

LIST OF PLATES AND FIGURES

Plate 1	Site Location
Plate 2	Supplier / Receiver Locations
Plate 3	Bio energy Process
Plate 7.1	Trial Pit 1
Plate 7.2	Trial Pit 2
Plate 7.3	Trial Pit 3
Plate 8.1	Field 1, facing north
Plate 8.2	Field 1, clearance cairn, facing northeast
Plate 8.3	Field 2, facing north
Plate 8.4	Field 2, slight rise in the ground (APP 1) facing northeast
Plate 8.5	Track way located within proposed development area, facing northwest
Figure 8.1	Site location
Figure 8.2	Extract from the RMP map
Figure 8.3	Proposed site layout
Figure 8.4	Area of proposed development showing nearby archaeological site
Figure 8.5	Extract from the first edition OS map (1842)
Figure 8.6	Extract from the third edition OS map (1914)
Figure 11.1	Site context
Figure 11.2	Topography map
Figure 11.3	Slope map
Figure 11.4	Existing vegetation map
Figure 11.5	Land use map
Figure 11.6	Visual analysis map

For inspection purposes only.
Consent of copyright owner required for any other use.

APPENDICES

- Appendix A** Westmeath County Development Plan 2008 – 2014, Renewable Energy
- Appendix B** **Air Dispersion Modelling Contour Plots**
- Site layout drawing and location of proposed facility and nearby residences
- Dispersion modelling contour plots for Scenarios 1 to 12 – Worst case meteorological year Clones 2004**
- Scenario 1 - Carbon monoxide
 - Scenario 2 and 3 - Oxides of nitrogen
 - Scenario 4, 5 and 6 - Sulphur dioxide
 - Scenario 7, 8, 9 and 10 - Total particulates
 - Scenario 11 – TNMVOC as Benzene
 - Scenario 12 – Odour
- Meteorological data used within the Dispersion modelling study.**
- Checklist for EPA requirements for air dispersion modelling reporting**
- Appendix C** **Receiver Locations**
- Noise Measurement Graphs**
- Predicted Worst Case Scenario (No Attenuation)**
- Calibration Certificates**
- Further Information Report October – December 2011**
- Appendix D** **RMP Sites within the surrounding area**
- Stray finds within the surrounding area**
- Legislative framework protection the archeological resource**
- Impact assessment and the cultural heritage resource**
- Mitigation measures and the cultural heritage resource**
- Appendix E** **Bedrock Faults 100k**
- National Draft Generalised Bedrock (DPUL)**
- Nation Draft Gravel Aquifer Map**
- Teagasc Subsoils (Peat)**
- Bedrock1:1 Million Solid Geology**
- Groundwater Well Data**
- Source Protection Area**
- Eastern Interim Vulnerability**
- National Draft Bedrock Aquifer map**
- Karst Features**
- Soils Map**
- Sub Soils Map**
- River Catchment**
- Hydrometric Area**
- River Basin District**
- Trial Pit Locations**
- Appendix F** **Traffic Generation Information**
- Junction Capacity**

**Traffic Flow Diagrams
Traffic Survey Information**

- Appendix G** **Base line views 01- 07
Proposed views 01 -07**
- Appendix H** **Letters of consent for temporary access road
Letters of intent suppliers
Letters of intent receivers**
- Appendix I** **Inter Relationship**
- Appendix J** **Planning Drawings – A4**

*For inspection purposes only.
Consent of copyright owner required for any other use.*

For inspection purposes only.
Consent of copyright owner required for any other use.

Appendix A

Westmeath County Development Plan 2008 – 2014
Renewable Energy

Appendix B

Air Dispersion Modelling Contour Plots

- Site layout drawing and location of proposed facility and nearby residences

Dispersion modelling contour plots for Scenarios 1 to 12 – Worst case meteorological year Clones 2004

- Scenario 1 - Carbon monoxide
- Scenario 2 and 3 - Oxides of nitrogen
- Scenario 4, 5 and 6 - Sulphur dioxide
- Scenario 7, 8, 9 and 10 - Total particulates
- Scenario 11 – TNMVOC as Benzene
- Scenario 12 – Odour

Meteorological data used within the Dispersion modelling study.

Checklist for EPA requirements for air dispersion modelling reporting

Consent of copyright owner required for any other use.
For inspection purposes only.

For inspection purposes only.
Consent of copyright owner required for any other use.

