

Remedial Environmental Impact Assessment Report (rEIAR)

Volume 1: Non-Technical Summary and Main Report

Peat Extraction at
Ballydermot, Co Kildare and
Co Offaly.



TABLE OF CONTENTS

1. INTRODUCTION.....	1-1
1.1.1 References to Project Phases	1-2
1.2 Legislative Context.....	1-2
1.2.1 Remedial EIA Legislative Context.....	1-2
1.2.2 EIA Legislative Context.....	1-4
1.3 The Applicant.....	1-4
1.4 Project Description	1-5
1.5 Background to the Application	1-6
1.6 Site Location	1-7
1.7 Site Context	1-11
1.7.1 Lullymore Bog.....	1-15
1.7.2 Glashabaun North Bog	1-15
1.7.3 Glashabaun South Bog	1-15
1.7.4 Codd 1 Bog.....	1-15
1.7.5 Codd 2 Bog.....	1-16
1.7.6 Ballydermot North Bog.....	1-16
1.7.7 Ballydermot South Bog.....	1-16
1.7.8 Blackriver Bog	1-16
1.7.9 Ticknevin Bog.....	1-17
1.7.10 Barnaran Bog.....	1-17
1.7.11 Lodge Bog.....	1-17
1.7.12 Killina Bog	1-17
1.7.13 Lullybeg Bog.....	1-18
1.7.14 Derrybrennan Bog.....	1-18
1.8 Purpose and Scope of the rEIA.....	1-18
1.8.1 General Structure	1-19
1.8.2 Description of the Likely Significant Effects and Impacts	1-19
1.9 Project Team	1-22
1.9.1 Project Team Responsibilities.....	1-22
1.9.2 Project Team Members	1-24
1.9.2.1 MKO	1-24
1.9.2.2 Hydro Environmental Services.....	1-31
1.9.2.3 AWN	1-32
1.9.2.4 Tobar Archaeology	1-33
1.9.2.5 Alan Lipscombe Traffic and Transport Consultants	1-33
1.10 Difficulties Encountered.....	1-34
1.11 Viewing and purchasing the rEIA.....	1-34
2. BACKGROUND	2-1
2.1 Introduction	2-1
2.1.1 Historical Background of Peat Extraction.....	2-1
2.1.2 The Turf Development Board Ltd.....	2-4
2.1.3 The War Years and the Need for Indigenous Fuel	2-4
2.1.4 Establishment of BnM and the First Development Programme	2-4
2.1.4.1 The Second Development Programme	2-5
2.1.4.2 The Third Development Programme	2-6
2.1.4.3 After the Third Development Programme	2-6
2.1.5 Development at the Application Site	2-7
2.2 Application Site - Operational History.....	2-9
2.2.1 Site Planning History.....	2-10

2.1.1	Planning History of Peat Extraction at the Application Site.....	2-15
2.1.2	Integrated Pollution Control Licence (IPC) Licence (Ref. P0503-01)	2-18
2.3	Planning Policy Context	2-19
2.3.1	National Policy Context.....	2-19
2.3.1.1	Climate Change Strategies.....	2-19
2.3.1.2	National Planning Framework – First Revision	2-20
2.3.1.3	National Development Plan 2021-2030.....	2-21
2.3.1.4	National peatlands Strategy 2015-2025.....	2-22
2.3.1.5	Ireland’s 4 th National Biodiversity Action Plan 2023-2030.....	2-24
2.3.1.6	National Energy and Climate Plan 2021-2030.....	2-25
2.3.1.7	Ireland’s Transition to a Low Carbon Energy Future 2015 -2030 White Paper	2-25
2.3.1.8	RePEAT Project	2-25
2.3.1.9	Electricity Generating Infrastructure 2002 - 2019	2-26
2.3.2	Regional Policy Context	2-27
2.3.2.1	Regional Spatial and Economic Strategy for the Eastern and Midlands Region 2019-2031 2-27	
2.3.3	Local Policy Context.....	2-29
2.3.3.1	Offaly County Development Plan 2021 - 2027	2-29
2.3.3.2	Offaly County Development Plan 2014 - 2020	2-30
2.3.3.3	Offaly County Development Plan 2009-2015	2-31
2.3.3.4	Offaly County Development Plan 2003-2009	2-32
2.3.3.5	Offaly County Development Plan 1995.....	2-32
2.3.3.6	Offaly County Development Plan 1987	2-33
2.3.3.7	Offaly County Development Plan 1967	2-33
2.3.3.8	Kildare County Development Plan 2023-2029	2-34
2.3.3.9	Kildare County Development Plan 2017-2023	2-35
2.3.3.10	Kildare County Development Plan 2011-2017	2-36
2.3.3.11	Kildare County Development Plan 2005-2011	2-37
2.3.3.12	Kildare County Development Plan 1999-2005	2-38
2.3.3.13	Kildare County Development Plan 1985-1991	2-40
2.3.3.14	Kildare County Development Plan 1984 (Draft).....	2-41
2.3.3.15	Kildare County Development Plan 1977-1984	2-41
2.3.3.16	Kildare County Development Plan 1972-1977	2-42
2.3.3.17	Kildare County Development Plan 1967-1972	2-42
2.3.4	BnM Policy Context.....	2-43
2.3.4.1	Brown to Green Strategy 2018	2-43
2.3.4.2	BnM’s Sustainability 2030 Strategy and Biodiversity Action Plan 2016 - 2021.....	2-44
2.3.4.3	BnM Landbank Future Uses.....	2-44
2.3.5	Planning Policy Conclusions.....	2-45
2.4	Cumulative Impact Assessment	2-45
2.4.1	Methodology for the Cumulative Assessment of Projects	2-46
2.4.2	Projects Considered in the Cumulative Impact Assessment	2-46
2.4.2.1	Planning Applications & Permissions.....	2-46
2.4.2.2	EPA Licenced Activities	2-47
2.4.2.3	Arterial Drainage Schemes	2-47
2.4.2.4	Licenced Forestry	2-48
2.4.2.5	Peatland Climate Action Scheme.....	2-48
2.4.2.6	Proposed Ballydermot Wind Farm	2-48
2.4.2.7	Eastern and Midlands Region Water Supply Project	2-49
2.4.3	Summary	2-49
2.5	Scoping and Consultation.....	2-49
2.5.1	Scoping.....	2-49
2.5.2	Scoping Responses	2-50
2.5.3	Pre-Planning Consultation.....	2-56

