

Ms Grainne Oglesby,
Administration Officer,
Office of Climate, Licencing & Resource Use,
Environmental Protection Agency,
Headquarters PO Box 3000,
Johnstown Castle Estate.
County Wexford.

21st August 2017.

Re: Application for Licence Reg No: W0211-02

Dear Ms Oglesby,

I refer the Agency's letter dated 2nd June in accordance with Regulation 10(2)(b)(ii) of the EPA (Industrial Emissions) (Licensing) Regulations 2013 under Regulation 9 of the Regulations. The outstanding information is set out herein.

Appropriate Assessment

9. *Your response to point 39 is not to the satisfaction of the Agency. Provide a revised Natural Impact Statement (NIS). The revised MS should consider the implications and impact of discharges from the installation without the AquaCritox process on the adjacent SAC and SPA.*

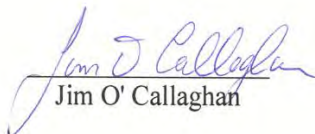
The revised NIS is in Attachment 1.

Baseline Report

11. *Please provide a revised Baseline Report that reflects the results obtained from the chemical analysis of the soil samples.*

The revised Baseline Report is in Attachment 2.

Yours Sincerely



Jim O' Callaghan

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

ATTACHMENT 1

*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.

Dixon.Brosnan

environmental consultants

Project			
Natura Impact Statement for the construction of an Anaerobic Digestion (AD) Plant and associated Combined Heat and Power (CHP) plant to an existing waste recovery/transfer and sludge drying facility at Foxhole, Youghal, Co. Cork.			
Client		ERAS ECO Limited	
Project ref	Report no	Client ref	
1764	1764		
DixonBrosnan The Cedars, Bridewood, Ovens, Co Cork Tel 086 851 1437 carl@dixonbrosnan.com www.dixonbrosnan.com			
Date	Rev	Status	Prepared by
18/8/17	0	Issued to client	Carl Dixon MSc.
			Ian McDermott MSc.
This report and its contents are copyright of DixonBrosnan. It may not be reproduced without permission. The report is to be used only for its intended purpose. The report is confidential to the client, and is personal and non-assignable. No liability is admitted to third parties. ©DixonBrosnan 2016.			
v180907			

1. Introduction

The information compiled in this report has been prepared by DixonBrosnan Environmental Consultants, on behalf of the applicant, ERAS-ECO Ltd. It provides information on and assesses the potential for the proposed development at Foxhole, Youghal, Co. Cork, to impact on any Natura 2000 sites within its zone of influence. The information in this report forms part of, and should be read in conjunction with the planning application documentation being submitted to Cork County Council in connection with the proposed development.

In accordance with section 177U of the Planning and Development Act, the proposed development is subject to an Appropriate Assessment and therefore a Natura Impact Statement must be submitted in accordance with section 177T of the Act. Accordingly, this Natura Impact Statement for Appropriate Assessment comprises a compilation of the information relevant to the competent authority's assessments relating to the potential significant impacts of the proposed development on Natura 2000 sites within the surrounding area.

2. Regulatory Context and the Appropriate Assessment Procedure

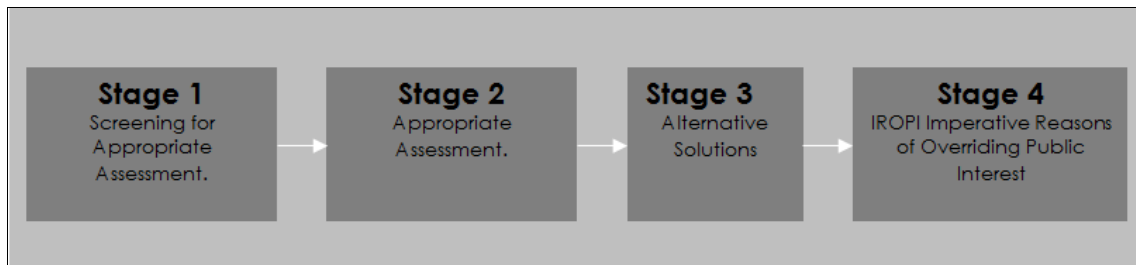
2.1 Regulatory context

Article 6(3) of *Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora* (as amended) (hereafter 'the Habitats Directive') requires that, any plan or project not directly connected with or necessary to the management of a designated site, but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.

The possibility of there being a significant effect on a designated or "European" site has generated the need for an appropriate assessment to be carried out by the competent authority for the purposes of Article 6(3). A Stage Two Appropriate Assessment is required if it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site. The first (Screening) Stage for appropriate assessment operates merely to determine whether a (Stage Two) Appropriate Assessment must be undertaken on the implications of the plan or project for the conservation objectives of relevant European sites.

2.2 Appropriate Assessment Procedure

The assessment requirements of Article 6(3) establish a stage-by-stage approach. This assessment follows the stages outlined in the 2001 European Commission publications "Assessment of plans and projects significantly affecting Natura 2000 sites: methodological guidance on the provisions of Articles 6(3) and 6(4) of the Habitats Directive 92/43/EEC" (2001) and *Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (Draft)* Office for Official Publications of the European Communities, Luxembourg (EC, 2015);



The stages are as follows:

Stage One: Screening — the process which identifies any appreciable impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant;

Stage Two: Appropriate assessment — the consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts;

Stage Three: Assessment of alternative solutions: The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site. It is confirmed that no reliance is placed by the developer on Stage Three in the context of this application for development consent;

Stage Four: Assessment where no alternative solutions exist and where adverse impacts remain — an assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed (it is important to note that this guidance does not deal with the assessment of imperative reasons of overriding public interest). Again, for the avoidance of doubt, it is confirmed that no reliance is placed by the developer on Stage Four in the context of this application for development consent

Documentation/guidelines of relevance to this NIS include the following:

- European Commission, 2001. *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC*. Office for Official Publications of the European Communities, Brussels (EC, 2001);
- European Commission, 2000a. *Communication from the Commission on the Precautionary Principle.*, Office for Official Publications of the European Communities, Luxembourg (EC, 2000a);
- *Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (Draft)* Office for Official Publications of the European Communities, Luxembourg (EC, 2015);
- *Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2000)*
- 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; (EC, 2007);

- *Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities.* Department of the Environment, Heritage and Local Government, Dublin (DEHLG, 2010a);
- Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities (DEHLG, 2010b);
- *Interpretation Manual of European Union Habitats. Version EUR 28.* European Commission (EC, 2013);
- Applications for approval for Local Authority Developments made to An Bord Pleanála under 177AE of the Planning and Development Act, 2000, as amended (Appropriate Assessment): Guidelines for Local Authorities. An Bord Pleanála, Dublin (ABP, 2013).