Appendix C

Receiver Locations
Noise Measurement Graphs
Predicted Worst Case Scenario (No Attenuation)
Calibration Certificates
Further Information Report October – December 2011

Consent of Copyright owner required for any other use.
For inspection purposes only.

Appendix D

RMP Sites within the surrounding area
Stray finds within the surrounding area
Legislative framework protection the archeological resource
Impact assessment and the cultural heritage resource
Mitigation measures and the cultural heritage resource

For inspection purposes only.
Consent of copyright owner required for any other use.

Appendix E

Bedrock Faults 100k
National Draft Generalised Bedrock (DPUL)
Nation Draft Gravel Aquifer Map
Teagasc Subsoils (Peat)
Bedrock1:1 Million Solid Geology
Groundwater Well Data
Source Protection Area
Eastern Interim Vulnerability
National Draft Bedrock Aquifer map
Karst Features
Soils Map
Sub Soils Map
River Catchment
Hydrometric Area
River Basin District
Trial Pit Locations

For inspection purposes only.
Consent of copyright owner required for any other use.

Appendix F

Traffic Generation Information
Junction Capacity
Traffic Flow Diagrams
Traffic Survey Information

For inspection purposes only.
Consent of copyright owner required for any other use.

Appendix G

Base line views 01- 07
Proposed views 01 -07

For inspection purposes only.
Consent of copyright owner required for any other use.

Appendix H

Letters of consent for temporary access road
Letters of intent suppliers
Letters of intent receivers

For inspection purposes only.
Consent of copyright owner required for any other use.

Appendix I

Inter Relationship – A4

For inspection purposes only.
Consent of copyright owner required for any other use.

Appendix J

Planning Drawings – A4

For inspection purposes only.
Consent of copyright owner required for any other use.

PLATES

Site Location
Supplier / Receiver Locations
Bio energy Process
Field 1, facing north
Field 1, clearance cairn, facing northeast
Field 2, facing north
Field 2, slight rise in the ground (APP 1) facing northeast
Track way located within proposed development area, facing northwest

For inspection purposes only.
Consent of copyright owner required for any other use.

FIGURES

Site location
Extract from the RMP map
Proposed site layout
Area of proposed development showing nearby archaeological site
Extract from the first edition OS map (1842)
Extract from the third edition OS map (1914)
Site context
Topography map
Slope map
Existing vegetation map
Land use map
Visual analysis map

GLOSSARY OF TERMS

Alternatives

A description of alternatives - as defined by the Regulations - alternative locations, alternative designs and alternative processes.

Anaerobic Digestion (AD)

Is a natural process of decomposition and decay that takes place in the absence of oxygen and by which organic matter is broken down to its simpler chemical components.

Archaeology

The study of past societies of any period through the material remains left by those societies and the evidence of their environment. The material things (objects, monuments, sites, features, deposits) which archaeology uses to study past societies are referred to as 'archaeological heritage'.

Baseline Survey

A description of the existing environment against which future changes can be measured.

Commissioning

The rendering fully operational of a project or process.

Decommissioning

The final closing down, and putting into a state of safety of a development, project or process when it has come to the end of its useful life.

"Do nothing" Scenario

The situation or environment which would exist if no intervention or development were carried out.

Ecology

The study of the relationships between living organisms and between organisms and their environment (especially animal and plant communities), their energy flows and their interactions with their surroundings.

Environmental Impact Statement – EIS

A statement of the effects, if any, which the proposed development, if carried out, would have on the environment.

Emission

- a) an emission into the atmosphere of a pollutant within the meaning of the Air Pollution Act 1987.
- b) a discharge of polluting matter, sewage effluent or trade effluent within the meaning of the Local Government (Water Pollution) Act 1977 to waters or sewers within the meaning of that Act.
- c) disposal of waste,
- d) noise.

EPA

The Environmental Protection Agency.

Geology

The science of the earth, including the composition, structure and origin of its rocks.

Ground Water

The water which flows underground through naturally porous parts of the soil or rock.

Habitat

The area in which an organism or group of organisms live.

Hydrology

The science concerned with the occurrence and circulation of water in all its phases and modes, and the relationship of these to man.

Impact

The degree of change in an environment resulting from a development.

Infrastructure

The basic structure, framework or system which supports the operation of a development project for example, installations such as roads and sewers which are necessary to support development projects.

Land-use

The activities which take place within a given area of space.

Methodology

The specific approach or techniques used to analyse impacts or describe environments.