3.	CONSIDERATION OF ALTERNATIVES.....	3-1
3.1	Introduction	3-1
3.2	Methodology.....	3-1
3.2.1	Temporal Range.....	3-2
3.2.2	Statement of Authority.....	3-2
3.3	Consideration of Alternatives	3-3
3.3.1	‘Do-Nothing’ Scenario.....	3-3
3.3.2	Alternative Locations	3-4
3.3.3	Alternative Industries	3-5
3.3.4	Alternative Layouts	3-9
3.3.5	Alternative Processes.....	3-9
3.3.6	Alternative Control Measures.....	3-11
3.3.7	Alternative to Rehabilitation Plans.....	3-12
3.4	Conclusion	3-13
4.	PROJECT DESCRIPTION	4-1
4.1	Introduction	4-1
4.1.1	Statement of Authority.....	4-2
4.1.2	Project Description Information Sources	4-3
4.1.3	Information Required for the Description of the Project.....	4-4
4.2	Project Description	4-6
4.2.1	Project Phases	4-6
4.2.2	General Overview of the Peat Extraction Process	4-7
4.2.2.1	Surveying and Drainage	4-7
4.2.2.2	Peat Extraction Process	4-15
4.2.2.3	Peat Extraction Machinery	4-25
4.2.2.4	Sod Moss Machinery	4-45
4.2.2.5	Bin Sod.....	4-46
4.2.3	Ancillary Structures and Infrastructure	4-47
4.2.3.1	Workshops	4-48
4.2.3.2	Works Offices	4-48
4.2.3.3	Welfare Facilities	4-49
4.2.3.4	Fuel Storage	4-49
4.2.3.5	Machine Storage Sheds.....	4-49
4.2.3.6	Storage Containers	4-49
4.2.3.7	Local Holding Areas	4-49
4.2.3.8	Tipheads	4-50
4.2.3.9	Vehicular Bridges	4-54
4.2.3.10	Railway Infrastructure	4-54
4.2.4	Site Services	4-60
4.3	1935 to 1988 – Initial Development & Peat Extraction (Pre-EIA Directive).....	4-61
4.3.1	Site Description 1935 (Pre-Extraction)	4-61
4.3.2	Drainage and Peat Extraction.....	4-61
4.3.3	Peat Extraction Pre-1988	4-65
4.3.3.1	Background.....	4-65
4.3.3.2	Milled Peat Extraction 1935 to 1988	4-65
4.3.3.3	Sod Peat Extraction 1950 to 1988.....	4-66
4.3.3.4	Sod Moss Extraction 1976 to 1988	4-66
4.3.4	Drainage Design.....	4-66
4.3.5	Peat Extraction Volumes 1935 – June 1988.....	4-69
4.3.6	Control Measures pre-July 1988	4-71
4.3.6.1	Peat Extraction Machinery – Maintenance Programmes and Storage	4-72
4.3.6.2	Refuelling Facilities	4-72

