.010	< 0.010
Nitrate (Water Soluble)	N	2220	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	[A] 3.5	[A] 8.9	[A] 1.1	[A] 1.8	[A] 0.99	[A] 0.96
Arsenic	0	2450	mg/kg	1.0	8.8	17	12	12	13	18
Charamium	0	2450	mg/kg	0.10	0.10	0.10	0.10	< 0.10	0.11	0.10
Contornium	0	2450	mg/kg	1.0	14	21	21	19	19	24
Moreuny	0	2450	mg/kg	0.50	29	40	- 0 10	- 0 10	20	< 0.10
Nickel	0	2450	mg/kg	0.10	20	32	20	25	23	20
Lead	U	2450	mg/kg	0.50	20	31	20	19	26	25
Selenium	Ŭ	2450	ma/ka	0.00	< 0.20	< 0.20	< 0.20	< 0.20	0.20	< 0.20
Zinc	Ŭ	2450	ma/ka	0.50	55	59	68	61	65	58
Total Organic Carbon	Ŭ	2625	%	0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20	[A] < 0.20
Total TPH >C6-C40	U	2670	mg/kg	10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10
Naphthalene	U	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Acenaphthylene	U	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Acenaphthene	U	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Fluorene	U	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Phenanthrene	U	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Anthracene	U	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Fluoranthene	U	2700	mg/kg	0.10	[A] < 0.10	[A] 0.13	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Pyrene	U	2700	mg/kg	0.10	[A] < 0.10	[A] 0.41	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Chrysene	U	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Benzolajpyrene	0	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Dibers(1,2,3-C,d)Pyrene	0	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Dibenz(a,n)Anthracene	0	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Tetal Of 16 DAH's	0	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Dichlorodifluoromothano	N	2760	ilig/kg	2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0
Chloromethane		2760	µg/kg	1.0	[A] > 1.0 $[\Delta] < 1.0$	[A] > 1.0 $[\Delta] < 1.0$	[A] > 1.0 $[\Delta] < 1.0$	[A] > 1.0	[A] > 1.0	[A] > 1.0 $[\Delta] < 1.0$
Vinvl Chloride	0	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Bromomethane	<u> </u>	2760	ug/kg	20	[A] < 20	[A] < 20	[A] < 20	[A] < 20	[A] < 20	[A] < 20
Chloroethane	N	2760	ug/kg	20	[A] < 2 0	[A] < 2.0	[A] < 2 0	[A] < 2.0	[A] < 2 0	[A] < 2 0
Trichlorofluoromethane	U	2760	ua/ka	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1.1-Dichloroethene	U	2760	ua/ka	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0

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# <u>Results - Soil</u>

Client: IGSI		Che	mtest J	ob No.:	18-18953	18-18953	18-18953	18-18953	18-18953	18-18953
Quotation No .	Chemtest Sample ID.:		646927	646929	646931	646933	646935	646937		
Order No.:	Client Sample Ref.:			1709	1710	1711	1712	1713	1714	
		Clie	ent Sam	ple ID.:	WS01	WS02	WS03	WS04	WS05	WS06
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
			Top De	oth (m):	0.50	0.50	0.50	0.50	0.50	0.50
		Bot	tom De	oth (m):	1.50	1.50	1.50	1.50	1.50	1.50
Determinand	Accred.	SOP	Units	LOD						
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,1-Dichloroethane	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Bromochloromethane	N	2760	µg/kg	5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0
Trichloromethane	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,1,1-Trichloroethane	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Tetrachloromethane	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,1-Dichloropropene	N	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Benzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,2-Dichloroethane	U	2760	µg/kg	2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0
Irichloroethene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,2-Dichloropropane	0	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Dibromometnane	0	2760	µg/кд	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
biomodichioromethane	U	2760	µg/kg	5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0
Toluono		2760	µg/kg	10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10
Trans-1 3-Dichloropropene	N	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1 1 2-Trichloroethane		2760	ua/ka	10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10
Tetrachloroethene	Ŭ	2760	ua/ka	10	[A] < 1.0					
1.3-Dichloropropane	N	2760	ua/ka	2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0
Dibromochloromethane	N	2760	ua/ka	10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10
1,2-Dibromoethane	U	2760	µg/kg	5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0	[A] < 5.0
Chlorobenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0
Ethylbenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Styrene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Tribromomethane	N	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Isopropylbenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Bromobenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50	[A] < 50	[A] < 50	[A] < 50	[A] < 50	[A] < 50	[A] < 50
N-Propylbenzene	N	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,3,5-1 rimethylbenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
4-Chiorololuene	N	2760	µg/кд	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
	IN II	2760	µg/kg	1.0	$[A] \le 1.0$	$[A] \le 1.0$	$[A] \le 1.0$	$[A] \le 1.0$	$[A] \le 1.0$	$[A] \le 1.0$
Soc Rutulbonzono	U N	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Geo-DuryiDeliZelle	IN	2100	µу/кg	1.0	[A] \ 1.0	[A] > 1.0	[A] > 1.0	[A] \ 1.0		[A] > 1.0

Page 3 of 7



# Results - Soil

Client: IGSL		Che	mtest Jo	ob No.:	18-18953	18-18953	18-18953	18-18953	18-18953	18-18953
Quotation No.:	0	Chemte	st Sam	ple ID.:	646927	646929	646931	646933	646935	646937
Order No.:		Clie	nt Samp	le Ref.:	1709	1710	1711	1712	1713	1714
		Clie	ent Sam	ple ID.:	WS01	WS02	WS03	WS04	WS05	WS06
			Sampl	e Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top De	oth (m):	0.50	0.50	0.50	0.50	0.50	0.50
		Bot	tom De	oth (m):	1.50	1.50	1.50	1.50	1.50	1.50
Determinand	Accred.	SOP	Units	LOD						
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
4-Isopropyltoluene	N	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
N-Butylbenzene	N	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,2-Dibromo-3-Chloropropane	N	2760	µg/kg	50	[A] < 50	[A] < 50	[A] < 50	[A] < 50	[A] < 50	[A] < 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Hexachlorobutadiene	N	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
1,2,3-Trichlorobenzene	N	2760	µg/kg	2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0
Methyl Tert-Butyl Ether	Ū	2760	µg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0
Ethylene Glycol	Ň	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Page 4 of 7



# **Deviations**

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample ID:	Sample Ref:	Sample ID:	Sampled Date:	Deviation Code(s):	Containers Received:
646927	1709	WS01		А	Amber Glass 250ml
646927	1709	WS01		А	Amber Glass 60ml
646929	1710	WS02		А	Amber Glass 250ml
646929	1710	WS02		А	Amber Glass 60ml
646931	1711	WS03		А	Amber Glass 250ml
646931	1711	WS03		А	Amber Glass 60ml
646933	1712	WS04		А	Amber Glass 250ml
646933	1712	WS04		А	Amber Glass 60ml
646935	1713	WS05		А	Amber Glass 250ml
646935	1713	WS05		А	Amber Glass 60ml
646937	1714	WS06		А	Amber Glass 250ml
646937	1714	WS06		A	Amber Glass 60ml



# Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3- band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	Glycols, Aldehydes, Amines, Ethers and Ketones	Glycols, Aldehydes, Amines, Ethers and Ketones	GCMS detection



### Report Information

#### Key

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- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation The results relate only to the items tested Uncertainty of measurement for the determinands tested are available upon request None of the results in this report have been recovery corrected All results are expressed on a dry weight basis The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols For all other tests the samples were dried at < 37°C prior to analysis All Asbestos testing is performed at the indicated laboratory Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

#### Sample Deviation Codes

- A Date of sampling not supplied
- B Sample age exceeds stability time (sampling to extraction)
- C Sample not received in appropriate containers
- D Broken Container
- E Insufficient Sample (Applies to LOI in Trommel Fines Only)

#### Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt All water samples will be retained for 14 days from the date of receipt Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to: <u>customerservices@chemtest.co.uk</u>



Report No.:	18-21066-1		
Initial Date of Issue:	25-Jul-2018		
Client	IGSL		
Client Address:	M7 Business Park Naas County Kildare Ireland		
Contact(s):	Darren Keogh		
Project	21068 Waterford Airport (FFA)		
Quotation No.:		Date Received:	23-Jul-2018
Order No.:		Date Instructed:	23-Jul-2018
No. of Samples:	6		
Turnaround (Wkdays):	3	Results Due:	25-Jul-2018
Date Approved:	25-Jul-2018		
Approved By:			
M.J.			
Details:	Martin Dyer, Laboratory Manager		

#### Chemtest The right chemistry to deliver results Project: 21068 Waterford Airport (FFA)

# Results - Water

							40.04000	40.04000	40.04000	40.04000
Client: IGSL			terntest Jo	ID	18-21066	18-21066	18-21066	18-21066	18-21066	18-21066
Quotation No.:	Chemitest Sample ID			646939	646940	646941	658354	658355	658356	
Order No.:	Client Sample Rel.			14/07	14/00	14/00		51164	DUIDO	
	Client Sample ID.:			WS1	WS3	WS6	WS4	BH01	BH02	
			Sampi	e Type:	WATER	WATER	WATER	WATER	WATER	WATER
			Date Sa	ampled:						
Determinand	Accred.	SOP	Units	LOD						
pH	U	1010		N/A	[A] 8.1	[A] 7.7	[A] 7.5	[A] 7.6	[A] 8.0	[A] 7.7
Electrical Conductivity	U	1020	µS/cm	1.0	[A] 650	[A] 650	[A] 910	[A] 590	[A] 650	[A] 670
Biochemical Oxygen Demand	N	1090	mg O2/I	4.0	[A] 8.2	[A] 11	[A] 8.1	[A] 6.8	[A] 13	[A] 12
Chemical Oxygen Demand	U	1100	mg O2/I	10	[A] 26	[A] 39	[A] 26	[A] 23	[A] 40	[A] 50
Alkalinity (Total)	U	1220	mg/l	10	[A] 320	[A] 300	[A] 410	[A] 250	[A] 330	[A] 320
Chloride	U	1220	mg/l	1.0	[A] 35	[A] 43	[A] 54	[A] 43	[A] 43	[A] 39
Ammonia (Free)	U	1220	mg/l	0.050	[A] < 0.050	[A] < 0.050	[A] < 0.050	[A] < 0.050	[A] 0.11	[A] < 0.050
Orthophosphate as PO4	U	1220	mg/l	0.050	[A] < 0.050	[A] < 0.050	[A] < 0.050	[A] < 0.050	[A] < 0.050	[A] < 0.050
Sulphate	U	1220	mg/l	1.0	[A] 44	[A] 33	[A] 100	[A] 54	[A] < 1.0	[A] 12
Total Oxidised Nitrogen	U	1220	mg/l	0.20	0.93	< 0.20	0.47	1.2	< 0.20	< 0.20
Arsenic (Dissolved)	U	1450	µg/l	1.0	[A] < 1.0	[A] 2.3	[A] 1.0	[A] 1.8	[A] 5.1	[A] 7.3
Cadmium (Dissolved)	U	1450	µg/l	0.080	[A] < 0.080	[A] < 0.080	[A] < 0.080	[A] < 0.080	[A] < 0.080	[A] < 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] 4.0	[A] 5.5	[A] 2.3
Copper (Dissolved)	U	1450	µg/l	1.0	[A] 1.2	[A] 1.1	[A] 1.1	[A] 1.4	[A] 9.7	[A] 8.1
Mercury (Dissolved)	U	1450	µg/l	0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50
Nickel (Dissolved)	U	1450	µg/l	1.0	[A] 2.6	[A] 3.1	[A] < 1.0	[A] < 1.0	[A] 3.5	[A] 6.3
Lead (Dissolved)	U	1450	µg/l	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0	[A] 2.8	[A] 1.6
Selenium (Dissolved)	U	1450	µg/l	1.0	[A] 3.2	[A] 2.2	[A] 2.0	[A] 1.7	[A] 1.8	[A] 2.3
Zinc (Dissolved)	U	1450	µg/l	1.0	[A] 8.2	[A] 3.2	[A] 2.3	[A] 1.7	[A] 16	[A] 9.9
Total Organic Carbon	U	1610	mg/l	2.0	4.9	5.9	5.1	4.1	19	17
Total TPH >C6-C40	U	1670	µg/l	10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10	[A] < 10
Naphthalene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Acenaphthylene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Acenaphthene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Fluorene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Phenanthrene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Anthracene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Fluoranthene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Pyrene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Benzo[a]anthracene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Chrysene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Benzo[A]fluoranthene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Benzo[k]fluoranthene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Benzo[a]pyrene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Total Of 16 PAH's	U	1700	µg/l	2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0	[A] < 2.0
Ethylene Glycol	Ν	1780	mg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Page 2 of 5



# **Deviations**

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample ID:	Sample Ref:	Sample ID:	Sampled Date:	Deviation Code(s):	Containers Received:
646939	WS1			A	Coloured Winchester 1000ml
646939	WS1			А	EPA Vial 40ml
646940	WS3			А	Coloured Winchester 1000ml
646940	WS3			А	EPA Vial 40ml
646941	WS6			А	Coloured Winchester 1000ml
646941	WS6			А	EPA Vial 40ml
658354	WS4			А	Coloured Winchester 1000ml
658354	WS4			А	EPA Vial 40ml
658355	BH01			А	Coloured Winchester 1000ml
658355	BH01			А	EPA Vial 40ml
658356	BH02			A	Coloured Winchester 1000ml
658356	BH02			A	EPA Vial 40ml



# Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pН	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1090	Biochemical Oxygen Demand	Biochemical Oxygen demand (BOD)	Electrometric determination of dissolved oxygen in seeded sample initially and after 5 days incubation at 20°C.
1100	Chemical Oxygen Demand	Chemical Oxygen demand (COD)	Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI].
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3- band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GC FID detection
1780	Alcohols	Alcohols	GCMS detection



#### Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation The results relate only to the items tested Uncertainty of measurement for the determinands tested are available upon request None of the results in this report have been recovery corrected All results are expressed on a dry weight basis The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols For all other tests the samples were dried at < 37°C prior to analysis All Asbestos testing is performed at the indicated laboratory Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

#### Sample Deviation Codes

- A Date of sampling not supplied
- B Sample age exceeds stability time (sampling to extraction)
- C Sample not received in appropriate containers
- D Broken Container
- E Insufficient Sample (Applies to LOI in Trommel Fines Only)

#### Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt All water samples will be retained for 14 days from the date of receipt Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to: <u>customerservices@chemtest.co.uk</u>


# **APPENDIX 9-1**

Photomontages





	Description	App By Date					PROJECT	
	PHOTOMONTAGE FROM VP LOCATION	SG 29.06.18			DNSULTANTS II IVIRONMENTA	N ENGINEERING & L SCIENCES		WATERFORD AIRPORT EXTENSIO
			FEHI TIMON	Core Poula EY Cork,	House, duff Rd, Ireland.	J5 Plaza, North Park Business Park, North Road, Dublin 11, Ireland		
			& COMPA T:+353-21-496	<b>NY</b> 4133, F:+353-21	-4964464 T:+353-1-6583500, F:+353-	1-6583501 W: www.fehilytimoney.ie, E: info@ftco.ie		
-			CODE	STATUS	SUITABILITY DESCRIPTION	PURPOSE OF ISSUE		

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CLIENT WATERFORD AIRPORT PLC Project number P1694 Scale (@ A1- ) N/A Date 29.06.18 Drawing Number Drawn by Rev SOC P1694-PM-01 Α Checked by SG O:\ACAD\2018\P1694\P1694-PM-0001



tal<sup>C</sup>VP3 CNES (2018) Distribution Airbus DS

		If Applicable : Ordnance Survey Ireland Licence No. EN 00012	218 © Ordn	ance Survey Irela	nd and Govern	nment of Ireland								
Rev	7. Description		Арр Ву	Date					PROJECT		CLIENT			
Α	PHOTOMONTAGE FROM VP LOCAT	ON	SG	29.06.18			ONSULTANTS IN NVIRONMENTAL	N ENGINEERING &		WATERFORD AIRPORT EXTENSION	۱		RT PLC	
					FEI	HILY ONEY Core	e House, aduff Rd, <, Ireland.	J5 Plaza, North Park Business Park, North Road, Dublin 11, Ireland						
			_		& CO	<b>MPANY</b>	1-4964464 T:+353-1-6583500 F:+353-1-	-6583501 W: www.febilytimonev.ie. F: info@ftco.ie	SHEET		Date 29.06.18	Project number P1694	Scale (@ A1- ) N/A	
$\vdash$					CODE	STATUS	SUITABILITY DESCRIPTION	PURPOSE OF ISSUE	-	VIEW POINT 2	Drawn by SOC Checked by SG	P1694-PM-02	R	Rev A
No p	I part of this document may be reproduced	or transmitted in any form or stored in any retrieval system of any	y nature wit	hout the written	L permission of F	ehily Timoney & C	Company as copyright holder except as	agreed for use on the project for which the docun	l nent was origina	Ily issued. Do not scale. Use figured dimensions only. If in doubt - Ask!	O:\ACAD\2018\P1694\P1694-PM-0002			

VP Co-ordinates: E663061, N605329 Camera Height: 1.6m Focal Length: 50mm Bearing Angle: 205° Elevation: 37m



Rev. Description	App By Dat	e					PROJECT		CLIENT		
A PHOTOMONTAGE FROM VP LOCATION	SG 29.	06.18	FEHIL	CC EN Core Poulac	DNSULTANTS IN VIRONMENTAL House, duff Rd, Isoland	J ENGINEERING & SCIENCES J5 Plaza, North Park Business Park, North Road, Dublia 11 Justand		WATERFORD AIRPORT EXTENSION		WATERFORD AIRPO	<b>)RT PLC</b>
			& COMPAN	Y			SHEET		Date 29.06.1	Project number 18 P1694	Scale (@ A1- ) N/A
			T:+353-21-49641	33, F:+353-21-	4964464 T:+353-1-6583500, F:+353-1-	6583501 W: www.fehilytimoney.ie, E: info@ftco.ie			Drawn by	Drawing Number	Rev
			CODE	STATUS	SUITABILITY DESCRIPTION	PURPOSE OF ISSUE			SOC Checked by SG	P1694-PM-03	F

view From Local Road Local Road L4068 Towards The Northwes
VP Co-ordinates: E663443, N600719
Camera Height: 1.6m
Focal Length: 50mm
Bearing Angle: 346°
Elevation: 42m



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July



## APPENDIX 10-1

Description of the AERMOD Model



## **APPENDIX 10.1**

#### **Description of the AERMOD Model**

The AERMOD dispersion model has been recently developed, in part, by the U.S. Environmental Protection Agency (USEPA, 2019a). The model is a steady-state Gaussian model used to assess pollutant concentrations associated with industrial sources. The model is an enhancement on the Industrial Source Complex-Short Term 3 (ISCST3) model which has been widely used for emissions from industrial sources. The 2005 Guidelines on Air Quality Models has promulgated AERMOD as the preferred model for a refined analysis from industrial sources, in all terrains.

Improvements over the ISCST3 model include the treatment of the vertical distribution of concentration within the plume. ISCST3 assumes a Gaussian distribution in both the horizontal and vertical direction under all weather conditions. AERMOD, however, treats the vertical distribution as non-Gaussian under convective (unstable) conditions while maintaining a Gaussian distribution in both the horizontal and vertical direction during stable conditions. This treatment reflects the fact that the plume is skewed upwards under convective conditions due to the greater intensity of turbulence above the plume than below. The result is a more accurate portrayal of actual conditions using the AERMOD model. AERMOD also enhances the turbulence of night-time urban boundary layers thus simulating the influence of the urban heat island.

In contrast to ISCST3, AERMOD is widely applicable in all types of terrain. Differentiation of the simple versus complex terrain is unnecessary with AERMOD. In complex terrain, AERMOD employs the dividing-streamline concept in a simplified simulation of the effects of plume-terrain interactions. In the dividing-streamline concept, flow below this height remains horizontal, and flow above this height tends to rise up and over terrain. Extensive validation studies have found that AERMOD performs better than ISCST3 for many applications and as well or better than CTDMPLUS for several complex terrain data sets (USEPA, 1999).

AERMOD has made substantial improvements in the area of plume growth rates in comparison to ISCST3 (USEPA 2019a). ISCST3 approximates turbulence using six Pasquill-Gifford-Turner Stability Classes and bases the resulting dispersion curves upon surface release experiments. This treatment, however, cannot explicitly account for turbulence in the formulation. AERMOD is based on the more realistic modern planetary boundary layer (PBL) theory which allows turbulence to vary with height. This use of turbulence-based plume growth with height leads to a substantial advancement over the ISCST3 treatment.

Improvements have also been made in relation to mixing height (USEPA 201ua). The treatment of mixing height by ISCST3 is based on a single morning upper air sounding each day. AERMOD, however, calculates mixing height on an hourly basis based on the morning upper air sounding and the surface energy balance, accounting for the solar radiation, cloud cover, reflectivity of the ground and the latent heat due to evaporation from the ground cover. This more advanced formulation provides a more realistic sequence of the diurnal mixing height changes.

AERMOD also contains improved algorithms for dealing with low wind speed (near calm) conditions. As a result, AERMOD can produce model estimates for conditions when the wind speed may be less than 1 m/s, but still greater than the instrument threshold.

AERMOD incorporates a meteorological pre-processor AERMET. AERMET allows AERMOD to account for changes in the plume behaviour with height. AERMET calculates hourly boundary layer parameters for use by AERMOD, including friction velocity, Monin-Obukhov length, convective velocity scale, convective (CBL) and stable boundary layer (SBL) height and surface heat flux. AERMOD uses this information to calculate concentrations in a manner that accounts for changes in dispersion rate with height, allows for a non-Gaussian plume in convective conditions, and accounts for a dispersion rate that is a continuous function of meteorology.

The AERMET meteorological preprocessor requires the input of surface characteristics, including surface roughness (z0), Bowen Ratio and albedo by sector and season, as well as hourly observations of wind speed, wind direction, cloud cover, and temperature. A morning sounding from a representative upper air station, latitude, longitude, time zone, and wind speed threshold are also required.

Two files are produced by AERMET for input to the AERMOD dispersion model. The surface file contains observed and calculated surface variables, one record per hour. The profile file contains the observations made at each level of a meteorological tower, if available, or the one-level observations taken from other representative data, one record level per hour.

From the surface characteristics (i.e. surface roughness, albedo and amount of moisture available (Bowen Ratio)) AERMET calculates several boundary layer parameters that are important in the evolution of the boundary layer, which, in turn, influences the dispersion of pollutants. These parameters include the surface friction velocity, which is a measure of the vertical transport of horizontal momentum; the sensible heat flux, which is the vertical transport of heat to/from the surface; the Monin-Obukhov length which is a stability parameter relating the surface friction velocity to the sensible heat flux; the daytime mixed layer height; the nocturnal surface layer height and the convective velocity scale which combines the daytime mixed layer height and the sensible heat flux. These parameters all depend on the underlying surface.



# **APPENDIX 10-2**

Dust Management Plan



## **APPENDIX 10.2**

#### **Dust Minimisation Plan**

A dust minimisation plan will be formulated for the construction phase of the project, as construction activities are likely to generate some dust emissions. The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of any dust produced will be deposited close to the potential source and any impacts from dust deposition will typically be within two hundred metres of the construction area.

In order to ensure mitigation of the effects of dust nuisance, a series of measures will be implemented. Site roads shall be regularly cleaned and maintained as appropriate, dry sweeping of large areas should be avoided. Hard surface roads shall be swept to remove mud and aggregate materials from their surface while any un-surfaced roads shall be restricted to essential site traffic only. Furthermore, any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.

Vehicles using site roads shall have their speeds restricted where there is a potential for dust generation. Vehicles delivering material with dust potential to an off-site location shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust. Access gates to be located at least 10m from receptors where possible.

Public roads outside the site shall be regularly inspected for cleanliness and cleaned as necessary. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. Record should be kept of all inspections of the haul routes and any subsequent action in a site log book.

Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind. Sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods, activities such as scabbling should be avoided. Bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.

The internal building works will be designed and arranged to limit the dust emissions in order to protect the existing ongoing operations from their effects. In the event of internal dust emissions being generated by the proposed works additional mitigations will put into place, for example sheeting off the internal works from the existing operation, fine water misting or localised air filtration.

At all times, the procedures put in place will be strictly monitored and assessed by the contractor. In the event of dust nuisance occurring outside the site boundary, satisfactory procedures will be implemented to rectify the problem. Dust monitoring should be put in place to ensure dust mitigation measures are controlling emissions. Dust monitoring should be conducted using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m<sup>2</sup>\*day) during the monitoring period between 28-32 days.

The Dust Minimisation Plan shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. The name and contact details of a person to contact regarding air quality and dust issues should be displayed on the site boundary, this notice board should also include head/regional office contact details. Community engagement before works commence on site should be put in place, including a communications plan. All dust and air quality complaints should be recorded and causes identified, along with the measures taken to reduce emissions. This complaints log should be available for viewing by the local authority, if requested. Daily on and off site inspections should occur for nuisance dust and compliance with the dust management plan. This should include regular dust soiling checks of surfaces such as street furniture, windows, and cars within 100m of the site boundary. Cleaning should be provided if necessary.