It is necessary that the proposal has regard to Article 6 of the European Commission Habitats Directive (EC/92/43) as transposed in Ireland by the European Communities (Natural Habitats) Regulations, 1997 (as amended); herein after referred to as the Habitats Regulations. Regulations 27 and 33 of the Habitats Regulations, provided below, are of particular relevance.

Regulation 27

1. A local authority when duly considering an application for planning permission, or the Board when duly considering an appeal on an application for planning permission, in respect of a proposed development that is not directly connected with, or necessary to the management of, a European site but likely to have a significant effect thereon either individually or in combination with other developments, shall ensure that an appropriate assessment of the implications for the site in view of the site's conservation objectives is undertaken.
2. An environmental impact assessment in respect of a proposed development prepared in accordance with a requirement of or under the Local Government (Planning and Development) Regulations, 1994 (S.I. No. 86 of 1994), shall be an appropriate assessment for the purposes of paragraph (1).
3. Notwithstanding section 26 of the Local Government (Planning and Development) Act, 1963, and subject to paragraphs (4), (5) and (6) a local authority or the Board, as the case may be, shall, having regard to the conclusions of the assessment to which paragraph (1) relates, decide to grant permission for the proposed development only after having ascertained that it will not adversely affect the integrity of the European site concerned.
4. In considering whether a development will adversely affect the integrity of the European site concerned, the local authority or the Board, as the case may be, shall have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the permission should be given.
5. A local authority or the Board, as the case may be, may, notwithstanding a negative assessment and in the absence of alternative solutions, decide to grant planning

permission for a proposed development where such development has to be carried out for imperative reasons of overriding public interest.

6. (A) Subject to subparagraph (b), imperative reasons of overriding public interest shall include reasons of a social or economic nature:

(B) If the site concerned hosts a priority natural habitat type or priority species the only considerations of overriding public interest shall be — (i) those relating to human health or public safety, or (ii) the beneficial consequences of primary importance for the environment, or (iii) further to an opinion from the Commission to other imperative reasons of overriding public interest.

7. Where a local authority or the Board desire to obtain the opinion of the Commission as to whether reasons are to be considered imperative reasons of overriding public interest, they shall refer the matter to the Minister for the Environment and the Minister for the Environment shall communicate with the Commission on behalf of the local authority or the Board and by notice shall convey the Commission's opinion to the local authority or the Board, as the case may be.
8. A decision shall not be made on the application or the appeal, as the case may be, by the local authority or the Board until the Commission's opinion has been communicated to them.
9. For the purposes of the Board's objectives under subsection (2) of section 2 of the Local Government (Planning and Development) Act, 1992, to determine the appeal within a period of 4 months or such other period as may be prescribed under paragraph (b) of that subsection, there shall not be included the period beginning on the day the matter is referred by the Board to the Minister for the Environment under that paragraph and ending on the day of receipt by the Board of notice by the Minister for the Environment of an opinion by the Commission on the matter.
10. Notwithstanding subsection (4) of section 26 of the Local Government (Planning and Development) Act, 1963, the appropriate period referred to in that subsection shall not, in a case in which a request is made to the Minister for the Environment under paragraph (7), include the period beginning on the day the matter is referred by the local authority to the Minister for the Environment under that paragraph and ending on the day of receipt by the local authority concerned of notice by the Minister for the Environment of an opinion by the Commission on the matter.
11. Where immediately before the making of these Regulations a planning authority or the Board, as the case may be, have granted permission in respect of a development within a European site and such development is considered by the Minister to have a significant adverse effect on the ecological features of the site that Minister may request the local authority or the Board to review the permission in accordance with the provisions of this Regulation and the local authority or the Board shall affirm, modify or revoke such permission depending on the results of the review.

Regulation 33:

Where in accordance with Regulations 27 (5), 28 (5), 29 (4), 30 (5), 31 (5) or 32 (5) an operation or activity is agreed to, notwithstanding a negative assessment of the implications for a European site, the Minister shall ensure that the necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected.

It is the responsibility of the competent authority, in this instance Cork County Council, to make a decision as to whether or not the proposed development should be approved, taking into consideration any potential impact upon any Natura 2000 site within its zone of influence.

3. Methodology

3.1 Study Area and Scope of Appraisal

The proposed development is not directly connected with, or necessary for, the management of any Natura 2000 site. No habitat loss will occur within any Natura 2000 site as a result of this proposed development.

Natura 2000 sites (European sites) are only at risk from significant effects where a source-pathway-receptor link exists between a proposed development and a Natura 2000 site(s). This can take the form of a direct impact (e.g. where the proposed development and/or associated construction works are located within the boundary of the Natura 2000 site(s) or an indirect impact where impacts outside of the Natura 2000 site(s) affect ecological receptors within (e.g. impacts to water quality which can affect riparian habitats at a distance from the impact source).

Considering the Natura 2000 sites present in the region, their Qualifying Interests (QIs) and conservation objectives, and any potential impact pathways that could link those sites to the proposed development area, a distance of 15km was considered appropriate to encompass all Natura 2000 sites potentially within the Zone of Influence (ZoI) of the proposed development.

Thus, any appreciable direct, indirect or cumulative impacts which could arise from the proposed development in relation to the designated sites within this zone were considered.