4.3.6.3	Fire Safety	472
4.3.6.4	Dust Management at Bog boundaries and Headlands	473
4.3.6.5	Internal Rail Network Maintenance	473
4.3.6.6	Surface Water Management	473
4.3.6.7	Maintenance Programme for Internal Drains.....	474
4.3.6.8	Maintenance of Onsite Surface Water Pumps	474
4.3.6.9	Silt Management.....	474
4.3.6.10	Waste Management.....	476
4.3.6.11	Archaeological Disturbance	477
4.4	July 1988 – rEIAR Baseline	477
4.4.1	Application Site and Activity Description – 1988 rEIAR Baseline	478
4.4.1.1	Ballydermot North Bog.....	480
4.4.1.2	Ballydermot South Bog.....	480
4.4.1.3	Blackriver Bog	480
4.4.1.4	Lullybeg Bog.....	480
4.4.1.5	Lullymore Bog.....	480
4.4.1.6	Lodge Bog.....	481
4.4.1.7	Killina Bog	481
4.4.1.8	Barnaran Bog.....	481
4.4.1.9	Derrybrennan Bog.....	481
4.4.1.10	Glashabaun North Bog	481
4.4.1.11	Glashabaun South Bog	482
4.4.1.12	Ticknevin Bog.....	482
4.4.1.13	Codd 1 Bog.....	482
4.4.1.14	Codd 2 Bog.....	482
4.4.2	1988 Peat Extraction Activities	482
4.5	Peat Extraction Phase July 1988 – June 2020 (Drainage, Peat Extraction & Associated Activities)	483
4.5.1	Drainage Systems 1988 - June 2020.....	483
4.5.1.1	Ballydermot North Bog.....	484
4.5.1.2	Ballydermot South Bog.....	484
4.5.1.3	Blackriver Bog	484
4.5.1.4	Lullybeg Bog.....	484
4.5.1.5	Lullymore Bog.....	484
4.5.1.6	Lodge Bog.....	485
4.5.1.7	Killina Bog	485
4.5.1.8	Barnaran Bog.....	485
4.5.1.9	Derrybrennan Bog.....	485
4.5.1.10	Glashabaun North Bog	485
4.5.1.11	Glashabaun South Bog	485
4.5.1.12	Ticknevin Bog.....	485
4.5.1.13	Codd 1 Bog.....	486
4.5.1.14	Codd 2 Bog.....	486
4.5.2	Silt Ponds	486
4.6	Peat Extraction and Ancillary Activities	487
4.6.1	Peat Extraction Volumes July 1988 to June 2020.....	491
4.6.2	Third- Party Peat Extraction Activities.....	493
4.6.3	Ancillary Activities July 1988 to June 2020.....	494
4.6.4	Not-Peat Related Activities	495
4.6.4.1	Commercial Forestry Activities	495
4.6.4.2	Lullymore Heritage and Discovery Park	495
4.6.4.3	Wind Monitoring Mast	495
4.6.5	Control Measures July 1988 to June 2000.....	496
4.6.5.1	Archaeological Code of Practice	496
4.7	Control Measures 2000 to Present Day (Post-IPC Licence)	497

4.7.1	Environmental Monitoring and Conditions under IPC Licence	4-97
4.7.1.1	Standard Operation Procedures	4-99
4.8	Current Phase (June 2020 to Present Day)	4-99
4.8.1	Decommissioning Process	4-99
4.8.2	Peatland Rehabilitation Plans	4-101
4.9	Remedial Phase	4-104
4.9.1	Peatland Rehabilitation Plans	4-104
4.9.2	Description of Proposed Rehabilitation Measures	4-115
4.9.2.1	Drain Blocking	4-115
4.9.2.2	Outfall and Pipe Modification	4-115
4.9.2.3	Monitoring	4-115
4.10	Potential Future Land Use	4-116
4.10.1	Proposed Ballydermot Wind Farm	4-116
4.10.2	Eastern and Midlands Region Water Supply Project	4-117
5.	POPULATION & HUMAN HEALTH	5-1
5.1	Introduction	5-1
5.1.1	Background & Objectives	5-1
5.1.2	Statement of Authority	5-2
5.2	Methodology	5-2
5.2.1	Relevant Guidelines	5-4
5.2.2	Scoping and Consultation	5-7
5.2.3	Assumptions and Limitations	5-8
5.3	Establishing the Baseline (July 1988)	5-8
5.3.1	Landcover and Land use	5-8
5.3.2	Baseline Population	5-9
5.3.3	Employment and Economic Activity	5-12
5.3.4	Education	5-13
5.3.5	Access and Transport	5-13
5.3.6	Property and Receptors	5-15
5.3.7	Amenities and Community Facilities	5-16
5.3.8	Human Health	5-16
5.4	Population Data	5-20
5.4.1	Demographic	5-22
5.4.2	Employment and Economic Activity	5-23
5.4.3	Services	5-27
5.4.4	Education	5-27
5.4.5	Access and Transport	5-27
5.4.6	Amenities and Community Facilities	5-27
5.5	Human Health	5-28
5.5.1	Air Quality	5-31
5.5.2	Water Quality	5-32
5.5.3	Noise	5-33
5.5.4	Health & Safety	5-34
5.5.5	Vulnerability of the Project to Major Accidents and Natural Disasters	5-35
5.6	Likely Significant Effects and Associated Control and Mitigation Measures	5-39
5.6.1	Do-Nothing Scenario	5-39
5.6.2	Peat Extraction Phase (July 1988 - June 2020)	5-40
5.6.3	Current Phase (June 2020 to Present Day)	5-50
5.6.4	Remedial Phase	5-58
5.6.5	Classification Summary	5-64
5.7	Cumulative and In-Combination Effects	5-66
5.7.1	Peat Extraction Phase: July 1988 - June 2020	5-66
5.7.2	Current Phase (June 2020 – Present Day)	5-67