## **APPENDIX 11-1**

**Receptor Locations** 



Receptor ID	Description	Easting	Northing
R1	Residential	662511	602915
R2	Residential	662208	603004
R3	Residential	662751	606103
R4	Residential	662806	603101
R5	Residential	661771	603240
R6	Residential	663159	605109
R7	Residential	662869	606325
R8	Residential	661872	603368
	Residential/		
R9	Commercial	663135	605046
	Residential/		
R10	Commercial	661396	603202
	Residential/		
R11	Commercial	662256	606210
R15	Residential	662744	606086
R143	Residential	662526	606309
R144	Residential	661940	605842
R145	Residential	663164	605143
R298	Residential	663077	605236
R299	Residential	662739	606031
R300	Residential	662771	605916
R301	Residential	661777	603310
R302	Residential	663155	604877
R303	Residential	662895	605640
R304	Residential	662861	605685
R305	Residential	663079	605103
R306	Residential	663142	605021
R307	Residential	663110	605289
R308	Residential	662749	603069
R309	Residential	662157	604440
	Residential/		
R310	Commercial	662012	603153
R311	Residential	661715	603366
R312	Residential	662183	603158
R313	Residential	662184	603082
	Residential/		
R314	Commercial	662213	603081
R315	Residential	662816	605788
R316	Residential	662562	606094
R317	Residential	662620	606374
R318	Residential	662771	605858
R319	Residential	662581	606410
R326	Residential	662489	606268

Receptor ID	Description	Easting	Northing
R327	Residential	662397	606223
R328	Residential	663282	607885
R329	Residential	663277	607859
R330	Residential	662347	606833
R331	Residential	663239	607569
R332	Residential	663128	607472
R333	Residential	663198	607414
R334	Residential	663043	607491
R335	Residential	662643	606472
R336	Residential	662213	606629
R337	Residential	662903	607096
R338	Residential	663079	607522
R339	Residential	663032	607153
R340	Residential	663154	607502
R341	Residential	663176	607521
R342	Residential	663386	607893
R343	Residential	663346	607874
R344	Residential	663000	607191
R345	Residential	663149	607590
R346	Residential	663235	607609
R347	Residential	663316	607861
	Residential/		
R348	Commercial	664037	606175
	Residential/		
R349	Commercial	664004	606338
R351	Residential	664041	606127
R352	Residential	663974	606415
R353	Residential	663982	606316
R354	Residential	663980	606372
R355	Residential	663864	609291
R356	Residential	663435	608403
R359	Residential	663801	608297
R360	Residential	663783	608275
R361	Residential	663770	609016
R362	Residential	663694	609026
R363	Residential	664142	609817
R364	Residential	664125	609824
R365	Residential	664128	609791
R366	Residential	664117	609780
R367	Residential	664097	609761
R368	Residential	664080	609741
R369	Residential	664068	609725
R370	Residential	664053	609716

Receptor ID	Description	Easting	Northing
R371	Residential	664041	609705
R372	Residential	664032	609695
R373	Residential	664078	609773
R374	Residential	664097	609800
R375	Residential	664010	609662
R376	Residential	664019	609653
R377	Residential	664025	609650
R378	Residential	664226	609751
R379	Residential	664244	609733
R380	Residential	664266	609717
R381	Residential	664288	609713
R382	Residential	664310	609712
R383	Residential	664320	609665
R384	Residential	664295	609663
R385	Residential	664270	609662
R386	Residential	664244	609668
R387	Residential	664275	609587
R388	Residential	664320	609586
R389	Residential	664081	609474
R390	Residential	664066	609448
R400	Residential	664043	609305
R401	Residential	664035	609308
R402	Residential	664029	609306
R403	Residential	664023	609310
R404	Residential	664015	609312
R405	Residential	664006	609310
R406	Residential	663999	609312
R407	Residential	663993	609272
R408	Residential	664001	609272
R409	Residential	664008	609273
R410	Residential	664020	609274
R411	Residential	664026	609271
R412	Residential	664032	609274
R413	Residential	664039	609272
R415	Residential	664027	609200
R416	Residential	664036	609192
R417	Residential	664035	609167
R418	Residential	664042	609161
R419	Residential	664041	609129
R420	Residential	664051	609123
R421	Residential	664046	609101
R422	Residential	664056	609094

Receptor ID	Description	Easting	Northing
R423	Residential	664095	609158
R424	Residential	664114	609083
R426	Residential	663974	609088
R428	Residential	664270	609810
R429	Residential	664289	609794
R430	Residential	664483	609722
	Residential/		
R431	Commercial	664532	609699
R432	Residential	664511	609607
R433	Residential	664636	609626
	Residential/		
R434	Commercial	664681	609602
R435	Residential	664723	609709
R436	Residential	664679	609307
	Residential/		
R437	Commercial	664648	609293
R438	Residential	664339	608678
R439	Residential	664379	608610
R440	Residential	664414	608568
	Residential/		
R441	Commercial	663902	609311
R442	Residential	663793	609318
R443	Residential	663817	609311
R444	Residential	663839	609302
R445	Residential	663842	609248
R446	Residential	663823	609258
R447	Residential	663798	609268
R448	Residential	663774	609283
R449	Residential	663728	609213
R450	Residential	663754	609201
R451	Residential	663779	609187
R452	Residential	663801	609175
R453	Residential	663830	609217
R454	Residential	663796	609230
R455	Residential	663776	609240
R456	Residential	663760	609249
R457	Residential	664105	609129
R458	Residential	663808	608347
R459	Residential	663872	608586
R460	Residential	663929	609307
R462	Residential	663879	609321
R463	Residential	663567	607388
R464	Residential	664432	609612

<b>Receptor ID</b>	Description	Easting	Northing
R465	Residential	664363	609558
R466	Residential	663958	609369
R467	Residential	663961	609290
R468	Residential	663842	609337
R469	Residential	663856	609379
R470	Residential	663872	609366
R471	Residential	663897	609355
R472	Residential	663915	609381
R473	Residential	663938	609423
R474	Residential	663864	609434
R475	Residential	663856	609413
R476	Residential	663813	609351
R477	Residential	663947	609344
R478	Residential	663836	609389
R479	Residential	664395	609676
R480	Residential	663926	609402
R481	Residential	663910	609444
R482	Residential	663889	609455
	Residential/		
R483	Commercial	664660	609690
R484	Residential	663976	609314
R485	Residential	663902	609064
R486	Residential	663889	609027
R487	Residential	663839	609037
R488	Residential	663849	609076
R489	Residential	663867	606718
R490	Residential	663831	606904
R491	Residential	663943	609054
R492	Residential	663942	609049
R493	Residential	663942	609040
R494	Residential	663943	609036
R495	Residential	663946	609030
	Residential/		
R496	Commercial	663950	609025
R497	Residential	663955	609021
R498	Residential	663959	609018
R499	Residential	663964	609016
R500	Residential	663969	609014
R501	Residential	663973	609013
R502	Residential	663979	609010
R503	Residential	663984	609008
R504	Residential	663989	609006
R505	Residential	663999	609004

Receptor ID	Description	Easting	Northing
R506	Residential	663995	608993
R507	Residential	663992	608985
R508	Residential	663988	608979
R509	Residential	663985	608974
R510	Residential	663983	608969
R511	Residential	663980	608960
R512	Residential	663971	608979
R513	Residential	663967	608981
R514	Residential	663961	608983
R515	Residential	663957	608984
R516	Residential	663951	608987
R517	Residential	663947	608989
R518	Residential	663942	608990
R519	Residential	663935	608994
R520	Residential	663927	608998
R521	Residential	663919	608995
R522	Residential	663914	608989
R523	Residential	663911	608984
R524	Residential	663907	608978
R525	Residential	663902	608972
R526	Residential	663898	608965
R527	Residential	663903	608956
R528	Residential	663910	608954
R529	Residential	663916	608951
R530	Residential	663920	608948
R531	Residential	663925	608945
R532	Residential	663929	608941
R533	Residential	663934	608938
R534	Residential	663938	608935
R535	Residential	663962	608931
R536	Residential	663951	608930
R537	Residential	663947	608923
R538	Residential	663942	608918
R539	Residential	663939	608914
R540	Residential	663937	608910
R541	Residential	663932	608905
R543	Residential	663920	608911
R544	Residential	663916	608915
R545	Residential	663911	608919
R546	Residential	663906	608922
R547	Residential	663902	608924
R548	Residential	663898	608928

<b>Receptor ID</b>	Description	Easting	Northing
R549	Residential	663893	608933
R550	Residential	663886	608937
R551	Residential	663879	608936
R552	Residential	663872	608926
R553	Residential	663870	608920
R554	Residential	663867	608916
R555	Residential	663861	608911
R556	Residential	663856	608905
R557	Residential	663854	608895
R558	Residential	663861	608891
R559	Residential	663867	608886
R560	Residential	663872	608883
R561	Residential	663876	608881
R562	Residential	663879	608876
R563	Residential	663884	608873
R564	Residential	663907	608855
R566	Residential	663888	608868
R567	Residential	663913	608842
R569	Residential	663940	608847
R571	Residential	663960	608830
R572	Residential	663948	608825
R573	Residential	663940	608831
R574	Residential	663964	608818
R575	Residential	663957	608813
R576	Residential	663952	608807
R577	Residential	663947	608799
R578	Residential	663946	608787
R579	Residential	663953	608782
R580	Residential	663959	608779
R581	Residential	664025	608891
R582	Residential	664017	608885
R583	Residential	664007	608877
R584	Residential	664002	608871
R585	Residential	663996	608864
R586	Residential	663992	608856
R587	Residential	663980	608852
R588	Residential	663981	608869
R589	Residential	663974	608873
R590	Residential	663958	608868
R592	Residential	663971	608888
R593	Residential	663975	608894
R594	Residential	663988	608913

Receptor ID	Description	Easting	Northing
R596	Residential	663992	608894
R597	Residential	664010	608898
R598	Residential	663958	609121
	Residential/		
R599	Commercial	663949	608606
R603	Residential	663957	608681
R604	Residential	663963	608678
R605	Residential	663976	608670
R606	Residential	663974	608665
R607	Residential	663972	608658
R608	Residential	663968	608652
R609	Residential	663995	608662
R610	Residential	663991	608649
R611	Residential	663988	608644
R612	Residential	663994	608655
R613	Residential	664181	607866
	Residential/		
R614	Commercial	663599	607482
R615	Residential	663680	608908
R616	Residential	663785	609114
R617	Residential	664034	608918
R618	Residential	663999	608759
R619	Residential	664397	609639
R620	Residential	664002	609201
R622	Residential	664324	608881
R623	Residential	664452	608886
R624	Residential	664409	608206
R625	Residential	663816	609225
R626	Residential	663681	608168
R627	Residential	663869	606645
R629	Residential	663988	608896
R630	Residential	663963	608876
R632	Residential	663934	608839
R634	Residential	663920	608837
R636	Residential	663914	608866
R638	Residential	663895	608863
R640	Residential	663931	608888
R642	Residential	663939	608900
R644	Residential	664473	608386
R645	Residential	664001	608890
R646	Residential	663983	608900
R649	Residential	664429	609672
R650	Residential	664054	608930

<b>Receptor ID</b>	Description	Easting	Northing
R651	Residential	663992	609120
R652	Residential	664401	609578
R653	Residential	663686	609142
R654	Residential	663714	609111
R655	Residential	663756	609090
R656	Residential	663846	606867
R657	Residential	663878	606941
R658	Residential	664152	607860
R659	Residential	664403	608244
R660	Residential	664395	608308
R661	Residential	664497	608247
R662	Residential	664393	608333
R663	Residential	664395	608529
R664	Residential	664479	608528
R665	Residential	664379	608499
R666	Residential	664439	608564
R667	Residential	663955	608709
R668	Residential	663979	608702
R669	Residential	664330	608705
R670	Residential	664359	608632
R671	Residential	664406	608594
R672	Residential	663614	608067
	Residential/		
R673	Commercial	663874	607005
R674	Residential	664458	607958
R675	Residential	664197	607874
R676	Residential	663884	607028
R677	Residential	664457	608001
R678	Residential	664173	607863
R679	Residential	664400	608272
R680	Residential	664470	608334
R681	Residential	664444	608569
R682	Residential	663986	608757
R683	Residential	664351	608661
	Residential/		
R684	Commercial	664241	607878
R685	Residential	664658	609125
R686	Residential	663908	609501
R687	Residential	663911	609505
R688	Residential	663920	609511
R689	Residential	663923	609515
R690	Residential	663926	609523
R691	Residential	663929	609528

Receptor ID	Description	Easting	Northing
R692	Residential	663940	609549
R693	Residential	663945	609552
R694	Residential	663949	609560
R695	Residential	663952	609563
R696	Residential	663954	609567
R697	Residential	663957	609570
R698	Residential	663964	609584
R699	Residential	663962	609589
R700	Residential	663830	608964
R701	Residential	663972	609400
R702	Residential	663854	608948
R703	Residential	664436	609429
R715	Residential	663195	604433
R716	Residential	663197	604395
	Residential/		
R717	Commercial	663196	604284
R718	Residential	663268	603880
R719	Residential	663236	603644
R720	Residential	663303	603592
R721	Residential	663266	603543
R722	Residential	663315	603534
R723	Residential	663283	603517
R724	Residential	663349	603512
R725	Residential	663286	603480
	Residential/		
R726	Commercial	664016	604375
0707	Residential/	664042	604254
R/2/	Commercial Recidential/	664012	604354
<b>P</b> 728	Commercial	661051	603779
R729	Residential	661308	604145
R720	Residential	661242	604230
R731	Residential	661242	604230
10.21	Residential/	001245	004332
R732	Commercial	661657	604589
_	Residential/		
R733	Commercial	661325	604912
	Residential/		
R734	Commercial	661532	604825
R735	Residential	661566	604856
R736	Residential	661664	604877
R737	Residential	661619	604937
R738	Residential	661643	604956

<b>Receptor ID</b>	Description	Easting	Northing
R739	Residential	663122	602810
	Residential/		
R740	Commercial	663298	603364



# APPENDIX 11.2

**Calibration Certificates** 







PTB1.63-4046158

Page 1 of 10

No: CDK1609408

No: 2737145

No: 2460008

No: 6822

Pattern Approval:

No: 2654662 Id: - 2654662

## CERTIFICATE OF CALIBRATION

#### CALIBRATION OF

Sound Level Meter: Microphone: Preamplifier: Supplied Calibrator: Brüel & Kjær Type 2250 Brüel & Kjær Type 4950 Brüel & Kjær Type ZC-0032 Brüel & Kjær Type 4231 BZ7222 Version 2.1

Software version: Instruction manual: BZ7222 Version 2.1 BE1712-18

CUSTOMER

Enfonic Ltd Tecpro House IDA Business & Technology Park Dublin D17 NX50 Ireland

### CALIBRATION CONDITIONS

Preconditioning: 4 hours at  $23^{\circ}C \pm 3^{\circ}C$ 

Environment conditions: See actual values in Environmental conditions sections.

### SPECIFICATIONS

The Sound Level Meter Brüel & Kjær Type 2250 has been calibrated in accordance with the requirements as specified in IEC61672-1:2002 class 1. Procedures from IEC 61672-3:2006 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

### PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 4.9 - DB: 4.90) by using procedure 2250-4189.

#### RESULTS

Calibration Mode: Calibration as received.