A Screening Report conducted by Scott Cawley Ltd in 2010 concluded that;

“in accordance with the precautionary principle it would not be possible to rule out likely significant impacts upon the Blackwater River cSAC and Blackwater Estuary SPA. This decision was arrived at primarily as a result of the following potentially significant impacts:

- *Discharge of treated wastewater (from the waste treatment processes) into the Blackwater Estuary; and*
- *Run-off of sediment and / or pollutants into the Blackwater Estuary during both construction and operation of the proposed development.*
- *Noise that may arise during the construction and operation of the proposed development”*

“Applying the precautionary principle, it was determined that due to the range of potentially significant impacts upon Natura 2000 sites, it was not possible to rule out significant impacts

upon the sites; and therefore the assessment proceeded directly to Stage Two: Appropriate Assessment."

The zone of influence of the proposed development extends beyond the boundaries of the proposed development site primarily due to the proximity of the Blackwater estuary. No potential ecological risks to designated sites outside this 15km radius were identified.

3.2 Desktop Study

A desktop review facilitates the identification of the baseline ecological conditions and key ecological issues relating to Natura 2000 sites and facilitates an evaluation assessment of potential in-combination impacts. Sources of information used for this NIS include previous reports prepared for the site, information from statutory and non-statutory bodies and information from other projects in the area. The sources of information and relevant documentation utilised are as follows:

- National Parks & Wildlife Service (NPWS) - www.npws.ie including qualifying interests and conservation objectives for Natura 2000 sites.
- Environmental Protection Agency (EPA) – www.epa.ie
- National Biodiversity Data Centre – www.biodiversityireland.ie
- Natura Impact Statement; Provision of information for an appropriate assessment of adaptations to an existing ERAS-ECO waste recovery/transfer and sludge drying facility at Foxhole, Youghal, Co. Cork. (Scott Cawley Ltd, 2010).
- Environmental Impact Assessment of adaptations to the existing (ERAS-ECO Ltd Waste Treatment and Transfer Facility, 2010); including an Ecological Impact Assessment (Scott Cawley Ltd, 2010).
- ERAS ECO Ltd. Existing and Proposed Activities. Pre-planning Submission by Tom Phillips & Associates.
- Environmental Liability Risk Assessment (O' Callaghan Moran & Associates 2017)
- Environmental Impact Assessment of the Youghal Waste Treatment and Transfer Facility, (SWS Environmental Services, 2004)
- Water Quality Study in Youghal Harbour. A report for SWS Energy Service by Aquafact International Services Ltd (2005)
- Model Study of Youghal Harbour. A report for SWS Energy Service by Aquafact International Services Ltd (2008)
- Status of EU Protected Habitats in Ireland. (National Parks & Wildlife Service, 2008)
- South Western River Basin Management Plan 2009-2015
- Youghal Development Plan 2009-2015. Including Vol III: Strategic Environmental Assessment and Vol IV: Appropriate Assessment. Youghal Town Council.

3.3 Author of Report

This NIS was prepared by Carl Dixon MSc. (Ecological Monitoring) He has considerable experience in ecological assessment and the preparation of Natura Impact Statements for a range of large and small scale developments.

4. Description of the project

ERAS ECO Ltd (ERAS ECO) is Cork's leading sludge management company and has been operating its facility at Foxhole, Youghal since 2007. The facility operates under an Industrial

Emissions Licence (W0211-01) issued by the Environmental Protection Agency (Agency) and treats sewage sludge from local authority sewerage treatment plants and non-hazardous sludge's from industrial waste water treatment plants operating mainly in the Cork area. The current Licence authorises the acceptance of 110,000 tonnes of waste per year. ERAS ECO has applied to the Agency for a review of the Licence to allow the construction of an Anaerobic Digestion (AD) Plant and associated Combined Heat and Power (CHP) plant, and to increase the amount of waste that can be biologically treated. The overall authorised waste acceptance tonnage will decrease from 110,000 tonnes to 65,000 tonnes/year. An overview of the proposed development is included as **Appendix 1** of this report.

The installation occupies almost 1.6 hectares of polder land on the western bank of the Blackwater estuary and is approximately 2km from Youghal and adjacent to the former Youghal Landfill and to the Cork-Waterford border. The main channel of the Blackwater Estuary is located approximately 200m to the east of the site. The Tourig River joins the Blackwater Estuary to the north of the site, and an area of mudflat at the junction is located approximately 10m to the north of the site. Treated wastewater from the development is discharged into the estuary at this location.

The site contains a number of industrial buildings, administrative storage areas and other components including a wastewater treatment plant. The majority of the site is composed of buildings and artificial surfaces, with small areas of amenity grassland, flower beds and gravel. The boundary along the road frontage is composed of a high stone wall and security gates. Other boundaries are marked by a chain-link fence and a line of trees.

Storm water from roofs and non-waste storage/standing areas is currently passed through two silt/ oil interceptors (Class 1) and collected in a storm water retention tank. It is then discharged into the Blackwater Estuary to the north of the site via a pH controlled non-return valve. Wastewater resulting from the sludge-drying and wash water from the wheel wash is treated in an on-site process waste water treatment plant (WWTP) comprising, pH adjustment, a balance tank, dissolved air floatation unit, carbon and sand filters, lamella settlement unit, hypochlorite treatment and a sludge storage tank. This in turn is discharged into the Blackwater Estuary via the Irish Water combined sewer. Domestic foul effluent i.e. sanitary wastewater, is initially treated by means of a Puraflo© system; a proprietary treatment system, before being discharged to the Irish Water combined sewer, that outfalls in the Blackwater Estuary. It is proposed to divert the discharge to the Irish Water WWTP when this is operational and it is understood that the design of the WWTP has taken this into consideration.

Odours from the sludge treatment process are controlled by an advanced odour control system, installed in 2007, which collects air, treats it in a series of scrubbers and filters and discharges through an emission point. This control system has proven to be effective. There is also an emission point associated with the sludge dryer boiler stack.

Odours from the building which is currently used for the storage of wood chip and low odour sludge and where lime stabilisation and MSW transfer had occurred are controlled by an odour control system comprising an air collection system and specially designed filter, which vents to atmosphere via a stack.