5.7.3	Remedial Phase	5-68
5.7.4	Overall Cumulative Impact Assessment	5-68
5.8	Conclusion	5-69

6. BIODIVERSITY (INCLUDING ORNITHOLOGY)..... 6-1

6.1	Introduction	6-1
6.1.2	Statement of Authority	6-5
6.1.3	Requirements for Ecological Impact Assessment	6-6
6.1.4	Assessment Methodology and Relevant Guidance	6-8
6.2	Methodology	6-8
6.2.1	Desk Study	6-9
6.2.2	Scoping and Consultation	6-10
6.2.3	Field Surveys	6-12
6.2.4	Methodology for Assessment of Impacts and Effects	6-22
6.3	Establishing the Ecological Baseline	6-25
6.3.1	Desk Study	6-25
6.3.2	Ecological Walkover Survey Results: 2020-2025	6-70
6.3.3	Identification of Key Ecological Receptors (KERs)	6-116
6.4	Ecological Impact Assessment	6-124
6.4.1	'Do-Nothing' Effect	6-124
6.4.2	Likely Significant Effects	6-125
6.5	Residual Effects	6-144
6.5.1	Peat Extraction Phase: July 1988 – June 2020	6-144
6.5.2	Current Phase: June 2020 to present day	6-145
6.5.3	Remedial Phase	6-146
6.6	Significance of Effects	6-147
6.6.1	Peat Extraction Phase: July 1988 – June 2020	6-147
6.6.2	Current Phase: June 2020 to present day	6-148
6.6.3	Remedial Phase	6-149
6.7	Summary	6-150
6.8	Cumulative and In Combination Effects	6-152
6.8.1	Assessment of Plans	6-152
6.8.2	Projects	6-181
6.8.3	Assessment of Cumulative Effects	6-181
6.8.4	Other Land Uses	6-183
6.8.5	Cumulative Assessment Conclusion	6-184
6.8.6	Summary	6-185
6.9	Conclusion	6-187

7. LAND SOILS AND GEOLOGY 7-1

7.1	Introduction	7-1
7.1.1	Background and Objectives	7-1
7.1.2	Statement of Authority	7-1
7.1.3	Scoping and Consultation	7-2
7.1.4	Relevant Legislation	7-3
7.1.5	Relevant Guidance	7-4
7.2	Methodology	7-4
7.2.1	Desk Study	7-4
7.2.2	Monitoring and Site Investigation Data	7-5
7.2.3	Impact Assessment Methodology	7-6
7.2.4	Study Area	7-8
7.2.5	Limitations and Difficulties Encountered	7-8
7.3	Establishing the Baseline Environment	7-9

7.3.1	Site Location and Description	7-9
7.3.2	Topography	7-9
7.3.3	Land (Land take)	7-11
7.3.4	Peat/Soils and Subsoils	7-16
7.3.5	Bedrock Geology	7-30
7.3.6	Soil Contamination	7-34
7.3.7	Economic Geology	7-34
7.3.8	Geological Heritage Sites	7-35
7.3.9	Designated Sites	7-36
7.3.10	Peat Stability	7-38
7.4	Characteristics of the Project	7-39
7.4.1	Peat Extraction Phase (July 1988 – June 2020)	7-39
7.4.2	Current Phase (June 2020 – Present Day)	7-39
7.4.3	Remedial Phase	7-40
7.5	Assessment of Significant Effects and Control/Mitigation Measures	7-41
7.5.1	‘Do-Nothing’ Scenario	7-41
7.5.2	Identification of Impacts	7-42
7.5.3	Residual Effect	7-54
7.5.4	Significance of Effects	7-57
7.5.5	Summary	7-58
7.5.6	Cumulative and In-Combination Effects	7-60
8.	HYDROLOGY AND HYDROGEOLOGY	8-1
8.1	Introduction	8-1
8.1.1	Background and Objectives	8-1
8.1.2	Statement of Authority	8-1
8.1.3	Scoping and Consultation	8-2
8.1.4	Relevant Legislation	8-7
8.1.5	Relevant Guidance	8-7
8.2	Methodology	8-8
8.2.1	Desk Study	8-8
8.2.2	Monitoring and Site Investigation Data	8-9
8.2.3	Impact Assessment Methodology	8-10
8.2.4	Overview of Impact Assessment Process	8-12
8.2.5	Study Area	8-12
8.2.6	Limitations and Difficulties Encountered	8-12
8.3	Site Land Use History Summary	8-12
8.3.1	Site Location	8-12
8.3.2	Site Topography	8-13
8.3.3	Historic Land Use Changes	8-13
8.3.4	Existing Site Description and Topography	8-14
8.4	Establishing the 1988 Baseline Environment	8-14
8.4.1	Water Balance	8-14
8.4.2	Regional and Local Hydrology	8-16
8.4.3	Surface Water Flows	8-21
8.4.4	Site Drainage	8-22
8.4.5	Flood Risk Assessment	8-34
8.4.6	Surface Water Quality	8-35
8.4.7	Hydrogeology	8-50
8.4.8	Groundwater Vulnerability	8-53
8.4.9	Karst Features	8-53
8.4.10	Groundwater Hydrochemistry	8-56
8.4.11	Water Framework Directive Water Body Status & Objectives	8-56
8.4.12	Groundwater Body Status	8-57