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor k = 2 providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2017-02-13

Date of issue: 2017-02-13

onder

Mikail Önder Calibration Technician

Susanne Jørgensen Approved Signatory

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## CERTIFICATE OF CALIBRATION

### CALIBRATION OF

CAL Reg nr. 307

### No: CDK1698997

Page 1 of 10

CALIDIATION OF			
Sound Level Meter:	Brüel & Kjær Type 2250	No: 3001350	Id: - 3001350
Microphone:	Brüel & Kjær Type 4950	No: 2778447	
Preamplifier:	Brüel & Kjær Type ZC-0032	No: 16741	
Supplied Calibrator:	Brüel & Kjær Type 4231	No: 2615338	
Software version:	BZ7222 Version 2.1	Pattern Approval:	PTB1.63-4046158
Instruction manual:	BE1712-18		

### CUSTOMER

Enfonic Ltd Tecpro House Dublin D17 NX50 Ireland

### CALIBRATION CONDITIONS

Preconditioning:4 hours at  $23^{\circ}C \pm 3^{\circ}C$ Environment conditions:See actual values in Environmental conditions sections.

### SPECIFICATIONS

The Sound Level Meter Brüel & Kjær Type 2250 has been calibrated in accordance with the requirements as specified in IEC61672-1:2002 class 1. Procedures from IEC 61672-3:2006 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

## PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 4.9 - DB: 4.90) by using procedure 2250-4189.

## RESULTS

#### Calibration Mode: Calibration as received.

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor k = 2 providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2017-07-19

Mikail Önder

Calibration Technician

wante

Date of issue: 2017-07-19

Susanne Jørgensen Approved Signatory

Reproduction of the complete certificate is allowed. Parts of the certificate may only be reproduced after written permission.

Certificate of Calibration Issued by University of Salford (Acoustics Calibration Laboratory) UKAS ACCREDITED CALIBRATION LABORATORY NO. 0801	
Page 1 of 3	
APPROVED SIGNATORIES	
Gary Phillips [] Danny McCaul []	
	University of
acoustic calibration laboratory	Salford
295 3030/0161 295 3319 f 0161 295 4456 e c.lomax1@salford.ac.uk The University of Salford, Salford, Greater Manchester, M5 4WT, UK t 0161 http://www.acoustics.salford.ac.uk	MANCHESTER

Certificate Number: 03360/1 Date of Issue: 1 August 2017

PERIODIC TEST OF A SOUND LEVEL METER to IEC 61672-3:2006

FC	OR:	Enfonic Ltd
		Tecpro House
		IDA Business & Technology Park
		Clonshaugh
		Dublin 17
FOR THE ATTENTION (	OF:	Gary Duffy
PERIODIC TEST DATE:		01/08/2017
TEST PROCEDURE:		CTP12 (Laboratory Manual)
Sound Level Meter Details		
Manufacturer	Bruel &	ک Kjaer
Model 2250-L		·
Serial number 260276		3

Class	1	
Hardware version	2.0	Software version: BZ7130 Version 4.7.2
Associated Items	Microphone	Preamplifier
Manu	Bruel & Kjaer	Bruel & Kjaer
Model	4950	ZC 0032
Serial Number	2697054	12941

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# **APPENDIX 12-1**

Relevant Legislation, Policy and Guidelines



## **APPENDIX 12.1**

#### **Relevant Legislation, Policy and Guidelines**

This report has been prepared with regards to the following legislation, policy documents and guidelines as relevant:

- CIEEM (2015) Guidelines for Ecological Report Writing;
- CIEEM (2018) Guidelines For Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester;
- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government;
- European Commission (2018), Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg;
- EC (2002) Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission;
- EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. European Commission;
- EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission;
- EPA (2017) Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports. Environmental Protection Agency;
- EPA (2003), Advice Notes on current practice in the preparation of Environmental Impact Statements. Environmental Protection Agency;
- Fossitt, J., 2000. A Guide to Habitats in Ireland. The Heritage Council, Kilkenny;
- HA (2001) DMRB Volume 10 Section 4 Part 4 Ha 81/99 Nature Conservation Advice In Relation To Otters. The Highways Agency;
- National Parks and Wildlife Service (NPWS) (2013) The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland;
- NRA (2008) Environmental Impact Assessment of National Road Schemes A Practical Guide Rev. 1. National Roads Authority;
- NRA (2009) Guidelines for the Assessment of Ecological Impacts of National Road Schemes Rev. 2. National Roads Authority;
- NRA (2008) NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes). National Roads Authority;
- NRA Environmental Assessment and Construction Guidelines (both adopted and draft versions)

Studies were also carried out in accordance with the following legislation:-

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and Directive 2009/147/EC (codified version of Directive (79/409/EEC as amended ( (Birds Directive)) transposed into Irish law as European Communities (Birds and Natural Habitats) Regulations 2011;
- European Communities (Environmental Impact Assessment) Regulations, 1989 to 2006;
- European Communities (Environmental Liability) Regulations, 2008 (S.I. No. 547 of 2008);
- European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 84 of 1988);
- Flora Protection Order, 2015;
- Planning and Development Act, 2000 (as amended);
- Roads Acts 1993 to 2007(as amended);
- Water Framework Directive (2000/60/EC), and
- Wildlife Act (Revised).

#### Relevant Waterford CDP 2011- 2017 Objectives

Objective INE 4	To exist the future emerging of convince and restore at the Aimport the Council surgest the
Objective INF 4	To assist the ruture expansion of services and routes at the Airport, the Council support the
	lengthening and widening of the runway, subject to compliance with proper planning and
	sustainable development and in compliance with Article 6 of the Habitats Directive.
Deliev ENV/7	It is a policy of the Council to comply with the objectives, policies and Programme of
POIICY EINV 7	it is a policy of the council to comply with the objectives, policies and Programme of
	Measures of the Water Framework Directive and the South Eastern and South Western River
	Basin District Management Plans.
Policy NH 1	To implement and review the County Waterford Heritage Plan and Local Biodiversity Action
	Dis a serie with a level to close to the days and subject to available resources
	Plan in partnership with all relevant stakeholders and subject to available resources.
Policy NH 2	To conserve, manage and enhance the natural heritage, biodiversity, landscape and
	environment of County Waterford in recognition of its importance as a non-renewable
	resource the unique identity and character of the County and as a natural resource asset
Dellas NULO	The source of the defent of the contribution of the contribution of the source of the
POLICY NH 3	To ensure as far as possible that development does not impact adversely on wildlife habitats
	and species. In the interests of sustainability, biodiversity should be conserved for the
	benefit of future generations.
Policy NH 4	To protect plant, animal species and babitate which have been identified by the Habitate
FORCY INT 4	To protect plant, and a species and habitats which have been identified by the habitats
	Directive, Bird Directive, Wildlife Act (1976) and Wildlife (Amendment) Act 2000 and the
	Flora Protection order S.I. No. 94 of 1999.
Policy NH 6	To conserve the favourable conservation status of species and habitats within Special Areas
	of Conconvision and Special Protection Areas
	of conservation and special Protection Areas.
Policy NH 7	To assess all proposed developments which are likely to impact (directly or through indirect
	or cumulative impacts) on designated sites for nature conservation or sites proposed for
	designation and protected species in accordance with Appropriate Assessment of Plans and
	Broiste in Iroland Cuidence for Dianning Authorities issued by the Denottment of
	Projects in relation Guidance for Planning Authorities issued by the Department of
	Environment, Heritage and Local Government (2009).
Policy NH 8	To ensure a sufficient level of information is provided in development applications to enable
	a comprehensive screening for Appropriate Assessment to be undertaken and to enable a
	fully informed assessment of impacts on highly resity to be made. Ecological impact
	Tury morned assessment of impacts on blouversity to be made. Ecological impact
	assessments submitted in support of development proposals shall be carried out by
	appropriately qualified professionals and ecological survey work carried out at optimal
	survey time to ensure accurate collation of ecological data.
Objective NH 1	It is an objective of the Council to comply with Article 6 of the Habitats Directive at each
Objective NTT 1	it is an objective of the council to comply with Article of the Habitats Directive at each
	level of the development planning process from County Development Plan, Local Area Plan
	to project level to ensure that there is no significant adverse impact on the integrity of
	Natura 2000 sites and that the requirements of Articles 6(3) and 6(4) of the Habitats
	Directive are fully satisfied
Delin: NULO	The current of the the design of the second se
POLICY INH 9	To ensure that development proposals in areas identified as being of nature conservation
	value will not impact adversely on the integrity and habitat value of the site.
Policy NH 10	To protect and conserve pNHAs and NHAs in the County.
Policy NH 11	To encourage the retention and creation of sites of local biodiversity value, ecological
	The choice of the recention and creation of sites of nocal boundersity value, ecological
	corridors and networks that connect areas of high conservation value such as woodlands,
	hedgerows, earth banks and wetlands.
Policy NH 13	To ensure that the County's floodplains, wetlands and watercourses are retained for their
/ -	hindiversity and flood protection values
	The second
Policy NH 15	To maintain good ecological status of wetlands and watercourses in support of the
	provisions of the Water Framework Directive and Ramsar Convention.
Policy NH 16	The preservation of riparian corridors is a requirement for the protection of aquatic habitats
	and facilitation of nublic access to waterways. No development shall take place within a
	and related of public decess to water ways. No development shall take place within a
	buffer zone of 15m measured from the top of the riverbank.
Objective NH 3	buffer zone of 15m measured from the top of the riverbank.To protect riparian habitats along watercourses by maintaining an ecological buffer zone of
Objective NH 3	<ul> <li>buffer zone of 15m measured from the top of the riverbank.</li> <li>To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the</li> </ul>
Objective NH 3	<ul> <li>buffer zone of 15m measured from the top of the riverbank.</li> <li>To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where</li> </ul>
Objective NH 3	buffer zone of 15m measured from the top of the riverbank.         To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate
Objective NH 3	buffer zone of 15m measured from the top of the riverbank.         To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate.
Objective NH 3 Policy NH 17	buffer zone of 15m measured from the top of the riverbank.To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate.To protect hedgerows in all new developments, particularly species rich roadside and
Objective NH 3 Policy NH 17	buffer zone of 15m measured from the top of the riverbank.         To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate.         To protect hedgerows in all new developments, particularly species rich roadside and townland boundary hedgerows.
Objective NH 3 Policy NH 17 Policy NH 18	buffer zone of 15m measured from the top of the riverbank.         To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate.         To protect hedgerows in all new developments, particularly species rich roadside and townland boundary hedgerows.         To protect and preserve existing hedgerows and seek their replacement with new
Objective NH 3 Policy NH 17 Policy NH 18	buffer zone of 15m measured from the top of the riverbank.         To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate.         To protect hedgerows in all new developments, particularly species rich roadside and townland boundary hedgerows.         To protect and preserve existing hedgerows and seek their replacement with new hedgerows with paties of local provenance where their semenal is preserve during.
Objective NH 3 Policy NH 17 Policy NH 18	buffer zone of 15m measured from the top of the riverbank.         To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate.         To protect hedgerows in all new developments, particularly species rich roadside and townland boundary hedgerows.         To protect and preserve existing hedgerows and seek their replacement with new hedgerows with native species of local provenance where their removal is necessary during
Objective NH 3 Policy NH 17 Policy NH 18	buffer zone of 15m measured from the top of the riverbank.         To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate.         To protect hedgerows in all new developments, particularly species rich roadside and townland boundary hedgerows.         To protect and preserve existing hedgerows and seek their replacement with new hedgerows with native species of local provenance where their removal is necessary during the course of road works or other works. There will be a presumption against the removal
Objective NH 3 Policy NH 17 Policy NH 18	buffer zone of 15m measured from the top of the riverbank.         To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate.         To protect hedgerows in all new developments, particularly species rich roadside and townland boundary hedgerows.         To protect and preserve existing hedgerows and seek their replacement with new hedgerows with native species of local provenance where their removal is necessary during the course of road works or other works. There will be a presumption against the removal of hedgerows where there is a reasonable alternative.
Objective NH 3 Policy NH 17 Policy NH 18 Policy NH 25	buffer zone of 15m measured from the top of the riverbank.         To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate.         To protect hedgerows in all new developments, particularly species rich roadside and townland boundary hedgerows.         To protect and preserve existing hedgerows and seek their replacement with new hedgerows with native species of local provenance where their removal is necessary during the course of road works or other works. There will be a presumption against the removal of hedgerows where there is a reasonable alternative.         Where development is approved for sites containing known invasive species the planning.
Objective NH 3 Policy NH 17 Policy NH 18 Policy NH 25	buffer zone of 15m measured from the top of the riverbank.         To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate.         To protect hedgerows in all new developments, particularly species rich roadside and townland boundary hedgerows.         To protect and preserve existing hedgerows and seek their replacement with new hedgerows with native species of local provenance where their removal is necessary during the course of road works or other works. There will be a presumption against the removal of hedgerows where there is a reasonable alternative.         Where development is approved for sites containing known invasive species, the planning authority where appropriate the use of conditions for control and condications.
Objective NH 3 Policy NH 17 Policy NH 18 Policy NH 25	buffer zone of 15m measured from the top of the riverbank.         To protect riparian habitats along watercourses by maintaining an ecological buffer zone of at least 15m from the top of the watercourse riverbank. The Council will consult with the Fisheries Authority on the establishment and protection of riparian habitats where appropriate.         To protect hedgerows in all new developments, particularly species rich roadside and townland boundary hedgerows.         To protect and preserve existing hedgerows and seek their replacement with new hedgerows with native species of local provenance where their removal is necessary during the course of road works or other works. There will be a presumption against the removal of hedgerows where there is a reasonable alternative.         Where development is approved for sites containing known invasive species, the planning authority will consider, where appropriate, the use of conditions for control and eradication

Policy NH 26	The Council will promote awareness of invasive species and their management, and work
	with other agencies in the County to address the issue.