The proposed Anaerobic Digestion (AD) plant will comprise six liquid storage tanks, two pasteuriser tanks and a feed hopper and conveyor located in Building, and two digester tanks

and a digestate storage tank located in the south of the site. The digesters will be enclosed by an impermeable cover and heated to 37°C and will be continuously stirred and fed with sludges. This process will produce a biogas and a digestate.

The biogas will contain approximately 65 % methane, which will then be treated and either used as a fuel in the proposed Combined Heat and Power (CHP) plant or exported to the national gas grid. The digestate will be pasteurised to facilitate its use as a fertiliser.

The digestate has a significant nutrient and soil enhancement value and is typically applied to agricultural lands, either as whole digestate or as a separated fibre. While it is intended to continue the land application of the digestate, it is proposed to provide the capability to dewater the digestate in a new centrifuge that will be located in Building 1. The centrifuge will not be continuously operated but will be used at times when there is pressure on digestate storage capacity.

The centrifuge will produce a fibre (typically 20% dry solids) and a separated liquor. The fibre will be a semi-solid “cake” and will be stored in a trailer inside Building 1. When full the trailer will be sent to the land application banks. The fibre is also suitable for composting and this option will be used in the periods when land application is restricted.

The liquor will be recirculated in the AD process; however following the commissioning of new Irish Water wastewater treatment plant serving Youghal, approval will be sought to discharge some liquor to the Irish Water foul sewer.

4.1 Mitigation measures

The likely success of the proposed mitigation measures is high, either in their current form or as they will be adapted on-site to achieve the desired result. The mitigation measures have been drawn up in line with current best practice and include an avoidance of sensitive habitats at the design stage. It is clear in what the mitigation measures are designed to achieve in lowering or reducing the risk of impact to acceptable levels. Whilst the proposed methods of mitigation may be amended and supplemented the risk that the mitigation measures will not function effectively in preventing significant ecological impacts is low. The following mitigation measures will be implemented:

1. All personnel involved with the project will receive an on-site induction relating to operations and the environmentally sensitive nature of the proximity of the River Blackwater SAC and re-emphasise the precautions that are required as well as the mitigation to be implemented.
2. To prevent firewater run-off contamination of the Blackwater Estuary there are shut off valves on both the storm water and drain. The operational area contained by a combination of perimeter kerb and block wall. An Emergency Response Plan will be in place and staff trained in emergency response.
3. There is provision of separate surface water drainage system for areas of the site where there is the potential for contamination of the run-off to occur. Run-off from these areas passes through an oil interceptor before discharge to the Irish Water storm sewer.

4. To prevent seepage of liquid leaked to surface water and Blackwater Estuary due to rupture or damage to digesters and digestate storage tanks there is a shut off valve on the surface water drain. The operational area is contained by a combination of perimeter kerb and block wall.
5. All operational areas are paved with concrete and surrounded by a perimeter kerb. Routine inspection and repair of damaged paved areas. The tanks will be constructed in 2017. The tanks and pipework will be subject to regular inspection and integrity testing, which will identify any damage and facilitate quick repair. Tanks will be fitted with a blast release roof to minimise damage in the event of explosion.
6. The bund design and construction of diesel tanks complies with licence requirements and has more than 110% capacity of the tank. The bund is subject to regular visual inspection and routine integrity testing and repaired as required. Oil interceptor and shut off-valve on storm water system discharging at SW1. The ERP will ensure rapid response to any incident, including closing of shut off valves on storm water outlet
7. Site staff are fully trained in spill prevention and clean-up. The Emergency Response Plan will ensure rapid response to any pollution incidents.
8. Works will comply with The IFI's Guidelines on protection of fisheries during construction Works in and adjacent to waters (IFI, 2016).
9. The construction and management of the site will take account of the recommendations of the CIRIA guides Control of Water Pollution from Construction Sites 2001 and Control of water pollution from linear construction projects 2006 to minimise the risk of pollution.
10. All equipment and machinery will have regular checking for leakages and quality of performance. All site personnel will be trained and aware of the appropriate action in the event of an emergency, such as the spillage of potentially polluting substances.
11. Oil, petrol and other fuel containers will be double-skinned and banded to be able to contain 110% volume to guard against potential accidental spills or leakages. Spill kits are retained to ensure that all spillages or leakages are dealt with immediately and staff are trained in their proper use.
12. The existing on-site waste water treatment plant will continue to operate as part of the proposed development.
13. Wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at an appropriate facility offsite or at the location where concrete was sourced. All equipment must be in good condition to prevent impacts on water quality.
14. Works will be suspended during periods of extreme rainfall.

15. All site wastes (hazardous and non-hazardous), will be stored in designated areas and taken off site frequently to prevent large quantities accumulating. All wastes generated as part of the construction process will be controlled and managed to ensure environmental protection. Careful ordering of materials will be undertaken to minimise quantities present on-site.
16. To prevent Japanese Knotweed or other invasive species from outside the site being inadvertently being brought in to the site, the contractor will be required to inspect vehicles before using them on site.
17. Environmental noise arising from activities on the construction site shall be controlled in accordance with the requirements of BS 5228. All contractors will ensure that the plant and construction methods employed are the quietest available for the required purpose insofar as practicable. Engines, vehicles and equipment will be switched off when not in use. Significant sources of noise will be enclosed.
18. Works will primarily take place during hours of daylight to minimise disturbance to any roosting birds or feeding nocturnal mammal species.

5. Natura 2000 sites

5.1 Designated sites within a 15km radius



Natura 2000 sites within a 15km radius of the proposed development site are listed below in **Table 1**. It is noted that use of a 15km radius is a precautionary measure, as impacts at this distance from the proposed development are highly unlikely in the absence of significant aqueous emissions. The proposed development is not located within any Natura 2000 site, however a source-pathway-receptor link does exist between the source (ERAS ECO facility) and the receptor (Blackwater River (Cork/Waterford) SAC & Blackwater Estuary SPA) via an already established pathway (Discharge of treated surface water run-off and wastewater, noise and disturbance). It is noted that the proposed development site itself does not support any of the species or habitats listed as qualifying interests for the Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA. An ecological appraisal of the site indicates that it supports common habitats which are not of high value in the context of the Natura 2000 designation. A full site synopsis for the SAC and SPA are included below. Due to the distances involved and the lack of hydraulic or any other connections, the only designated sites considered relevant for the purposes of this report are the Blackwater River (Cork/Waterford) SAC & Blackwater Estuary SPA. The location of the ERAS ECO facility in relation to the Blackwater River (Cork/Waterford) SAC & Blackwater Estuary SPA is shown below in **Figure 1**.