8.4.13	Surface Water Body Status	8-57
8.4.14	Designated Sites and Habitats	8-60
8.4.15	Water Resources.....	63
8.4.16	Receptor Sensitivity.....	8-66
8.5	Characteristics of the Project	8-67
8.5.1	Peat Extraction Phase (July 1988 – June 2020)	8-67
8.6	Assessment of Significant Effects and Control/Mitigation Measures.....	8-68
8.6.1	Do -Nothing Scenario.....	8-68
8.6.2	Identification of Impacts	8-69
8.6.3	Residual Effects	8-92
8.6.4	Significance of Effects.....	8-97
8.6.5	Summary	8-100
8.6.6	Cumulative/In Combination Effects	8-102
8.6.7	Human Health.....	8-112
8.6.8	Monitoring	8-112
8.6.9	Major Accidents and Disasters (MADs)	8-112
8.6.10	Conclusions.....	8-113

9. AIR QUALITY 9-1

9.1	Introduction	9-1
9.1.1	Background & Objectives	9-1
9.1.2	Statement of Authority.....	9-1
9.1.3	Project Description	9-1
9.2	Methodology.....	9-2
9.2.1	EPA Description of Effects	9-2
9.2.2	Assessment Criteria	9-3
9.2.3	Scoping and Consultation.....	9-5
9.2.4	Study Area	9-6
9.2.5	Assessment Methodology	9-8
9.2.6	Difficulties Encountered.....	9-9
9.3	Establishment of Baseline (July 1988)	9-9
9.3.1	Review of EPA Air Quality Monitoring Data	9-10
9.3.2	Dust Deposition Monitoring	9-13
9.3.3	Sensitive Receptors.....	9-16
9.4	Likely Significant Effects and Associated Mitigation Measures	9-18
9.4.1	‘Do-Nothing’ Scenario.....	9-18
9.4.2	Peat Extraction Phase (July 1988 - June 2020)	9-19
9.4.3	Current Phase (June 2020 – Present Day).....	9-20
9.4.4	Remedial Phase	9-21
9.5	Control and Monitoring Measures.....	9-22
9.5.1	Peat Extraction Phase (July 1988 – June 2020)	9-22
9.5.2	Current Phase (June 2020 – Present Day).....	9-23
9.5.3	Remedial Phase	9-23
9.6	Residual Effects	9-23
9.6.1	Peat Extraction Phase (July 1988 - June 2020)	9-23
9.6.2	Current Phase (June 2020 – Present Day).....	9-24
9.6.3	Remedial Phase	9-24
9.7	Significance of Effects.....	9-24
9.7.1	Peat Extraction Phase (July 1988 - June 2020)	9-24
9.7.2	Current Phase (June 2020 – Present Day).....	9-24
9.7.3	Remedial Phase	9-24
9.7.4	Summary	9-24
9.8	Cumulative and In-Combination Effects	9-25
9.9	Conclusion	9-26

10. CLIMATE.....	10-1
10.1 Introduction	10-1
10.1.1 Background & Objectives	10-1
10.1.2 Statement of Authority	10-1
10.1.3 Project Description	10-1
10.1.3.1 Peat Extraction Phase: July 1988-June 2020	10-1
10.1.3.2 Current Phase: June 2020 to present day	10-2
10.1.3.3 Remedial Phase	10-2
10.2 Methodology.....	10-2
10.2.1 EPA Description of Effects	10-2
10.2.2 Assessment Criteria	10-2
10.2.2.1 Relevant Climate Guidelines, Policies and Legislation.....	10-2
10.2.2.2 Carbon and Peatlands.....	10-8
10.2.3 Scoping & Consultation	10-9
10.2.4 Study Area	10-9
10.2.5 Desktop Review.....	10-9
10.2.6 Assessment Methodology	10-10
10.2.6.1 GHG Emissions from Peat Extraction	10-10
10.2.6.2 CO ₂ Reductions from Peatland Rehabilitation	10-12
10.2.6.3 GHG Emissions from Traffic.....	10-12
10.2.7 Difficulties Encountered.....	10-15
10.3 Establishment of Baseline (July 1988)	10-15
10.3.1 Greenhouse Gas Emissions and Climate Baseline	10-15
10.3.2 Meteorological Data	10-18
10.4 Likely significant Effects and Associated Mitigation Measures	10-22
10.4.1 Do-Nothing Scenario.....	10-22
10.4.2 Peat Extraction Phase (July 1988 - June 2020)	10-22
10.4.3 Current Phase	10-23
10.4.4 Remedial Phase	10-25
10.5 Control and Monitoring Measures.....	10-26
10.5.1 Peat Extraction Phase (July 1988 – June 2020)	10-26
10.5.2 Current Phase (June 2020 – Present Day).....	10-26
10.5.3 Remedial Phase	10-26
10.6 Residual Effects	10-26
10.6.1 Peat Extraction Phase (July 1988 - June 2020)	10-26
10.6.2 Current Phase (June 2020 – Present Day).....	10-26
10.6.3 Remedial Phase	10-26
10.7 Significance of Effects.....	10-27
10.7.1 Peat Extraction Phase (July 1988 - June 2020)	10-27
10.7.2 Current Phase (June 2020 – Present Day).....	10-27
10.7.3 Remedial Phase	10-27
10.7.4 Summary.....	10-27
10.8 Cumulative and In-Combination Effects	10-28
10.9 Conclusion	10-29
10.10 References.....	10-31
 11. NOISE AND VIBRATION.....	 11-1
11.1 Introduction	11-1
11.1.1 Background & Objectives.....	11-1
11.1.2 Statement of Authority	11-1
11.1.3 Scoping and Consultation	11-2
11.2 Fundamentals of Acoustics	11-2
11.3 Assessment Methodology	11-4
11.3.1 EPA Description of Effects	11-4