# **APPENDIX 12-2**

Bird Survey Data


## **APPENDIX 12.2**

#### **Bird Survey Details**

### Vantage Point Survey Details

Date	VP	Start Time	Duration (Hrs)	Precipitation	Cloud (Oktas)	Wind (Beaufort)	Visibility
29/06/2018	1	12:00	3	None	2	1	Good
29/06/2018	2	15:15	3	None	2	1	Good
19/07/2018	1	14:00	3	None	1	2	Good
19/07/2018	2	17:15	3	None	1	3	Good
01/09/2018	2	15:00	3	None	8	2	Good
28/02/2020	2	09:21	3	Light rain	8	4	3km
28/02/2020	1	12:25	3	None	8	4	6km
15/04/2020	2	09:50	6	None	1	2-3	8km
20/04/2020	1	10:20	6	None	2	2-3	8km
21/04/2020	2	14:33	6	Dry-light	8	3	6km
42/05/2020	4	00.42		UTIZZIE	-	2.4	CL
13/05/2020	1	09:43	6	None	5	3-4	бкт
15/05/2020	2	09:41	6	None	1	2-3	10km

#### **Hinterland Survey Locations**

Observation Point	Co-ordinates
1	52.15313,-7.08308
2	52.15987,-7.07542
3	52.17051,-7.06988
4	52.17476,-7.11977
5	52.16755,-7.13192
6	52.17028,-7.10638
7	52.17587,-7.07469

### Hinterland Survey Details

Survey Date	Start and Finish Times	High Tide Time	Weather Conditions
15/04/2020	09:05- 16:10	13:44	Cloud: 1/8, Rain: Dry, Wind: F 2-3, Visibility: 8km
23/04/2020	14:58- 20:46	19:17	Cloud: 1/8, Rain: Dry, Wind: F 3, Visibility: 10km
18/05/20	11:27-17:17	16:03	Cloud: 8/8, Rain: Dry, Wind: F 2, Visibility: 3- 5km

### Breeding Bird Survey Details

Date	Transect	Time	Weather Conditions
			Cloud: 0/8, Rain: Dry,
29/03/2020	1	09:58	Wind: F 2, Visibility:
			10km
			Cloud: 0/8, Rain: Dry,
29/03/2020	2	13:55	Wind: F 2, Visibility:
			10km
			Cloud: 2/8, Rain: Dry,
15/04/2020	2	09:14	Wind: F 2-3, Visibility:
			Good
			Cloud: 2/8, Rain: Dry,
20/04/2020	1	09:33	Wind: F 2, Visibility:
			Good
			Cloud: 5/8, Rain: Dry,
13/05/2020	1	09:02	Wind: F 3-4, Visibility:
			6km
			Cloud: 1/8, Rain: Dry,
15/05/2020	2	09:08	Wind: F 2-3, Visibility:
			10km



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS Us Mapping Reproduced Under Licence from the Ordnance Survey Ireland Licence No. EN 0001220 © Governme





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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS U Mapping Reproduced Under Licence from the Ordnance Survey Ireland Licence No. EN 0001220 © Governi



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Path: R:\Map Production\2020\P20-082\Workspace\P20-082\_GIS\_Flightlines\_A3.mxd

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Mapping Reproduced Under Licence from the Ordnance Survey Ireland Licence No. EN 0001220 © Government of Ireland





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Source: Esri, Digita

	Hinterland	Sites
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FIGURE	<b>NO:</b> 2	.2			
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Kadaster NL, Ordnance Survey, Esri Japan, METI, Source: Esri, DigitalGlobe, GeoEye, Earthstar Ge USDA, USGS, A ning Rei

Proposed North Extension (Phase 2)

Permitted South Extension (Phase 2)

Phase 3 (extension to width 7.5m)

Waterford Airport Runway Extension

FIGURE NO: -				
CLIENT:	CLIENT: Waterford Airport			
SCALE:	1:12500	REVISION:	0	
DATE:	07/07/2020	PAGE SIZE:	A3	
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CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

# **APPENDIX 12-3**

**Ecological Valuation Criteria** 


## **APPENDIX 12.3**

#### **Ecological Valuation**

Geographical Reference for Ecological Assessment

Ecological Valuation
International Importance:
'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI),
Special Protection Area (SPA) or proposed Special Area of Conservation.
Proposed Special Protection Area (pSPA).
Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive,
as amended).
Features essential to maintaining the coherence of the Natura 2000 Network.
Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
Resident or regularly occurring populations (assessed to be important at the national level) of the
following:
Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat
1971).
World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
Biosphere Reserve (UNESCO Man & the Biosphere Programme).
Site hosting significant species populations under the Bonn Convention (Convention on the
Conservation of Migratory Species of Wild Animals, 1979).
Site hosting significant populations under the Berne Convention (Convention on the Conservation of
European Wildlife and Natural Habitats, 1979).
Biogenetic Reserve under the Council of Europe.
European Diploma Site under the Council of Europe.
Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters)
Regulations, 1988, (S.I. No. 293 of 1988).
National Importance:
Site designated of proposed as a Natural Heritage Area (NHA).
Statutory Nature Reserve.
National Park
National Faix.
Nature Personal Pers
Resident or regularly occurring populations (assessed to be important at the national level) of the
following.
Species protected under the Wildlife Acts: and/or
Species listed on the relevant Red Data list
Site containing 'viable areas' of the babitat types listed in Annex I of the Habitats Directive
County Importance:
Area of Special Amenity.
Area subject to a Tree Preservation Order.
Area of High Amenity, or equivalent, designated under the County Development Plan.
Resident or regularly occurring populations (assessed to be important at the County level) of the
following:
Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive:
Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;

#### **Ecological Valuation**

Species protected under the Wildlife Acts; and/or

Species listed on the relevant Red Data list.

Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.

County important populations of species or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared.

Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.

Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

#### Local Importance (higher value):

Locally important populations of Priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;

Resident or regularly occurring populations (assessed to be important at the Local level) of the following:

Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;

Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;

Species protected under the Wildlife Acts; and/or

Species listed on the relevant Red Data list.

Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;

Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

#### Local Importance (lower value):

Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; Sites or features containing non-native species that are of some importance in maintaining habitat links.



## **APPENDIX 12-4**

Designated Sites within 15km of the Proposed Site



### **APPENDIX 12.4**

### Designated Sites Within 15km of Waterford Airport

Site Name and Code	Qualifying Interests	Distance from the Proposed Works	Connectivity
Hook Head SAC and pNHA (000764)	Annex I Habitats [1160] Large shallow inlets and bays [1170] Reefs [1230] Vegetated sea cliffs of the Atlantic and Baltic coasts	(km) <sup>1</sup> 11.6	There is potential remote and tenuous connectivity via the Kilmacleague West, Ballygarran and Ballygunnermore watercourses, which flow into Back Strand, c. 20km along the coast to the west of Hook Head SAC.
River Barrow And River Nore SAC (002162)	Annex II Species[1016] Desmoulin's whorl snail Vertigomoulinsiana[1029] Freshwater pearl mussel Margaritiferamargaritifera[1092]White-clawed crayfish Austropotamobiuspallipes[1095] Sea lamprey Petromyzon marinus[1096] Brook lamprey Lampetra planeri[1099] River lamprey Lampetra fluviatilis[1103] Twaite shad Alosa fallax[1106] Atlantic salmon (Salmo salar) (only in freshwater)[1355] Otter Lutra lutra[1421] Killarney fern Trichomanes speciosum[1990] Nore freshwater pearl musselMargaritifera durrovensisAnnex I Habitats[1130] Estuaries[1140] Mudflats and sandflats not covered byseawater at low tide[1330] Atlantic salt meadows (Glauco-Pucinellietalia maritimae)[1410] Mediterranean salt meadows (Juncetaliamaritime)[3260] Water courses of plain to montane levelswith the Ranunculion fluitanis and Callitricho-Batrachion vegetation[4030] European dry heaths[6430] Hydrophilous tall herb fringe communitiesof plains and of the montane to alpine levels	6.0	There is no hydrological or habitat connectivity.

<sup>&</sup>lt;sup>1</sup> Distance measured "as the crow flies"

		Distance	
Site Name and		from the	
Code	Qualifying Interests	Proposed	Connectivity
		Works	
		(km) <sup>1</sup>	
	[7220] * Petrifying springs with tufa formation		
	(Cratoneurion)		
	[91AU] Old sessile oak woods with liex and		
	Biechnum in the British Isles		
	[910] Alluvia lorests with Allus glutilosa and Fravinus excelsion ( Alno-Padion, Alnion incanae		
	Salicion albae)		
Tramore Dunes	Annex I Habitats	17	There is notential
And Backstrand	[1140] Mudflats and sandflats not covered by	1.7	indirect connectivity
SAC and pNHA	seawater at low tide		via the Kilmacleague
(000671)	[1210] Annual vegetation of drift lines		West, Ballygarran
<b>`</b>	[1220] Perennial vegetation of stony banks		and Ballygunnermore
	[1310] Salicornia and other annuals colonising		watercourses, which
	mud and sand		flow into the
	[1330] Atlantic salt meadows (Glauco-		Tramore Dunes And
	Puccinellietalia maritimae)		Backstrand SAC.
	[1410] Mediterranean salt meadows (Juncetalia		
	maritimi)		
	[2110] Embryonic shifting dunes		
	[2120] Shifting dunes along the shoreline with		
	Ammophila drenaria (white dunes)		
	[2130] Fixed coastal duries with herbaceous		
Lower River Suir	Anney II Species	49	There is no
SAC and pNHA	[1029] Freshwater Pearl Mussel Margaritifera	ч. <b>5</b>	hydrological or
(002137)	maraaritifera		habitat connectivity.
, , , , , , , , , , , , , , , , , , ,	[1092] White-clawed Crayfish Austropotamobius		,
	pallipes		
	[1095] Sea Lamprey Petromyzon marinus		
	[1096] Brook Lamprey Lampetra planeri		
	[1099] River Lamprey Lampetra fluviatilis		
	[1103] Twaite Shad Alosa fallax fallax		
	[1106] Salmon Salmo salar		
	[1355] Otter Lutra lutra		
	Annex I Habitats		
	[1550] Atlantic sait meadows (Gladco-		
	[1410] Mediterranean salt meadows (Juncetalia		
	maritimi)		
	[3260] Water courses of plain to montane levels		
	with the Ranunculion fluitantis and Callitricho-		
	Batrachion vegetation		
	[6430] Hydrophilous tall herb fringe communities		
	of plains and of the montane to alpine levels		
	[91A0] Old sessile oak woods with <i>llex</i> and		
	Blechnum in the British Isles		
	[91E0] Alluvial forests with Alnus glutinosa and		
	Fraxinus excelsior (Alno-Padion, Alnion incanae,		
	Salicioli divide) [9110] Taxas haccata woods of the Pritich Islas		
	[atio] Luxus purcata moods of the purish isles		

Site Name and Code	Qualifying Interests	Distance from the Proposed Works	Connectivity
Tramore Back	Bird Species:	(km) <sup>1</sup> 1.7	There is potential
Strand SPA (004027)	<ul> <li>[A046] Brent Goose Branta bernicla hrota</li> <li>[A140] Golden Plover Pluvialis apricaria</li> <li>[A141] Grey Plover Pluvialis squatarola</li> <li>[A142] Lapwing Vanellus vanellus</li> <li>[A149] Dunlin Calidris alpina alpina</li> <li>[A156] Black-tailed Godwit Limosa limosa</li> <li>[A157] Bar-tailed Godwit Limosa lapponica</li> <li>[A160] Curlew Numenius arquata</li> <li>[A999] Wetlands</li> </ul>		indirect connectivity via the Kilmacleague West, Ballygarran and Ballygunnermore watercourses, which flow into the Tramore Back Strand SPA.
Mid-Waterford Coast SPA (004193)	<b>Bird Species:</b> [A017] Cormorant <i>Phalacrocorax carbo</i> [A103] Peregrine <i>Falco peregrinus</i> [A184] Herring Gull <i>Larus argentatus</i> [A346] Chough <i>Pyrrhocorax pyrrhocorax</i>	6.5	Remote and tenuous connectivity via the the Kilmacleague West, Ballygarran and Ballygunnermore watercourses, which flow into Back Strand, c. 8km along the coast to the east of Mid-Waterford Coast SPA.
Lough Cullin pNHA (000406)	Lough Cullin is the only natural lake in south Kilkenny and occupies a low-lying depression 6km north of Waterford. The main interest of the site lies in its flowering plants some of which are rare in the Kilkenny and Waterford region. There is also a high population of Snipe in winter as well as smaller numbers of Curlew, Lapwing and Mallard. In summer Sedge Warbler and Reed Bunting breed.	12.4	There is no hydrological or habitat connectivity.
Grannyferry pNHA (000833)	The Blackwater is a small tributary of the River Suir in south Kilkenny joining the main river upstream of Waterford. This site consists of reed-swamp, marshes and wet fields with a salt influence which declines from south to north. Small numbers of Mallard and Water Rail occur within the area and in summer there are, most probably, Sedge Warbler and Reed Bunting nesting.	10.1	There is no hydrological or habitat connectivity.
Ballyhack pNHA (000695)	No site synopsis available.	9.3	There is no hydrological or habitat connectivity.
Ballyvoyle Head To Tramore pNHA (001693)	No site synopsis available.	6.6	There is potential remote and tenuous connectivity via the Kilmacleague West, Ballygarran and Ballygunnermore watercourses, which flow into Back Strand, c. 8.3km along the coast to the east of