Mitigation

Measures designed to avoid, reduce, remedy or compensate for impacts. Mitigation By Remedy:

Impact Avoidance: When no change is caused.

Impact Reduction: Where the significance of adverse impacts is lessened.

Impact Remedy: When an adverse effect is replaced with a more acceptable effect.

Mitigation Measures

The means by which decisions about a proposed development are modified to avoid, reduce or remedy the adverse environmental effects that are identified.

Monitoring

The repetitive and continued observation, measurement and evaluation of environmental data to follow changes over a period of time, to assess the efficiency of control measures.

Pests

Insects, both flying and crawling.

Physical barrier

Device used to prevent entry of pests and vermin such as insect

Processes

The activities which take place within a development.

Risk Assessment

An analytical study of the probabilities and magnitude of harm to human health or the environment associated with a physical or chemical agent, activity or occurrence.

Scoping

The process of identifying the significant issues which should be addressed by a particular Environmental Impact Assessment.

Significance

The sensitivity of a receiving environment to change or the consequence of change for the receiving environment.

SOP

Standard Operating Procedure

Surface Water

Natural water bodies such as streams, lakes and rivers.

Sustainable Development

Defined by the Brundtland Commission 1987 "Development that meets the needs of the present without comprising the ability of the future generation to meet their own needs".

Vermin

All rodents. Animals excluded from the establishment. Wild birds

For inspection purposes only.
Consent of copyright owner required for any other use

REFERENCES

- Al Sedi, T, Rutz, D, Prassl, H, Kottner, M, Finsterwalder, T, Volk, S, Janssen, R. 2008. *Biogas Handbook*
- An Fóras Taluntais, 1980. *General Soil Map of Ireland 2nd Edition, The National Soil Survey*,
- Bayley, D. 2011 forthcoming *Report on Archaeological Testing in advance of the N4 Downs Grade Separation Scheme, Co. Westmeath (11E020)*. Unpublished report prepared by Irish Archaeological Consultancy Ltd for Westmeath County Council.
- Bennett, I. (ed.) 1970-2007. *Excavation Bulletin*. Bray.
- Brindley, A. L. *et al.* 1989–90 Radiocarbon dates from Irish *fulachta fiadh* and other burnt mounds. *Journal of Irish Archaeology* 5, 25–33.
- Corlett, C. 1997 A *fulacht fiadh* site at Moynagh Lough, County Meath. *Ríocht na Míde* 9 (3), 46–49.
- County Westmeath Development Plan 2008-2014.
- Culleton, E 1999 *Celtic and Early Christian Wexford* Four Courts Press: Dublin
- Dennehy, E. 2002 *Archaeological Excavation Report, N4 The Downs Realignment, Co. Westmeath (Licence 00E0076, 00E0091, 00E0092, 00E0093, 00E0094, 00E0095, 00E0097)*. Unpublished report prepared by Eachtra Archaeological Projects on behalf of Westmeath County Council.
- Department of Arts, Heritage, Gaeltacht and the Islands. 1999a. *Framework and Principles for the Protection of the Archaeological Heritage*. Dublin: Government Publications Office.
- Department of Arts, Heritage, Gaeltacht and the Islands. 1999b. *Policy and Guidelines on Archaeological Excavation*. Dublin: Government Publications Office.
- Environmental Protection Agency. 2003. *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)*. Dublin: Government Publications Office.
- Environmental Protection Agency. 2003. *Guidelines on the Information to be Contained in Environmental Impact Statements*. Dublin: Dublin: Government Publications Office.
- Fossitt, J.A. 2000 *A guide to habitats in Ireland*. Heritage Council.
- Environmental Protection Agency, 2008. *Hitting the Targets for Biodegradable Municipal Waste: Ten Options for Change*
- Environmental Protection Agency, 2006. *Bioenergy – Opportunities for agriculture, industry, and waste management, Discussion Paper*

Environmental Protection Agency, 2009. *Municipal Solid Waste – Pre treatment & Residuals Management*

Environmental Protection Agency, 2005. *Anaerobic Digestion: Benefits for Waste Management, Agriculture, Energy, and the Environment – Discussion Paper*

Environmental Protection Agency, 2009, *National Waste Report 2009*

Environmental Protection Agency, *Water Quality in Ireland 1990-1994* (EPA);

Environmental Protection Agency *Water Quality in Ireland 1995-1997* (EPA);

Environmental Protection Agency *Water Quality in Ireland 1998-2000* (EPA);

Geological Survey of Ireland, *Aquifer classification and vulnerability identification from the (GSI web page)*

Geological Survey of Ireland, *Reports, maps and data published by the Geological Survey of Ireland (GSI) and the National Soil Survey of Ireland.*

Harbison, P. 1992. *Guide to the National and Historic Monuments of Ireland*. Dublin: Gill and Macmillan.