11.3.2	Guidance Documents and Assessment Criteria.....	11-4
11.4	Background Noise Assessment.....	11-6
11.4.1	Choice of Measurement Locations	11-6
11.4.2	Measurement Periods	11-7
11.4.3	Personnel and Instrumentation	11-8
11.4.4	Procedure	11-8
11.4.5	Noise Calculations	11-9
11.5	Project Description	11-10
11.5.1	Peat Extraction Phase (July 1988 – June 2020).....	11-10
11.5.2	Current Phase (June 2020 – Present Day)	11-12
11.5.3	Remedial Phase.....	11-12
11.6	Likely Significant Effects and Associated Mitigation Measures	11-13
11.6.1	‘Do-Nothing’ Scenario	11-13
11.6.2	Identification and Description of Potential Impacts.....	11-14
11.6.3	Residual Effects	11-21
11.6.4	Significance of Effects	11-22
11.7	Summary	11-22
11.8	Cumulative and In-Combination Effects	11-23
11.9	Conclusion	11-26
12.	LANDSCAPE AND VISUAL	12-1
12.1	Introduction	12-1
12.1.1	Statement of Authority.....	12-2
12.1.2	Application Site Description	12-3
12.1.2.1	The Baseline Assessment Year (1988)	12-6
12.1.2.2	Peat Extraction Phase (July 1988 – June 2020)	12-7
12.1.2.3	Essential Aspects of Landscape & Visual Change during the Peat Extraction Phase.....	12-9
12.1.2.4	Current Phase (June 2020 – Present Day).....	12-10
12.1.2.5	Remedial Phase	12-10
12.1.2.6	Potential Future Use – Proposed Ballydermot Wind Farm	12-10
12.2	Methodology & Assessment Criteria.....	12-11
12.2.1	Guidance and Reference Materials.....	12-11
12.2.2	Methods for Establishing the Landscape Baseline & Landscape Evolution	12-12
12.2.3	Methods for Assessing Landscape & Visual Effects	12-12
12.2.3.1	Assessing Landscape Effects	12-12
12.2.3.2	Assessing Visual Effects	12-14
12.2.3.3	Determination of Residual Landscape and Visual Effects.....	12-17
12.3	Landscape Baseline & Landscape Evolution	12-19
12.3.1	Pre-1988 Landscape Character (1935-1987)	12-19
12.3.2	1988 Landscape Baseline – Landscape Character	12-21
12.3.3	Landscape Evolution – Landscape Character of the Application Site During the Peat Extraction Phase (July 1988 –June 2020)	12-23
12.3.4	Landscape Character of the Application Site - Current Phase (June 2020 – Present Day) 12-25	
12.3.5	Landscape Policy Context – Designated Landscape Character Areas, Scenic Routes and Views.....	12-32
12.3.5.1	Offaly County Development Plans	12-32
12.3.5.2	Kildare County Development Plans	12-39
12.3.6	Overview of Landscape Characterisation & Landscape Policy.....	12-46
12.4	Visibility Appraisal.....	12-46
12.4.1	Views to and from the Application Site.....	12-47
12.4.2	Visibility from Designated Scenic Amenity	12-56
12.4.3	Potential Changes in Visual Amenity – Peat Extraction Phase to Current Phase.....	12-56
12.5	Assessment of Significant Landscape and Visual Effects.....	12-57

12.5.1	'Do-Nothing' Scenario	12-57
12.5.2	Peat Extraction Phase – Landscape and Visual Effects	12-58
12.5.3	Current Phase – Landscape and Visual Effects	12-61
12.5.4	Remedial Phase – Likely Landscape and Visual Effects	12-61
12.5.5	Summary	12-62
12.6	Cumulative Landscape and Visual Assessment	12-63
12.6.1	Extraction Activity: 1935-1987 and Cumulative Interaction with the Peat Extraction Phase (1988-2020)	12-63
12.6.2	Peat Extraction Phase: Cumulative Interactions in the wider landscape (Post-1988)....	12-64
12.6.3	Current Phase: Cumulative Interactions	12-66
12.6.4	Remedial Phase: Cumulative Interactions with other Planned Developments	12-66
12.6.4.1	Proposed Ballydermot Wind Farm	12-66
12.7	Conclusion	12-67