Site Name and Code	Qualifying Interests	Distance from the Proposed Works (km) <sup>1</sup>	Connectivity
			Ballyvoyle Head To
Bannow Bay pNHA (000697)	No site synopsis available.	14.9	There is no hydrological or habitat connectivity.
Castlecraddock Bog pNHA (001695)	Castlecraddock Bog is an area of marsh, fen and swamp situated approximately 3.5km north- north-west of Annestown in Co. Waterford. There are several such small bogs in the county and as no two are exactly alike they are all of local ecological interest.	13.0	There is no hydrological or habitat connectivity.
Barrow River Estuary pNHA (000698)	No site synopsis available.	8.8	There is no hydrological or habitat connectivity.
Fennor Bog pNHA (001697)	Fennor Bog is a small wetland surrounded by low tufts about 5km west of Tramore. It is an area containing a variety of swamp, fen and bog communities. The interest of this site lies in the variety of wetland plant communities found in this area, and the abundance of Marsh St. John's-wort.	9.1	There is no hydrological or habitat connectivity.
Kilbarry Bog pNHA (001700)	Kilbarry Bog is located on the southern outskirts of Waterford City; it lies on either side of the former Great Southern Railway Line parts of which today are used as a foot path and cycle way. Kilbarry Bog is a site of conservation importance for a variety of reasons: it is the only remaining wetland of its type of significance in the vicinity of Waterford City, it supports a variety of wetland vegetation types and plant species, it is the site of records for the scarce Summer Snowflake, it supports a good diversity of birds, including an important breeding population of Reed Warbler and a range of scarce invertebrate species has been recorded from the site.	4.2	There is no hydrological or habitat connectivity.
King's Channel pNHA (001702)	No site synopsis available.	4.9	There is no hydrological or habitat connectivity.
Lissaviron Bog pNHA (001705)	Lissaviron Bog is situated 2km north-west of Annestown in Co. Waterford. This area of swamp, fen and developing bog lies very close to Castlecraddock Bog (0001695) but is completely different to it. There are several such small bogs in the county and as no two are exactly alike they are all of local ecological interest.	13.2	There is no hydrological or habitat connectivity.
Waterford Harbour pNHA (000787)	No site synopsis available.	6.1	The proposed site and this pNHA are situated in the same Groundwater Body <sup>2</sup> . However, review of

<sup>&</sup>lt;sup>2</sup> https://gsi.ie/Mapping.htm

Site Name and Code	Qualifying Interests	Distance from the Proposed Works (km) <sup>1</sup>	Connectivity
			local topography indicates that the site does not drain towards this pNHA and there is no hydrological or habitat connectivity.
Belle Lake pNHA (000659)	The south-east of Ireland has comparatively few lakes, Belle Lake is one of the larger of them. It is an attractive lake which lies at about 50m above sea level, 7km south east of Waterford city. As for any substantial lake and reed-bed, this is an important site or birds. In particular the lake is used by regionally important numbers of Whooper Swan. This is one of the few extensive water bodies in south-east Ireland and as such is of great importance within the region. It has a varied aquatic and wetland flora that is of scenic as well as scientific interest.	3.4	The proposed site and this pNHA are situated in the same Groundwater Body. However, review of local topography indicates that the site does not drain towards this pNHA and there is no hydrological or habitat connectivity.
Carrickavrantry Reservoir pNHA (000660)	This is a beautiful lake, situated in Co. Waterford, fringed by farmland to the south and east and forestry plantations to the west. The extraordinary interest of the flora of the west shore results in the reservoir being of regional scientific importance.	7.1	There is no hydrological or habitat connectivity.
Dunmore East Cliffs pNHA (000664)	Sandstone cliffs surround Dunmore East harbour in Co. Waterford rising to 20-30m in places. The cliffs are listed because they are the nesting colony of a large population of Kittiwake.	7.5	The proposed site and this pNHA are situated in the same Groundwater Body. However, review of local topography indicates that the site does not drain towards this pNHA and there is no hydrological or habitat connectivity.
Islandtarnsey Fen pNHA (000666)	Islandtarnsey is a small wetland lying at an altitude of about 60m and situated about 3km west of Tramore in Co. Waterford. Extensive reed-beds are characteristic here and are a valuable component of the natural history of any region. Although the area is shot over, especially by clay pigeon shooters, it harbours a typical bird fauna. Its association with the grassy marshland to the north adds to the variety and interest of the site.	7.1	There is no hydrological or habitat connectivity.
Duncannon Sandhills pNHA (001738)	No site synopsis available.	10.1	There is no hydrological or habitat connectivity.

\* indicates a priority habitat under the Habitats Directive



## **APPENDIX 12-5**

**NBDC** Data



### **APPENDIX 12.5**

#### **NBDC Records**

NBDC Species Records from within 2km of Waterford Airport (Excluding Birds)

Common and Scientific Name	Date of Last Record	Designation
Common Frog (Rana temporaria)	31/12/1994	Wildlife Acts
Smooth Newt (Lissotriton vulgaris)	20/03/2012	Wildlife Acts
Cherry Laurel (Prunus laurocerasus)	19/06/2005	High Impact Invasive Species
Chives (Allium schoenoprasum)	19/08/2006	Flora Protection Order
Common Cord-grass (Spartina anglica)	10/06/2011	Invasive Species Regulation S.I. 477 (Ireland)
Cottonweed (Otanthus maritimus)	30/11/1883	Flora Protection Order
Japanese Knotweed (Fallopia japonica)	21/05/2016	Invasive Species Regulation S.I. 477 (Ireland)
Lesser Centaury ( <i>Centaurium pulchellum</i> )	12/08/1899	Flora Protection Order
Rhododendron ponticum	22/03/2003	Invasive Species Regulation S.I. 477 (Ireland)
Three-cornered Garlic (Allium triquetrum)	28/02/2005	Invasive Species Regulation S.I. 477 (Ireland)
Wild Asparagus (Asparagus prostratus)	13/07/2003	Flora Protection Order
Marsh Fritillary (Euphydryas aurinia)	31/12/1990	Annex II
Common Porpoise ( <i>Phocoena phocoena</i> )	24/03/2006	Annex II, Wildlife Acts
Grey Seal (Halichoerus grypus)	09/12/2011	Annex II, Wildlife Acts
Narrow-mouthed Whorl Snail (Vertigo (Vertilla) angustior)	31/12/1940	Annex II, Wildlife Acts
American Mink ( <i>Mustela vison</i> )	22/04/2018	High Impact Invasive Species , Invasive Species Regulation S.I. 477 (Ireland)
Brown Rat ( <i>Rattus norvegicus</i> )	17/12/2014	High Impact Invasive Species , Invasive Species Regulation S.I. 477 (Ireland)
Eastern Grey Squirrel ( <i>Sciurus</i> carolinensis)	31/12/2007	High Impact Invasive Species, Invasive Species EU Regulation No. 1143/2014, Invasive Species Regulation S.I. 477 (Ireland)
Eurasian Badger (Meles meles)	31/12/2014	Wildlife Acts
Eurasian Pygmy Shrew (Sorex minutus)	03/10/2013	Wildlife Acts
European Otter (Lutra lutra)	04/02/2012	Annex II, Annex IV, Wildlife Acts
Fallow Deer (Dama dama)	31/12/2008	High Impact Invasive Species, Invasive Species Regulation S.I. 477 (Ireland), Wildlife Acts

Common and Scientific Name	Date of Last Record	Designation
Lesser Noctule ( <i>Nyctalus</i> <i>leisleri</i> )	25/07/2014	Annex IV, Wildlife Acts
Pipistrelle (Pipistrellus pipistrellus sensu lato)	25/07/2014	Annex IV, Wildlife Acts
Soprano Pipistrelle (Pipistrellus pygmaeus)	25/07/2014	Annex IV, Wildlife Acts
West European Hedgehog (Erinaceus europaeus)	07/06/2015	Wildlife Acts

### NBDC Bird Records from within 2km of Waterford Airport

Species Name	Common Name	Data Source <sup>3</sup>	Designation and Protection <sup>4</sup>
Barn Owl (Tyto alba)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Red List
Barn Swallow (Hirundo rustica)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Bar-tailed Godwit ( <i>Limosa lapponica</i> )	15/10/2017	Collated NBDC data	Wildlife Acts, Annex I Bird Species, Amber List
Black-headed Gull ( <i>Larus</i> ridibundus)	28/09/2012	Collated NBDC data	Wildlife Acts, Red List
Black-legged Kittiwake ( <i>Rissa</i> tridactyla)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Black-tailed Godwit ( <i>Limosa limosa</i> )	07/11/2013	Collated NBDC data	Wildlife Acts, Amber List
Brent Goose (Branta bernicla)	07/11/2013	Collated NBDC data	Wildlife Acts, Amber List
Common Coot (Fulica atra)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Common Goldeneye (Bucephala clangula)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Common Grasshopper Warbler ( <i>Locustella naevia</i> )	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Common Greenshank ( <i>Tringa</i> nebularia)	07/11/2013	Collated NBDC data	Wildlife Acts, Amber List
Common Guillemot ( <i>Uria aalge</i> )	29/02/1984	Lack (1986)	Wildlife Acts, Amber List
Common Kestrel (Falco tinnunculus)	11/12/2014	Collated NBDC data	Wildlife Acts, Amber List
Common Kingfisher ( <i>Alcedo atthis</i> )	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species, Amber List
Common Linnet (Carduelis cannabina)	07/11/2013	Collated NBDC data	Wildlife Acts, Amber List
Common Pochard (Aythya ferina)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List

<sup>3</sup> Data sourced from records held on the National Biodiversity Centre online database

<sup>4</sup> Designation and protection under the Irish Wildlife Acts, the EU Birds Directive and the Birds of Conservation Concern in Ireland (Colhoun and Cummins, 2013)

Species Name	Common Name	Data Source <sup>3</sup>	Designation and Protection <sup>4</sup>
Common Redshank ( <i>Tringa totanus</i> )	31/10/2014	Collated NBDC data	Wildlife Acts, Red List
Common Sandpiper (Actitis hypoleucos)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Common Scoter ( <i>Melanitta</i> nigra)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Red List
Common Shelduck ( <i>Tadorna tadorna</i> )	03/08/2016	Collated NBDC data	Wildlife Acts, Amber List
Common Snipe (Gallinago gallinago)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Common Starling (Sturnus vulgaris)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Common Swift (Apus apus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Common Tern ( <i>Sterna</i> hirundo)	31/07/1972	Lack (1986)	Wildlife Acts, Annex I Bird Species, Amber List
Corn Bunting (Emberiza calandra)	31/07/1972	Lack (1986)	Wildlife Acts
Corn Crake ( <i>Crex crex</i> )	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species, Red List
Dunlin ( <i>Calidris alpina</i> )	07/11/2013	Collated NBDC data	Wildlife Acts, Annex I Bird Species, Amber List
Eurasian Curlew ( <i>Numenius arquata</i> )	07/11/2013	Collated NBDC data	Wildlife Acts, Red List
Eurasian Oystercatcher (Haematopus ostralegus)	07/11/2013	Collated NBDC data	Wildlife Acts, Amber List
Eurasian Reed Warbler (Acrocephalus scirpaceus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Eurasian Teal (Anas crecca)	07/11/2013	Collated NBDC data	Wildlife Acts, Amber List
Eurasian Tree Sparrow (Passer montanus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Eurasian Wigeon (Anas penelope)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Eurasian Woodcock (Scolopax rusticola)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
European Golden Plover (Pluvialis apricaria)	28/09/2012	Collated NBDC data	Wildlife Acts, Annex I Bird Species, Red List
European Shag (Phalacrocorax aristotelis)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
European Turtle Dove (Streptopelia turtur)	31/07/1972	Lack (1986)	Wildlife Acts, Amber List
Gadwall (Anas strepera)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Goosander (Mergus merganser)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Great Black-backed Gull (Larus marinus)	28/09/2012	Collated NBDC data	Wildlife Acts, Amber List

Species Name	Common Name	Data Source <sup>3</sup>	Designation and Protection <sup>4</sup>
Great Cormorant (Phalacrocorax carbo)	07/11/2013	Collated NBDC data	Wildlife Acts, Amber List
Great Crested Grebe ( <i>Podiceps</i> cristatus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Great Northern Diver ( <i>Gavia immer</i> )	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species
Greater Scaup (Aythya marila)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Greater White-fronted Goose (Anser albifrons)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species, Amber List
Grey Partridge (Perdix perdix)	31/07/1972	Lack (1986)	Wildlife Acts, Red List
Grey Plover ( <i>Pluvialis</i> squatarola)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Greylag Goose (Anser anser)	31/12/2011	Balmer <i>et al</i> . (2013)	Invasive Species Regulation S.I. 477 (Ireland), Wildlife Acts, Amber List
Hen Harrier (Circus cyaneus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species, Amber List
Herring Gull (Larus argentatus)	28/09/2012	Collated NBDC data	Wildlife Acts, Red List
House Martin (Delichon urbicum)	02/09/2015	Collated NBDC data	Wildlife Acts, Amber List
House Sparrow (Passer domesticus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Lesser Black-backed Gull (Larus fuscus)	22/10/2012	Collated NBDC data	Wildlife Acts, Amber List
Little Egret (Egretta garzetta)	31/10/2014	Collated NBDC data	Wildlife Acts, Annex I Bird Species
Little Grebe (Tachybaptus ruficollis)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Little Gull (Larus minutus)	29/02/1984	Lack (1986)	Wildlife Acts, Annex I Bird Species
Little Tern (Sternula albifrons)	31/07/1972	Lack (1986)	Wildlife Acts, Annex I Bird Species, Amber List
Mediterranean Gull (Larus melanocephalus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species, Amber List
Merlin (Falco columbarius)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species, Amber List
Mew Gull (Larus canus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Mute Swan (Cygnus olor)	19/04/2013	Collated NBDC data	Wildlife Acts, Amber List
Northern Gannet ( <i>Morus bassanus</i> )	29/02/1984	Lack (1986)	Wildlife Acts, Amber List
Northern Lapwing (Vanellus vanellus)	07/11/2013	Collated NBDC data	Wildlife Acts, Red List
Northern Shoveler (Anas clypeata)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Red List
Northern Wheatear (Oenanthe oenanthe)	31/07/1991	Gibbons <i>et al.</i> (1993)	Wildlife Acts, Amber List
Peregrine Falcon (Falco peregrinus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species