Institute of Field Archaeologists. 2001a. *Standards and Guidance for Archaeological Desk-based Assessments*. Manchester: IFA.

JNCC (Joint Nature Conservation Committee) 1990 *Handbook for Phase I habitat survey - a technique for environmental audit*. Peterborough.

McErlean, T. 1983 'The Irish Townland System of Landscape Organisation' In Reeves-Smyth, T. & Hammond, F. (Eds), *Landscape Archaeology in Ireland*, 319-339 (Oxford)

Moore, C. 2007 Right on track at Edercloon. *Seanda*.

National Monument Section, Department of Environment, Heritage and Local Government. *Sites and Monuments Record, County Westmeath*.

National Roads Authority. 2006. *Guidelines for the Assessment of Archaeological Impact of National Road Schemes*.

National Roads Authority, 2007. *Traffic and Transport Assessment Guidelines*

Nicholls, J. 2008a *Geophysical Survey Report: Area 1 - WM027-001 The Downs Grade Separation, Co. Westmeath (Report 08/015)*. Unpublished report prepared by Target Archaeological Geophysics.

Nicholls, J. 2008b *Geophysical Survey Report: Area 2 - WM027-004 The Downs Grade Separation, Co. Westmeath (Report 08/020)*. Unpublished report prepared by Target Archaeological Geophysics.

Nicholls, J. 2008c *Geophysical Survey Report: Area 3- Potential fulacht fiadh, The Downs Grade Separation, Co. Westmeath (Report 08/021)*. Unpublished report prepared by Target Archaeological Geophysics.

O'Neill, N. 2008a *Report on an archaeological test excavation of Area 3 at The Downs, Newdown, in the parish of Killucan and Barony of Farbill in Co. Westmeath under excavation license 08E0325*. Draft unpublished report prepared by Headland Archaeology Ltd.

O'Neill, N. 2008b *Report on an archaeological test excavation of RMP WM027-001 at The Downs, Newdown, in the parish of Killucan and Barony of Farbill in Co. Westmeath under excavation license 08E0326*. Draft unpublished report prepared by Headland Archaeology Ltd.

O'Neill, N. 2008c *Report on an archaeological test excavation of RMP WM027-004 at The Downs, Newdown, in the parish of Killucan and Barony of Farbill in Co. Westmeath under excavation license 08E0324*. Draft unpublished report prepared by Headland Archaeology Ltd.

Preston, C.D., Pearman D.A. & Dines T.D. 2002. *New atlas of the British and Irish flora*. Oxford University Press.

Rynne, C. 2006 *Industrial Ireland 1750-1930: An archaeology*. Cork. Collins Press Cork.

Stout, M. 2000 *The Irish Ringfort*. Dublin.

Cartographic Sources

Sir William Petty, 1685, *The County of Westmeath*

Ordnance Survey 6" maps of County Cavan (1838, 1878 1914)

Electronic Sources

www.excavations.ie – Summary of archaeological excavation from 1970-2007

www.archaeology.ie – DoEHLG website listing all SMR sites with aerial photographs

www.googleearth.com – Aerial photographs of the proposed development area

www.osi.ie – Ordnance Survey aerial photographs (1995, 2000 & 2005) and historic OS mapping (first edition 6" and 25")

Joyce, P.W. 1870. *Irish Local Names Explained*.

www.booksulster.com/library/plnm/placenamesC.php

Egan, O. 2003. Newdown, 03E0805. *Excavations.ie database of Irish excavation reports*, 2003:1999.

<http://www.excavations.ie/Pages/Details.php?Year=&County=Westmeath&id=10827>

Hayes, A. 2003. Newdown, 03E1666. *Excavations.ie database of Irish excavation reports*, 2003:2000.

<http://www.excavations.ie/Pages/Details.php?Year=&County=Westmeath&id=10828>

Kiely, J. 1999. Newdown, 99E0359. *Excavations.ie database of Irish excavation reports*, 1999:873.

<http://www.excavations.ie/Pages/Details.php?Year=&County=Westmeath&id=872>

For inspection purposes only.
Consent of copyright owner required for any other use.