13 ARCHAEOLOGY AND CULTURAL HERITAGE..... 13-5

13.1	Introduction	13-5
13.1.1	Statement of Authority	13-5
13.1.1.1	Limitations	13-5
13.1.2	Location	13-5
13.1.3	Legislation and Guidance	13-8
13.1.3.1	Current Legislation	13-8
13.1.3.2	National Policy	13-10
13.1.3.3	Relevant Guidance	13-10
13.1.4	County Development Plans	13-11
13.1.5	Scoping & Consultation	13-11
13.1.6	Project Description	13-12
13.2	Methodology.....	13-12
13.2.1	Geographical Information Systems	13-12
13.2.2	Desktop Assessment.....	13-13
13.2.2.1	Record of Monuments & Places, Sites & Monuments Record and National Monuments	13-13
13.2.2.2	Cartographic Sources and Aerial Photography.....	13-13
13.2.2.3	Topographical Files - National Museum of Ireland	13-13
13.2.2.4	Archaeological Inventory Series.....	13-14
13.2.2.5	Record of Protected Structures.....	13-14
13.2.2.6	Excavations Database.....	13-14
13.2.2.7	National Inventory of Architectural Heritage (NIAH).....	13-14
13.2.2.8	Previous Surveys and Assessments	13-15
13.2.3	Field Inspection	13-15
13.2.3.1	Limitations Associated with Fieldwork	13-16
13.2.4	Assessment of Likely Significant Effects.....	13-17
13.2.4.1	Types of Effect.....	13-17
13.2.4.2	Magnitude of Effects (Significance).....	13-17
13.2.5	Methodology for the assessment of effects on visual setting (indirect effects)	13-18
13.3	Establishing the 1988 Baseline.....	13-18
13.3.1	Ballydermot North Bog.....	13-19
13.3.2	Ballydermot South Bog.....	13-19
13.3.3	Blackriver Bog	13-19
13.3.4	Lullybeg Bog.....	13-19
13.3.5	Lullymore Bog.....	13-19
13.3.6	Lodge Bog.....	13-20
13.3.7	Killina Bog	13-20
13.3.8	Barnaran Bog.....	13-20
13.3.9	Derrybrennan Bog.....	13-20

13.3.10	Glashabaun North Bog	13-20
13.3.11	Glashabaun South Bog	13-21
13.3.12	Ticknevin Bog.....	13-21
13.3.13	Codd 1 Bog.....	13-21
13.3.14	Codd 2 Bog.....	13-21
13.3.15	Current Environment	13-21
13.4	Archaeological Heritage of the Application Site	13-22
13.4.1	Recorded Monuments within the Application Site boundary	13-22
13.4.1.1	Roads - Class 1 toghers	13-23
13.4.1.2	Road – Gravel/stone trackways	13-24
13.4.1.3	Structures - Peatland.....	13-25
13.4.1.4	Platform – Peatland	13-25
13.4.2	Archaeological Investigations	13-32
13.4.2.1	Previous Archaeological Surveys	13-32
13.4.2.2	Archaeological Excavation	13-33
13.4.3	Potential Subsurface Archaeology.....	13-34
13.4.4	Topographical Files – National Museum of Ireland	13-35
13.4.5	Townlands and Administrative Boundaries	13-37
13.4.6	Cartographic Evidence and Items of Local Cultural Heritage Merit.....	13-39
13.4.6.1	Down Survey Barony Maps.....	13-39
13.4.6.2	1 st and 2 nd Edition OS maps.....	13-40
13.4.7	Architectural Heritage.....	13-54
13.4.7.1	Protected Structures & the National Inventory of Architectural Heritage	13-54
13.5	Likely Significant Effects and Associated Control/Mitigation Measures.....	13-54
13.5.1	“Do Nothing” Scenario	13-54
13.5.2	Peat Extraction Phase: 1988-June 2020	13-55
13.5.2.1	Effect of Peat Extraction Phase – Indirect Effects on visual setting.....	13-55
13.5.2.2	Effect of Peat Extraction Phase– Direct Effects	13-55
13.5.2.3	Effect of Peat Extraction Phase on RMP/SMRs.....	13-56
13.5.2.4	Effect of Peat Extraction Phase on Archaeological Objects	13-58
13.5.2.5	Effect of Peat Extraction Phase on unrecorded potential sub-surface sites.....	13-58
13.5.2.6	Effect of Peat Extraction Phase on the Record of Protected Structures and NIAH	13-59
13.5.2.7	Impact of Peat Extraction Phase on Local Cultural Heritage.....	13-59
13.5.3	Current Phase: June 2020 to present day.....	13-60
13.5.3.2	Cumulative & In Combination Effects	13-60
13.5.4	Remedial Phase	13-61
13.5.4.1	Effect of Remedial Phase	13-61
13.5.4.2	Cumulative & In Combination Effects.....	13-61
13.6	Residual Effect.....	13-62
13.6.1	Peat Extraction Phase: 1988-June 2020	13-62
13.6.2	Current Phase June 2020 to present day.....	13-62
13.6.3	Remedial Phase	13-62
13.7	Significance of Effects.....	13-62
13.7.1	Peat Extraction Phase: 1988-2020	13-63
13.7.2	Current Phase: June 2020 to present day.....	13-63
13.7.3	Remedial Phase	13-63
13.7.4	Summary.....	13-63
13.8	Cumulative and In Combination Effects	13-64
13.9	Conclusion	13-66