Table 1. Designated sites and their location relative to the ERAS ECO facility.

Site	Code	Distance (source-pathway-receptor link)
Special Area of Conservation (SAC)		
Blackwater River (Cork/Waterford)	002170	Located outside boundary but source-pathway-receptor link.
Ballymacoda (Clonpriest And Pillmore)	000077	6.5km SW (No link)
Ardmore Head	002123	10.1km SE (No link)
Special Protection Area (SPA)		

Blackwater Estuary	004028	Located outside boundary but source-pathway-receptor link.
Ballymacoda Bay	004023	5.5km S (No link)
Helvick Head to Ballyquin	004192	11.6km E (No link)
Proposed Natural Heritage Area (pNHA)		
Blackwater River & Estuary	000072	Located outside boundary but source-pathway-receptor link.
Ballyvergan Marsh	000078	3.7km S (No link)
Ballyeelinan Wood	001692	11.5km E (No link)
Ballycotton, Ballynamona & Shanagarry	000076	14.5km SE (No link)
Clasharinka Pond	001183	13.6km SW (No link)
Ballyquirk Pond	001235	11.6km WSW (No link)



Figure 1 shows the approximate location of the existing facility (yellow shade) in relation to the Blackwater River (Cork/Waterford) SAC  & Blackwater Estuary SPA . Source: OSi map viewer and NPWS map viewer.

5.2 Blackwater River (Cork/Waterford) SAC site synopses

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which include the

Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The portions of the Blackwater and its tributaries that fall within this SAC flow through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Nearby towns include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

- [1130] Estuaries
- [1140] Tidal Mudflats and Sandflats
- [1220] Perennial Vegetation of Stony Banks
- [1310] Salicornia Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [3260] Floating River Vegetation
- [91A0] Old Oak Woodlands
- [91E0] Alluvial Forests*
- [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)
- [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*)
- [1106] Atlantic Salmon (*Salmo salar*)
- [1355] Otter (*Lutra lutra*)
- [1421] Killarney Fern (*Trichomanes speciosum*)

The Blackwater rises in boggy land in east Kerry, where Namurian grits and shales build the low heather-covered plateaux. Near Kanturk the plateaux enclose a basin of productive Coal Measures. On leaving the Namurian rocks the Blackwater turns eastwards along the northern slopes of the Boggeragh Mountains before entering the narrow limestone strike vale at Mallow. The valley deepens as first the Nagles Mountains and then the Knockmealdowns impinge upon it. Interesting geological features along this stretch of the Blackwater Valley include limestone cliffs and caves near the villages and small towns of Killavullen and Ballyhooly; the Killavullen caves contain fossil material from the end of the glacial period. The associated basic soils in this area support the growth of plant communities which are rare in Cork because in general the county's rocks are acidic. At Cappoquin the river suddenly turns south and cuts through high ridges of Old Red Sandstone. The Araglin valley is predominantly underlain by sandstone, with limestone occurring in the lower reaches near Fermoy.

Wet woodlands are found where river embankments have broken down and channel edges are subject to daily inundation. This is particularly evident in the steep-sided valley of the River Bride, between Cappoquin and Youghal. The river side of the embankments was often used for willow growing in the past (most recently at Cappoquin) so that the channel is lined by narrow woods of White and Almondleaved Willow (*Salix alba* and *S. triandra*), with isolated

Crack Willow (*S. fragilis*) and Osier (*S. viminalis*). Rusty Willow (*S. cinerea* subsp. *oleifolia*) spreads naturally into the sites and occasionally, as at Villierstown on the Blackwater and Sapperton on the Bride, forms woods with a distinctive mix of woodland and marsh plants, including Gypsywort (*Lycopus europaeus*), Guelder-rose (*Viburnum opulus*), Bittersweet (*Solanum dulcamara*) and various mosses and algae. These wet woodlands form one of the most extensive tracts of the wet woodland habitat in the country.

A small stand of Yew (*Taxus baccata*) woodland occurs within the site. This is on a limestone ridge at Dromana, near Villierstown. While there are some patches of the wood with a canopy of Yew and some very old trees, the quality is generally poor due to the dominance of non-native and invasive species such as Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*) and Douglas Fir (*Pseudotsuga menziesii*). However, it does have the potential to develop into a Yew dominated stand in the long term and the site should continue to be monitored.

Marshes and reedbeds cover most of the flat areas beside the rivers and often occur in mosaic with the wet woodland. Common Reed (*Phragmites australis*) is ubiquitous and is harvested for thatching. There is also much Marsh-marigold (*Caltha palustris*) and, at the edges of the reeds, the Greater and Lesser Pond-sedge (*Carex riparia* and *C. acutiformis*). Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Reed Canary-grass (*Phalaris arundinacea*), Meadowsweet (*Filipendula ulmaria*), Common Nettle (*Urtica dioica*), Purple Loosestrife (*Lythrum salicaria*), Common Valerian (*Valeriana officinalis*), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*) are all also found.

At Banteer there are a number of hollows in the sediments of the floodplain where subsidence and subterranean drainage have created isolated wetlands, sunk below the level of the surrounding fields. The water rises and falls in these holes depending on the water table and several different communities have developed on the acidic or neutral sediments. Many of the ponds are ringed with Rusty Willow, rooted in the mineral soils but sometimes collapsed into the water. Beneath the densest stands are woodland herbs like Yellow Pimpernel (*Lysimachia nemorum*), with locally abundant Common Water-starwort (*Callitriche stagnalis*) and Marsh Ragwort (*Senecio aquaticus*). One of the depressions has Silver Birch (*Betula pendula*), Ash (*Fraxinus excelsior*), Crab Apple (*Malus sylvestris*) and a little Pedunculate Oak (*Quercus robur*) in addition to the willows.