Species Name	Common Name	Data Source <sup>3</sup>	Designation and Protection <sup>4</sup>
Razorbill (Alca torda)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Red Knot (Calidris canutus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Red List
Red-billed Chough (Pyrrhocorax pyrrhocorax)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species, Amber List
Red-breasted Merganser (Mergus serrator)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts
Red-throated Diver ( <i>Gavia stellata</i> )	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species, Amber List
Ringed Plover (Charadrius hiaticula)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Rock Pigeon (Columba livia)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts
Sand Martin (Riparia riparia)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Sandwich Tern (Sterna sandvicensis)	31/07/1991	Gibbons <i>et al</i> . (1993)	Wildlife Acts, Annex I Bird Species, Amber List
Short-eared Owl (Asio flammeus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species, Amber List
Sky Lark (Alauda arvensis)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Spotted Flycatcher ( <i>Muscicapa striata</i> )	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Stock Pigeon (Columba oenas)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Tufted Duck (Aythya fuligula)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Water Rail (Rallus aquaticus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Amber List
Whooper Swan (Cygnus cygnus)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Annex I Bird Species, Amber List
Yellowhammer (Emberiza citrinella)	31/12/2011	Balmer <i>et al</i> . (2013)	Wildlife Acts, Red List



## **APPENDIX 13-1**

Archaeological Inventory Entries



## **APPENDIX 13.1 – Archaeological Inventory Entries**

Monument No.	Classification	Description
WA017-064	Graveyard	Situated in pasture on a N-S ridge. The church of Killowen was described as 'in good repair' in 1615 (Anon. 1902, 113), and this location is denoted 'Site of Killowen Graveyard' on the 1840 ed. of the OS 6-inch map. There are slight traces of a rectangular area (dims. c. 40m E-W; c. 35m N-S) defined by slight scarps visible c. 30m NE of rath (WA017-065), and locally it is known that bones have been found in building work in a farmyard c. 20m to the W.
WA017-065	Ringfort - rath	Situated on the summit of a N-S ridge. Circular grass-covered platform (diam. at top 22.5m N-S; 22m E-W; diam. of base 30m N-S; 29.5m E-W; H 1.5-3.1m), with slight traces of a fosse (Wth c. 8m; ext. D 0.6m) SE-NW. Killowen graveyard (WA017-064) is c. 30m to the NE.
WA018-064	Burnt mound	Situated in pasture on the W bank of the N-S stream Keiloge stream. There is local information about the levelling of a mound of broken and burnt stone during land reclamation. It is not visible at ground level in pasture.
WA027-001	Redundant record	This record was formerly classed as 'Earthwork (s)' in the SMR (1988) based on its appearance on an aerial photograph (ACAP V 165/106-7). When inspected on the 05/06/1989, no archaeological remains were identified. The evidence from the aerial photograph is not sufficient to warrant its acceptance as an archaeological monument.
WA027-002	Redundant record	This record was formerly classed as 'Enclosure' in the SMR (1988) based on its appearance on an aerial photograph (ACAP V 165/79-80). When inspected it was forested and no archaeological remains were identified. The evidence from the aerial photograph is not sufficient to warrant its acceptance as an archaeological monument.
WA027-003	Church	Situated at the crest of an E-facing slope within a trivallate enclosure (see WA027-003010-) which has been suggested as 'the site of an early church' (Power 1952, 215). Excavations undertaken on the site in 1940 by M.J. Bowman uncovered a series of postholes which he considered represented a rectangular wooden structure and interpreted as the remains of an early wooden church (Curtin 2015, 31). Power, on the other hand, was more circumspect with regard to its interpretation suggesting that it might indicate a 'primitive oratory, residence or cattle shed' (Power 1941, 63-4), a sentiment echoed by Ó Carragáin (2010, 137). (Power 1941, 1952; Moore 1999, 165-6; Curtin 2015)
WA027-003001-	Burial ground	Situated at the crest of an E-facing slope on a slight N-S ridge. Power (1952, 215) considered this to be the site of an early church of which practically all trace had disappeared. The visible remains consist of a sub-circular scrub-covered area (diam. 27m) (WA027-003002-) defined by the remnants of a stone wall (Wth 1.8m) generally reduced to a scarp (H c. 0.6m). This enclosure (WA027-003002-) is traditionally considered to be a burial ground (WA027-003003-), and there is one grave-marker in the interior which is raised and stony. It corresponds with the SE quadrant of a much larger sub-circular trivallate monument (WA027-003010-) which was revealed as a result of geophysical survey undertaken in 2007 (Bonsall and Gimson 2007). The survey also indicated the existence of a possible annex to the S. A pillar stone (WA027-003003-) incised with a plain equal-armed cross stands on its perimeter at E. The monument was investigated by M.J. Bowman in 1940 who revealed that the 'graveyard' component was in the SE quadrant of the original

Monument No.	Classification	Description
		enclosure. Geophysical survey undertaken in 2007 (Bonsall and Gimson 2007) demonstrated that the monument was a trivallate enclosure with an internal diameter of 95m. A reassessment of Bowman's excavations (Curtin 2015) indicates a multiphase site. The pottery recovered (B ware and E ware) suggests occupation in the medieval period and the presence of Leinster cooking ware is indicative of occupation in the 13th-14th centuries. Evidence of iron working indicates that the site was used during the late medieval or early modern period and a final period of use of the site was as a burial ground (ibid., 86). Evidence for burial consisted of two empty stone-lined graves, three cists and pits containing human remains (Curtin 2015, 1). (Power 1941; 1952, 215; Moore 1999, 165-6; Bonsall and Gimson 2007; Curtin 2015)
WA027-003002-	Enclosure	Situated at the crest of an E-facing slope on a slight N-S ridge. The visible remains consist of a sub-circular scrub-covered area (diam. 27m) defined by the remnants of a stone wall (Wth 1.8m) generally reduced to a scarp (H c. 0.6m). This enclosure (WA027-003002-) is traditionally considered to be a burial ground, and there is one grave-marker in the interior which is raised and stony. It corresponds with the SE quadrant of a much larger sub-circular tri-vallate monument (WA027-003010-) which was revealed as a result of geophysical survey undertaken in 2007 (Bonsall and Gimson 2007). The survey also indicated the existence of a possible annex to the S. A pillar stone (WA027-003003-) incised with a plain equal-armed cross stands on its perimeter at E. The monument was investigated by M.J. Bowman in 1940 who revealed that the 'graveyard' component was in the SE quadrant of the original enclosure. Geophysical survey undertaken in 2007 (Bonsall and Gimson 2007) demonstrated that the monument was a trivallate enclosure with an internal diameter of 95m. A reassessment of Bowman's excavations (Curtin 2015) indicates a multiphase site. The pottery recovered (B ware and E ware) suggests occupation in the medieval period and the presence of Leinster cooking ware is indicative of occupation in the 13th-14th centuries. Evidence of iron working indicates that the site was used during the late medieval or early modern period and a final period of use of the site was as a burial ground (ibid., 86). (Power 1941; 1952, Moore 1999, 165-6: Bonsall and Gimson 2007: Curtin 2015)
WA027-003003-	Cross-inscribed stone	Situated at the crest of an E-facing slope on a slight N-S ridge, Power (1952, 215) considered this to be the site of an early church of which practically all trace had disappeared. The visible remains consist of a sub-circular scrub-covered area (diam. 27m) (WA027-003002-) defined by the remnants of a stone wall (Wth 1.8m) generally reduced to a scarp (H c. 0.6m). This enclosure (WA027-003002-) is traditionally considered to be a burial ground (WA027-003003-), and there is one grave-marker in the interior which is raised and stony. It corresponds with the SE quadrant of a much larger sub-circular trivallate monument (WA027-003010-) which was revealed as a result of geophysical survey undertaken in 2007 (Bonsall and Gimson 2007). The survey also indicated the existence of a possible annex to the S.

Monument No.	Classification	Description
		of the original enclosure. Geophysical survey undertaken in 2007 (Bonsall and Gimson 2007) demonstrated that the monument was a trivallate enclosure with an internal diameter of 95m. A reassessment of Bowman's excavations (Curtin 2015) indicates a multiphase site. The pottery recovered (B ware and E ware) suggests occupation in the medieval period and the presence of Leinster cooking ware is indicative of occupation in the 13th-14th centuries. Evidence of iron working indicates that the site was used during the late medieval or early modern period and a final period of use of the site was as a burial ground (ibid., 86). Apart from the possible burial marker evidence for burial consisted of two empty stone-lined graves, three cists and pits containing human remains (Curtin 2015, 1). (Power 1941; 1952, 215; Moore 1999, 165-6; Bonsall and Gimson 2007; Curtin 2015)
WA027-003004-	Redundant record	This record was formerly classed as 'Wall' in the SMR (1988). This 'wall' is part of enclosure (WA027-003002-) and is not a separate monument.
WA027-003005-	Structure	Situated at the crest of an E-facing slope within a trivallate enclosure (see WA027-003010-) which has been suggested as 'the site of an early church' (Power 1952, 215). In the course of excavations undertaken on the site in 1940 M.J. Bowman uncovered a series of postholes and paving in the SE quadrant of the enclosure (WA027-003002-) which he interpreted as the remains of a structure (Curtin 2015, 31). (Power 1941; 1952; Moore 1999, 165-6; Curtin 2015)
WA027-003006-	Cross-slab	Situated at the crest of an E-facing slope within a trivallate enclosure (see WA027-003010-) which has been suggested as 'the site of an early church' (Power 1952, 215). In the course of excavations undertaken on the site in 1940 M.J. Bowman unearthed 'a small irregularly shaped flagstone bearing an incised cross of Greek type, about six inches in length and rudely cut and lengthened by a later hand into a Latin cross.' (Power 1941, 63-4). Bowman suggested that 'this cross-inscribed stone may have been removed from its original position; its presence, however, on a site which resemebled a grave, suggests a burial.' (Curtin 2015, 93). The present location of this possible cross-slab is unknown: its last know provenance is recorded by Bowman in 1941 as at 'Canon Power's house' (Curtin 2015, 137). (Power 1941; 1952; Moore 1999, 165-6; Curtin 2015)
WA027-003007-	Metalworking site	Situated at the crest of an E-facing slope within a trivallate enclosure (see WA027-003010-) which has been suggested as 'the site of an early church' (Power 1952, 215). In the course of excavations undertaken on the site in 1940 M.J. Bowman recovered large quantities of 'iron' (between 100 and 150 kg) which together with a 'furnace' feature and fragments of a possible tuyere indicates a period of intense iron working on site (Curtin 2015, 139-40) which may date to the early modern period.
WA027-003008-	Well	Situated at the crest of an E-facing slope within a trivallate enclosure (see WA027-003010-) which has been suggested as 'the site of an early church' (Power 1952, 215). In the course of excavations undertaken on the site in 1940 M.J. Bowman uncovered a stone-line pit or well (diam. c. 0.6m; D 2.63m) (Curtin 2015, 32-3). (Power 1941; 1952; Curtin 2015)
WA027-003009-	Bullaun stone	Situated at the crest of an E-facing slope within a trivallate enclosure (see WA027-003010-) which Power (1952, 215) suggested as 'the site of an early church' and who also recorded that a 'bullán of ancient type was removed from the site about 50 years ago [i.e. c. 1900].'.