14. MATERIAL ASSETS	14-3
14.1.1 Statement of Authority	14-3
14.1.2 Assumptions and Limitations	14-4
14.2 Traffic and Transport	14-6
14.2.1 Introduction	14-6
14.2.2 Methodology	14-7
14.2.3 Establishment of Baseline (July 1988)	14-8
14.2.4 Traffic and Rail Movements/Interactions	14-11
14.2.5 Assessment of significant Effects and Mitigation Measures	14-33
14.3 Cumulative and In-Combination Effects	14-39
14.4 Other Material Assets	14-41
14.4.1 Introduction	14-41
14.4.2 Methodology	14-43
14.4.3 Establishment of Baseline (July 1988)	14-43
14.4.4 Peat Extraction Phase: July 1988 to June 2020	14-46
14.4.5 Current Phase: June 2020 to present day	14-49
14.4.6 Remedial Phase	14-50
14.4.7 Assessment of Significant Effects and Mitigation Measures	14-51
14.4.8 Cumulative and In-Combination Effects	14-68
14.5 Conclusion	14-72
 15. VULNERABILITY TO MAJOR ACCIDENTS AND NATURAL DISASTERS	 15-1
15.1 Introduction	15-1
15.1.1 Statement of Authority	15-1
15.1.2 Difficulties Encountered	15-2
15.2 Assessment Methodology	15-2
15.2.1 General	15-2
15.2.2 Legislative Context	15-2
15.2.2.1 Legislation	15-2
15.2.2.2 Guidance Documents	15-3
15.2.3 Categorisation of the Baseline Environment	15-4
15.2.4 Impact Assessment Methodology	15-4
15.2.4.1 Introduction	15-4
15.2.4.2 Site-Specific Risk Assessment Methodology	15-4
15.3 Establishing The Baseline Conditions (July 1988)	15-9
15.3.1 Flooding	15-10
15.3.2 Telecommunications, Aircraft and Collision/Loss	15-10
15.3.3 Water Contamination	15-10
15.3.4 Fire	15-11
15.3.5 Major Road Traffic Accident	15-11
15.3.6 Natural Gas Explosion	15-12
15.4 Peat Extraction Phase (July 1988 – June 2020)	15-12
15.4.1 Flooding	15-12
15.4.2 Telecommunications, Aircraft and Collision/Loss	15-13
15.4.3 Water Contamination	15-13
15.4.4 Fire	15-14
15.4.5 Major Road Traffic Accident	15-15
15.4.6 Natural Gas Explosion	15-16
15.5 Current Phase (June 2020 – Present Day)	15-16
15.5.1 Flooding	15-16
15.5.2 Telecommunications, Aircraft and Collision/Loss	15-17
15.5.3 Water Contamination	15-17
15.5.4 Fire	15-18
15.5.5 Major Road Traffic Accident	15-18

15.5.6	Natural Gas Explosion	15-18
15.6	Remedial Phase	15-18
15.6.1	Flooding	15-18
15.6.2	Telecommunications, Aircraft and Collision/Loss	15-19
15.6.3	Water Contamination	15-19
15.6.4	Fire	15-19
15.6.5	Major Road Traffic Accident	15-20
15.6.6	Natural Gas Explosion	15-20
15.7	General Health and Safety	15-20
15.8	Risk Assessment	15-21
15.8.1	Likely Significant Effects and Mitigation Measures	15-22
15.8.1.1	‘Do-Nothing’ Scenario	15-22
15.8.1.2	Peat Extraction Phase (July 1988 to June 2020)	15-23
15.8.1.3	Current Phase (June 2020 to Present Day)	15-25
15.8.1.4	Remedial Phase	15-26
15.8.2	Risk Assessment Summary	15-28
15.8.2.1	Assessment of Effect – Summary	15-29
15.8.3	Mitigation Measures	15-46
15.8.3.1	Peat Bog Fires	15-46
15.8.3.2	Contamination	15-47
15.8.3.3	Flooding	15-47
15.9	Residual Effects	15-47
15.9.1	Peat Extraction Phase (July 1988 – June 2020)	15-47
15.9.2	Current Phase (June 2020 – Present Day)	15-48
15.9.3	Remedial Phase	15-48
15.9.4	Summary	15-48
15.10	Assessment of Cumulative Effects and In Combination Impacts	15-49
15.10.1	Peat Extraction Phase (1988 to 2020)	15-49
15.10.2	Current Phase (2020 to Present Day)	15-49
15.10.3	Remedial Phase	15-50
15.11	Conclusion	15-51
16.	INTERACTION OF THE FOREGOING	16-1
16.1	Introduction	16-1
16.1.1	Statement of Authority	16-5
16.2	Impact Interactions	16-5
16.2.1	Population and Human Health	16-5
16.2.2	Biodiversity	16-11
16.2.3	Land, Soils and Geology	16-15
16.2.4	Material Assets	16-19
16.2.5	Vulnerability to Major Accidents and Natural Disasters	16-21
16.3	Control and Mitigation Measures	16-21
17.	SCHEDULE OF MITIGATION & MONITORING MEASURES	17-1
17.1	Introduction	17-1