Floating river vegetation is found along much of the freshwater stretches within the site. The species list is quite extensive, with species such as water-crowfoots, including Pond Water-crowfoot (*Ranunculus peltatus*), Canadian Pondweed (*Elodea canadensis*), pondweed species, including Broad-leaved Pondweed (*Potamogeton natans*), water-milfoil species (*Myriophyllum* spp.), Common Club-rush (*Scirpus lacustris*), water-starwort species (*Callitriche* spp.), Lesser Water-parsnip (*Berula erecta*) particularly on the Awbeg, Water-cress (*Nasturtium officinale*), Hemlock Waterdropwort, Fine-leaved Water-dropwort (*O. aquatica*), Common Duckweed (*Lemna minor*), Yellow Water-lily (*Nuphar lutea*), Unbranched Bur-reed (*Sparganium emersum*) and the moss *Fontinalis antipyretica* all occurring.

The grasslands adjacent to the rivers of the site are generally heavily improved, although liable to flooding in many places. However, fields of more species-rich wet grassland with species such as Yellow Iris (*Iris pseudacorus*), Meadowsweet, Meadow Buttercup (*Ranunculus acris*) and rushes (*Juncus* spp.) occur occasionally. Extensive fields of wet grassland also occur at

Annagh Bog on the Awbeg. These fields are dominated by Tufted Hair-grass (*Deschampsia cespitosa*) and rushes.

The Blackwater Valley has a number of dry woodlands; these have mostly been managed by the estates in which they occur, frequently with the introduction of Beech and a few conifers, and sometimes of the invasive species *Rhododendron* (*Rhododendron ponticum*) and Cherry Laurel (*Prunus laurocerasus*). Oak woodland is well developed on sandstone about Ballinatray, with the acid oak woodland community of Holly (*Ilex aquifolium*), Bilberry (*Vaccinium myrtillus*), Great Wood-rush (*Luzula sylvatica*) and the ferns *Dryopteris affinis* and *D. aemula* occurring in one place. Irish Spurge (*Euphorbia hyberna*) continues eastwards on acid rocks from its headquarters to the west, but there are also many plants of richer soils, for example Wood Violet (*Viola reichenbachiana*), Goldilocks Buttercup (*Ranunculus auricomus*), Broad-leaved Helleborine (*Epipactis helleborine*) and Red Campion (*Silene dioica*). Oak woodland is also found in Rincrew, Carrigane, Glendine, Newport and Dromana. The spread of *Rhododendron* is locally a problem, as is over-grazing. A few limestone rocks stand over the river in places showing traces of a less acidic woodland type with Ash, False Brome (*Brachypodium sylvaticum*) and Early-purple Orchid (*Orchis mascula*).

In the vicinity of Lismore, two deep valleys cut in Old Red Sandstone join to form the Owenashad River before flowing into the Blackwater at Lismore. These valleys retain something close to their original cover of oak with Downy Birch (*Betula pubescens*), Holly and Hazel (*Corylus avellana*) also occurring. There has been much planting of Beech (as well as some of coniferous species) among the oak on the shallower slopes and here both *Rhododendron* and Cherry Laurel have invaded the woodland.

The oak wood community in the Lismore and Glenmore valleys is of the classic upland type, in which some Rowan (*Sorbus aucuparia*) and Downy Birch occur. Honeysuckle (*Lonicera periclymenum*) and Ivy (*Hedera helix*) cover many of the trees while Great Wood-rush, Bluebell (*Hyacinthoides non-scripta*), Wood-sorrel (*Oxalis acetosella*) and, locally, Bilberry dominate the ground flora. Ferns present on the site include Hard Fern (*Blechnum spicant*), Male Fern (*Dryopteris filix-mas*), the bucklerferns *D. dilatata* and *D. aemula*, and Lady Fern (*Athyrium filix-femina*). There are many mosses present and large species such as *Rhytidiadelphus* spp., *Polytrichum formosum*, *Mnium hornum* and *Dicranum* spp. are noticeable. The lichen flora is important and includes 'old forest' species which imply a continuity of woodland here since ancient times. Tree Lungwort (*Lobaria* spp.) is the most conspicuous and is widespread.

The Araglin valley consists predominantly of broadleaved woodland. Oak and Beech are joined by Hazel, Wild Cherry (*Prunus avium*) and Goat Willow (*Salix caprea*). The ground flora is relatively rich, with Pignut (*Conopodium majus*), Ramsons (*Allium ursinum*), Garlic Mustard (*Alliaria petiolata*) and Wild Strawberry (*Fragaria vesca*). The presence of Ivy Broomrape (*Orobanche hederaceae*), a local species within Ireland, suggests that the woodland, along with its attendant Ivy, is long established.

Along the lower reaches of the Awbeg River, the valley sides are generally cloaked with mixed deciduous woodland of estate origin. The dominant species is Beech, although a range of other species are also present, e.g. Sycamore, Ash and Horsechestnut (*Aesculus hippocastanum*).

In places the alien invasive species Cherry Laurel dominates the understorey. Parts of the woodlands are more semi-natural in composition, being dominated by Ash, with Hawthorn (*Crataegus monogyna*) and Spindle (*Euonymus europaea*) also present. However, the most natural areas of woodland appear to be the wet areas dominated by Alder and willows (*Salix* spp.). The ground flora of the dry woodland areas features species such as Pignut, Wood Avens (*Geum urbanum*), Ivy and Soft Shield-fern (*Polystichum setiferum*), while the ground flora of the wet woodland areas contains characteristic species such as Remote Sedge (*Carex remota*) and Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*). In places along the upper Bride, scrubby, semi-natural deciduous woodland of willow, oak and Rowan occurs, with abundant Great Wood-rush in the ground flora.

The Bunaglanna River passes down a very steep valley, flowing in a north-south direction to meet the Bride River. It flows through blanket bog to heath and then scattered woodland. The higher levels of moisture here enable a vigorous moss and fern community to flourish, along with a well-developed epiphyte community on the tree trunks and branches.