Monument No.	Classification	Description
WA027-003010-	Ecclesiastical enclosure	Situated at the crest of an E-facing slope on a slight N-S ridge. Power (1952, 215) considered this to be the site of an early church of which practically all trace had disappeared. The visible remains consist of a sub-circular scrub-covered area (diam. 27m) (WA027-003002-) defined by the remnants of a stone wall (Wth 1.8m) generally reduced to a scarp (H c. 0.6m). This enclosure (WA027-003002-) is traditionally considered to be a burial ground (WA027-003003-), and there is one grave-marker in the interior which is raised and stony. It corresponds with the SE quadrant of a much larger sub-circular trivallate monument (WA027-003010-) the full extent of which was revealed as a result of geophysical survey undertaken in 2007 (Bonsall and Gimson 2007); this provides an internal diameter of 80m and an external one of 95m for the enclosing elements. The survey also indicated the existence of a possible annex to the S. The monument was investigated by M.J. Bowman in 1940 and a reassessment of his results (Curtin 2015) indicates a multiphase site. The pottery recovered (B ware and E ware) suggests occupation in the medieval period and the presence of Leinster cooking ware is indicative of occupation in the 13th-14th centuries. Evidence of iron working indicates that the site was used during the late medieval or early modern period and a final period of use of the site was as a burial ground (WA027-003001-; ibid., 86). The onomastic evidence coupled with the presence of a grave-marker, a possible cross-slab (WA027-003006-) and the cross-inscribed pillar stone (WA027-003003-) clearly indicates an ecclesiastical context in terms of its occupation or use. (Power 1941; 1952, 215; Moore 1999, 165-6; Bonsall and Gimson 2007; Curtin 2015)
Wh027 004		based on its appearance on an aerial photograph (ACAP V 165/79- 80). Following inspection in 1989, it was concluded to be 'an old field bank'. The evidence is not sufficient to warrant its acceptance as an archaeological monument.
WA018-084	Barrow - ditch barrow	Situated at the bottom of a gentle N-facing slope in a low col with the summits of hills rising c. 570m to the NNW and c. 630m to the E. It was first identified as a possible monument in remote sensing (07R3) for the re-alignment of the R708 Airport road and confirmed in a test excavation (07E0347) by O. Scully (2007d) when an urn burial was recovered. It was fully excavated by D. J. Lalonde under the same licence
WA018-084001-	Pit-burial	Situated at the E edge of ditch-barrow (WA018-084), which is in a low col with the summits of hills rising c. 570m to the NNW and c. 630m to the E. A pit-burial was discovered in a test excavation (07E0347) by O. Scully (2007d) and consists of a Collared Urn in a stone-lined pit (diam. of top 0.55m; D c. 0.5m). Two pit burials (WA018-084002- and WA018-084003-) are immediately adjacent
WA018-084002-	Pit-burial	Situated at the E edge of ditch-barrow (WA018-084), which is in a low col with the summits of hills rising c. 570m to the NNW and c. 630m to the E. It was recorded during the complete excavation (07E0347) of the barrow by J. D. Lalonde (2008) and consists of a Collared Urn in an unlined pit (diam. 0.45m; D 0.45m). Two further pit burials (WA018-084001- and WA018-084003-) are immediately adiacent
WA018-084003-	Pit-burial	Situated at the E edge of ditch-barrow (WA018-084), which is in a low col with the summits of hills rising c. 570m to the NNW and c. 630m to the E. A pit-burial was recorded during the complete

Monument No.	Classification	Description
		excavation (07E0347) of the barrow by J. D. Lalonde (2008) and
		consists of a miniature Collared Urn in a stone-lined pit (diam. 0.25m;
		D 0.2m). Two further pit burials (WA018-084001- and WA018-
		084002-) are immediately adjacent



# **APPENDIX 13.2**

**Excavations Database Entries** 



### **APPENDIX 13.2 – Excavations Database Entries**

Location	Licence No.	Description
Airport Business Park, Kilowen, County Waterford	03E1195	This development was located at the southern periphery of the Airport Business Park, to the south-east of Waterford Airport. The site is located close to Ballylough, the focus of the Ballylough field- walking project of the 1980s, which demonstrated Late Mesolithic activity in East Waterford.
		The mid-brown, lightly grassed, silty topsoil varied in depth from 0.3 to 0.5m across the site. Beneath the topsoil was an orange/brown silty clay natural with occasional stones. Occasional pockets of orange and yellow natural clays were also observed. No finds or features of archaeological significance were uncovered.
Monamintra, County	07E0347	Excavations revealed a unique and varied site, with use from at least
Waterford		in diameter was excavated. Within the enclosing ditch measuring c. 15m in diameter was excavated. Within the enclosing ditch three collared urn cremation burials and seven cremation burials were recovered. In addition to the burials, numerous cuts representing pits, post- and stake-holes were revealed. A feature with oxidisation and evidence of in situ burning may represent the remains of a pyre, a hearth, or an industrial activity. Six pieces of worked flint, 28 pieces of prehistoric pottery, two pieces of preserved wood and the stone lining from one of the cremation burial pits were recovered. These features are recorded in the SMR also (WA018-084, WA018-084001-, WA018-084002- & WA018-084003-)



## **APPENDIX 13.3**

Field Inspection Notes



## Appendix 13.3 – Field inspection notes

Area	Description
North runway	The proposed north runway extension will originate at the terminus of the existing runway and extend in an approximate northeast direction across airside lands until meeting the present north-eastern boundary where it will proceed generally in the same direction through private agricultural lands. In short, the proposed northern runway extension will affect 3 fields in total, descriptions of which are provided below.
	<b>Field 1</b> The north-eastern airside lands encompass a large irregular area of undulating meadow and scrub land. The terrain is uneven in places with scrub vegetation and tall grasses spread throughout. The northwestern side of the field is dominated by small stands of trees and bushes with overgrown tree-stumps towards the north-eastern corner indicating recent deforestation. Tall modern concrete post and wire-mesh fencing form the boundaries on all sides. Recent (2015) aerial imagery depicts several individual fields within this section of the airport however, ground investigation showed most to of the field boundaries to have been recently removed. Some remnants of these boundaries do survive most noticeable a gorse-lined fence adjacent to the western perimeter which marks the line of the townland boundary between Ballygarran and Castletown.
	The majority c.378m of the proposed runway will be contained within the existing airside boundary. The proposed runway follows a slight rise in the terrain to the northeast to the existing airport boundary. The ground is relatively flat here and the grass is cut low along the centre of the corridor as part of the maintenance for the current navigation lights corridors. An access track measuring approximately 7m wide traverses east-west across the lights corridor before it sweeps to the northeast flaking the proposed runway. Ground disturbance in the form of underground electric cables providing power to the various light panels can be expected along this navigation corridor.
	In sum nothing of archaeological significance was noted along the proposed north runway extension within the north-eastern airside lands.
	<b>Field 2</b> Trapezoidal shaped field measuring c.187m northeast to southwest by c.146m northwest to southeast at its midpoint [c.2.1]. Shown as three full fields and one partial field on the 1 <sup>st</sup> edition OS map and two complete fields on the 25-inch OS map. Reactively flat, well maintained pasture field which gently slopes northwards. Present navigation lights corridor run northeast through the field. The panels are fenced and evenly spaced throughout the interior. Bound to the south by the airport perimeter fence and in all other areas by a low earthen bank topped with small trees and bushes and flanked by narrow drainage ditches. Western boundary is also the townland boundary. Proposed runway will extend into the southwestern end of the field while the proposed lighting corridor will continue in a NE direction through the entire field into Field 3.
	<b>Field 3</b> Irregular shaped field measuring c.170m northwest to southeast at the northeast by c.60m northeast to southwest at the north [c.0.9 ha]. Shown as one complete field and a portion of another on the 1 <sup>st</sup> edition OS map and same as current form on the 25-inch map. Residential property to the north and R708 to the northeast. Flat pasture field with a gentle slope towards the public road to the north. Bound on all sides by well-maintained semi-mature trees and bushes cut to an even

Area	Description
	height. Except to the north where the boundary consists of a hedgerow fronting a modern timber fence. One current light panel array is present at the northeast corner of the field. The proposed new light corridor will extend north-eastwards through this field terminating at its northeast corner.
South runway	The proposed south runway extension will originate at the terminus of the existing runway and extend in an approximate southwest direction and will be contained within the existing airside lands. The south west land parcel of the airport consists of 3 fields two of which will be directly affected by the proposed runway. All the fields area described below.
	<b>Field 4</b> Irregular form measuring c.522m north to south at the west by c.246m east to west at the north [c.8,9ha]. Shown as three full fields and three portions of larger fields on both the 1 <sup>st</sup> and 2 <sup>nd</sup> edition OS maps. The terrain is relatively flat with a sight slope to the southeast and consists of meadow and tall grasses to the north and centre and scrubland to the south. The northern most section consists of a hardstand attesting to ground works taken place here during the original runway construction. The field is open to the runway at the north, bound by the existing airside fencing to the south and northeast and a tall tree lined hedgerow to the south. The western boundary consists of a moderate earthen bank topped with semi-mature trees and overgrown in places with thickets of brambles and gorse bushes.
	Runway extension joins the existing runway to the north before running SW through the western portion of the field for approximately 300m before it breaks through the eastern field boundary of Field 5. Tall grasses interspersed with thistles and brambles dominated the terrain within this corridor except in the areas flanks the existing runway which comprise modern hardcore. Navigation lighting panels and an access road are aligned centrally along the proposed runway corridor also.
	In sum nothing of archaeological significance was noted along the proposed south runway extension within Field 4.
	<b>Field 5</b> Irregular triangular field measuring c.619m north to south by c.60m east to west at its midpoint [c.3.6ha]. Shown as two full fields and a portion of a larger field on the 1 <sup>st</sup> edition OS map and 2 full fields on the 25-inch OS map. A farmstead depicted adjacent to the western boundary at the centre of the field on the 1 <sup>st</sup> edition OS map has been levelled by the completion 25 -inch map, although the access road to the farmstead is still depicted.
	Internally the terrain is relatively flat and slopes gently to the south. A disused access trackway skirts the centre of the field with ferns and bushes to its west and tall grasses to the east. Remains of old field boundaries, consisting of overgrown field banks and drains traverse the south end of the field. Field 5 is bound by the airport perimeter fence to the east and south and an overgrown moderate earthen bank topped with tall trees and gorse bushes every else. The proposed southern runway and its approach lighting system will extend south eastwards through the southern portion of the field terminating before a
	wedge-shaped area of forestry which is excluded from the proposed development.
	In sum nothing of archaeological significance was noted along the proposed north runway extension within Field 5

Area	Description
	<b>Field 3</b> Irregular form measuring c.430m north to south at the east by c.100m east to west at south [c.3.3ha]. Open to the runway at the north the terrain is undulating and covered in tall grasses, reeds and thistles. The surface is uneven in places and there is a moderate drop in the ground level towards the southeast corner. Hight quantities of reeds present attest to poor drainage in wet weather. The boundaries consist of the airport perimeter fence to the west and south and a line of tall trees and bushes to the east. All the boundaries are overgrown with dense vegetation spilling into the interior in places. Shown as three full fields and portions of two others on the 1 <sup>st</sup> edition OS map and two full fields and a portion of another on the 25-inch map.
Car Park A	Rectangular shaped area measuring c.100m northeast to southwest at the west by c.65 m east to west at the north [c.0.8ha]. Depicted as 3 portions of larger fields on the 1 <sup>st</sup> edition OS map and 2 portions of larger fields on the 25-inch map. Consists of two lawns enclosing a stand of woodland to the east of the current terminal carpark. The woodland is covered in dense vegetation consisting of semi- mature trees, gorse bushes and thickets of brambles. The western lawn has is well maintained, has a max width of 30m at its southwest corner and occupies a naturally occurring ridge. The southern lawn is well maintained, flat and has a max width of 6m. Nothing of archaeological significance was noted within the proposed footprint of Carpark A
Car Park B	Rectangular shaped area measuring c.120m east to west at the north by 64m north to south at the east [c.0.9ha]. Extends over 4 portions of larger fields on the 1 <sup>st</sup> edition OS map and 2 portions of larger fields on the 25-inch map. Occupies the same location as Carpark A (see above) and nothing of archaeological significance was noted within the proposed footprint of Carpark B
Car Park C	Irregular shaped are measuring c.130m northwest to southeast at the north by c.78m northeast to southwest at the west c. [0.8ha]. Three portions of larger fields on the early historic maps. Located within the airport footprint to the east of the main terminal. The area comprises both brown and green field sections. The green field section consists of a wedge shape area of lawn to the north and east which is well maintained and relatively flat. An area of rough grassland primaly made up of thistles rushes and moderately tuffs of grass, divides the lawn from a disused carpark to the west. The scrubland is uneven with small surface undulations spread throughout. Rubble and building material from the adjacent carpark are noticeable internally. An overgrown field drain traverses the scrubland in a north-south direction which denotes the line of the townland boundary between Killowen to the west and Ballygarran to the south. The site is bounded by road carriageways to the north and west and airport fencing to the south. Nothing of archaeological significance was noted within the proposed footprint of Carpark C.


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# **APPENDIX 13.4**

Photographic Record



## Appendix 13.4 – Photographic Record

#### Proposed North Extension



Plate 13.1: View towards the proposed north runway extension, looking southwest



Plate 13.2: View towards the proposed north runway extension, looking northeast



Plate 13.3: Northern perimeter access road traversing the proposed runway extension, looking west



Plate 14. 4: Western airport boundary, looking south



*Plate 13.5: Overgrown tree stumps indicating deforestation adjacent to the northwestern boundary of the airport* 



*Plate 13.6: Remnants of the townland boundary to the west of the proposed north runway extension, looking southwest.* 



Plate 13.7: Overgrown field drain demarking an old field system adjacent to the existing north runway.



Plate 13.8: Field 2, proposed location for the navigation lights corridor for the northern runway, looking north



Plate 13.9: Western boundary of Field 2 which is also a townland boundary, looking north



Plate 13.10: Field 3, proposed location for the navigation lights corridor for the northern runway, looking northwest



Plate 13.11: Eastern boundary of Field 3, looking northwest

### Proposed South runway extension



Plate 13.12: Proposed south runway extension area, looking southwest



Plate 13.13: View further south



Plate 13.14: Proposed south runway extension looking northeast



Plate 13.15: Example of hardstand surviving to the east of the proposed southern runway



Plate 13.16: Field 5 in the southern airside section., looking south



Plate 13.17:Field boundary dividing Field 4 from Field 5



Plate 13.18: Field 6, looking southeast

#### CARPARKS



Plate 13.19: View south of proposed location of Carparks A & B.



Plate 13.20: View west showing proposed location of Carparks A & B



Plate 13.21: Internal view of the prosed location of Carparks A & B



Plate 13.22: Proposed location of Carpark C



Plate 13.23: Partial remains of townland boundary which extends north-south through the landholding



Plate 13.24: View of location of 'redundant record' WA027-001



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# **APPENDIX 13.5**

Figures



#### Appendix 13.5 – Figures



Figure Error! No text of specified style in document..5.1:Overview of the proposed development showing locations of recorded archaeological sites within the study area



Figure Error! No text of specified style in document..5.2: Overview of site showing the various elements of the proposed development



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