At Banteer a type of wetland occurs near the railway line which offers a complete contrast to the others. Old turf banks are colonised by Royal Fern (*Osmunda regalis*) and Eared Willow (*Salix aurita*), and between them there is a sheet of Bottle Sedge (*Carex rostrata*), Marsh Cinquefoil (*Potentilla palustris*), Bogbean (*Menyanthes trifoliata*), Marsh St. John's-wort (*Hypericum elodes*) and the mosses *Sphagnum auriculatum* and *Aulacomnium palustre*. The cover is a scraw (i.e. floating vegetation) with characteristic species like Marsh Willowherb (*Epilobium palustre*) and Early Marshorchid (*Dactylorhiza incarnata*).

The soil high up the Lismore valleys and in rocky places is poor in nutrients but it becomes richer where streams enter and also along the valley bottoms. In such sites Wood Speedwell (*Veronica montana*), Wood Anemone (*Anemone nemorosa*), Enchanter's-nightshade (*Circaea lutetiana*), Barren Strawberry (*Potentilla sterilis*) and shield-fern (*Polystichum* sp.) occur. There is some Ramsons, Three-nerved Sandwort (*Moehringia trinervia*) and Early-purple Orchid (*Orchis mascula*) locally, with Opposite-leaved Golden-saxifrage, Meadowsweet and Bugle (*Ajuga reptans*) in wet places. A stand of Hazel woodland at the base of the Glenakeeffe valley shows this community well.

The area has been subject to much tree felling in the recent past and re-sprouting stumps have given rise to areas of bushy Hazel, Holly, Rusty Willow and Downy Birch. The ground in the clearings is heathy with Heather (*Calluna vulgaris*), Slender St John's-wort (*Hypericum pulchrum*) and the occasional Broom (*Cytisus scoparius*) occurring.

The estuary and the habitats within and associated with it form a large component of the site. Very extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. The main expanses occur at the southern end of the site, with the best examples at Kinsalebeg in Co. Waterford, and between Youghal and the main bridge north of it across the river in Co. Cork. Other areas occur along the tributaries of the Licky in east Co. Waterford, and Glendine, Newport, Bride and Killahaly Rivers in Waterford west of the Blackwater. There are also large tracts along the Tourig River in Co. Cork. There are narrow bands of intertidal flats along the main river as far north as Camphire Island. Patches of green filamentous algae (*Ulva* sp. and *Enteromorpha* sp.) occur in places, while fucoid algae are common on the more stony flats, even as high upstream as Glenassy or Coneen.

The area of saltmarsh within the site is small. The best examples occur at the mouths of the tributaries and in the townlands of Foxhole and Blackbog. Those found are generally characteristic of Atlantic salt meadows. The species list at Foxhole consists of Common Saltmarsh-grass (*Puccinellia maritima*), small amounts of Greater Seaspurrey (*Spergularia media*), glasswort (*Salicornia* sp.), Sea Arrowgrass (*Triglochin maritima*), Annual Sea-blite (*Suaeda maritima*) and Sea Purslane (*Halimione portulacoides*) - the latter a very recent coloniser. Some Sea Aster (*Aster tripolium*) occurs, generally with Creeping Bent (*Agrostis stolonifera*). Sea Couch (*Elymus pycnanthus*) and small isolated clumps of Sea Club-rush (*Scirpus maritimus*) are also seen. On the Tourig River additional saltmarsh species found include sea-lavenders (*Limonium* spp.), Thrift (*Armeria maritima*), Red Fescue (*Festuca rubra*), Common Scurvygrass (*Cochlearia officinalis*) and Sea Plantain (*Plantago maritima*). Oraches (*Atriplex* spp.) are found on channel edges. Species such as Saltmarsh Rush (*Juncus gerardi*) and Sea Rush (*J. maritimus*) are found in places in this site also, and are indicative of Mediterranean salt meadows. Areas of *Salicornia* mud are found at the eastern side of the townland of Foxhole above Youghal, at Blackbog, along the Tourig and Kinsalebeg estuaries.

The shingle spit at Ferrypoint supports a good example of perennial vegetation of stony banks. The spit is composed of small stones and cobbles and has a well-developed and diverse flora. At the lowest part, Sea Beet (*Beta vulgaris* subsp. *maritima*), Curled Dock (*Rumex crispus*) and Yellow Horned-poppy (*Glaucium flavum*) occur, while at a slightly higher level Sea Mayweed (*Matricaria maritima*), Cleavers (*Galium aparine*), Rock Samphire (*Crithmum maritimum*), Sea Sandwort (*Honkenya peploides*), Spear-leaved Orache (*Atriplex prostrata*) and Babington's Orache (*A. glabriuscula*). Other species present include Sea Rocket (*Cakile maritima*), Herb-Robert (*Geranium robertianum*), Red Fescue and Kidney Vetch (*Anthyllis vulneraria*). The top of the spit is more vegetated and supports lichens and bryophytes, including *Tortula ruraliformis* and *Rhytidiadelphus squarrosus*.

The site supports several Red Data Book plant species, i.e. Starved Wood-sedge (*Carex depauperata*), Killarney Fern (*Trichomanes speciosum*), Pennyroyal (*Mentha pulegium*), Bird's-nest Orchid (*Neottia nidus-avis*), Golden Dock (*Rumex maritimus*) and Bird Cherry (*Prunus padus*). The first three of these are also protected under the Flora (Protection) Order, 2015, while the Killarney Fern is also listed on Annex II of the E.U. Habitats Directive. The following plants, relatively rare nationally, are also found within the site: Toothwort (*Lathraea squamaria*) - associated with woodlands on the Awbeg and Blackwater; Summer Snowflake (*Leucojum aestivum*) and Flowering Rush (*Butomus umbellatus*) on the Blackwater; Common Calamint (*Calamintha ascendens*), Red Champion, Sand Leek (*Allium scorodoprasum*) and Wood Club-rush (*Scirpus sylvaticus*) on the Awbeg.

The site is also important for the presence of several E.U. Habitats Directive Annex II animal species, including Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*L. fluviatilis*), Twaite Shad (*Alosa fallax fallax*), Freshwater Pearl Mussel (*Margaritifera margaritifera*), Otter (*Lutra lutra*) and Salmon (*Salmo salar*). The Awbeg supports a population of White-clawed Crayfish (*Austropotamobius pallipes*). This threatened species has been recorded from a number of locations and its remains are also frequently found in Otter spraints, particularly in the lower reaches of the river. The freshwater stretches of the Blackwater and Bride Rivers are designated salmonid rivers. The Blackwater is noted for its enormous run of salmon over the years. The river is characterised by significant pools, streams, glides, and generally, a good push of water coming through except in very low water. Spring salmon fishing can be carried out as far upstream as Fermoy and is highly regarded

especially at Careysville. The Bride, main Blackwater upstream of Fermoy, and some of the tributaries are more associated with grilse fishing.

The site supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. The bat species Natterer's Bat, Daubenton's Bat, Whiskered Bat, Brown Long-eared Bat and Pipistrelle, can be seen feeding along the river, roosting under the old bridges and in old buildings.

Common Frog, a Red Data Book species that is also legally protected (Wildlife Act, 1976), occurs throughout the site. The rare bush cricket *Metrioptera rosellii* (Order Orthoptera) has been recorded in the reed/willow vegetation of the river embankment on the Lower Blackwater River. The Swan Mussel (*Anodonta cygnea*), a scarce species nationally, occurs at a few sites along the freshwater stretches of the Blackwater.

Several bird species listed on Annex I of the E.U. Birds Directive are found on the site. Some use it as a staging area, others are vagrants, while others use it more regularly. Internationally important numbers of Whooper Swan (average peak 174, 1994/95-95/96) and nationally important numbers Bewick's Swan (average peak 5, 1996/97-2000/01) use the Blackwater Callows. Golden Plover occur in regionally important numbers on the Blackwater estuary (average peak 885, 1984/85-86/87) and on the River Bride (absolute maximum 2,141, 1994/95). Staging Terns visit the site annually, with >300 Sandwich Tern and >200 Arctic/Common Tern (average peak 1974-1994). The site also supports populations of the following: Red Throated Diver, Great Northern Diver, Barnacle Goose, Ruff, Wood Sandpiper and Greenland Whitefronted Goose. Three breeding territories for Peregrine Falcon are known along the Blackwater Valley. This, the Awbeg and the Bride River are also thought to support at least 30 pairs of Kingfisher. Little Egret breed at the site (12 pairs in 1997, 19 pairs in 1998).

The site holds important numbers of wintering waterfowl. Both the Blackwater Callows and the Blackwater Estuary Special Protection Areas (SPAs) hold internationally important numbers of Black-tailed Godwit (average peak 847, 1994/95-95/96 on the callows, average peak 845, 1974/75-93/94 in the estuary). The Blackwater Callows also hold Wigeon (average peak 2,752), Teal (average peak 1,316), Mallard (average peak 427), Shoveler (average peak 28), Lapwing (average peak 880), Curlew (average peak 416) and Black-headed Gull (average peak 396) (counts from 1994/95-95/96). Numbers of birds using the Blackwater Estuary, given as the mean of the highest monthly maxima over 20 years (1974-94), are Shelduck (137 + 10 breeding pairs), Wigeon (780), Teal (280), Mallard (320 + 10 breeding pairs), Goldeneye (11-97), Oystercatcher (340), Ringed Plover (50 + 4 breeding pairs), Grey Plover (36), Lapwing (1,680), Knot (150), Dunlin (2,293), Snipe (272), Black-tailed Godwit (845), Bar-tailed Godwit (130), Curlew (920), Redshank (340), Turnstone (130), Black-headed Gull (4,000) and Lesser Black-backed Gull (172). The greatest numbers (75%) of the wintering waterfowl of the estuary are located in the Kinsalebeg area on the east of the estuary in Co. Waterford. The remainder are concentrated along the Tourig estuary on the Co. Cork side.

The river and river margins also support many Heron, non-breeding Cormorant and Mute Swan (average peak 53, 1994/95-95/96 in the Blackwater Callows). Heron occurs all along the Bride and Blackwater Rivers: 2 or 3 pairs at Dromana Rock; approximately 25 pairs in the woodland opposite; 8 pairs at Ardsallagh Wood and around 20 pairs at Rincrew Wood have been recorded. Some of these are quite large and significant heronries. Significant numbers

of Cormorant are found north of the bridge at Youghal and there are some important roosts present at Ardsallagh Wood, downstream of Strancally Castle and at the mouth of the Newport River. Of note are the high numbers of wintering Pochard (e.g. 275 individuals in 1997) found at Ballyhay quarry on the Awbeg, the best site for Pochard in Co. Cork.

Other important species found within the site include Long-eared Owl, which occurs all along the Blackwater River, and Barn Owl, a Red Data Book species, which is found in some old buildings and in Castlehyde, west of Fermoy. Reed Warbler, a scarce breeding species in Ireland, was found for the first time in the site in 1998 at two locations. It is not known whether or not this species breeds on the site, although it breeds nearby to the south of Youghal. Dipper occurs on the rivers.

Land use at the site is mainly centred on agricultural activities. The banks of much of the site and the callows, which extend almost from Fermoy to Cappoquin, are dominated by improved grasslands which are drained and heavily fertilised. These areas are grazed and used for silage production. Slurry is spread over much of this area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the populations of E.U. Habitats Directive Annex II animal species within it. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the Blackwater and its tributaries, and there are a number of angler associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. Other recreational activities such as boating, golfing and walking are also popular. Water skiing is carried out at Villierstown. Parts of Doneraile Park and Anne's Grove are included in the site: both areas are primarily managed for amenity purposes. There is some hunting of game birds and Mink within the site. Ballyhay quarry is still actively quarried for sand and gravel. Several industrial developments, which discharge into the river, border the site.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, over-grazing within the woodland areas, and invasion by non-native species, for example Rhododendron and Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively. Furthermore it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

5.3 Blackwater Estuary SPA site synopses

The Blackwater Estuary SPA is a moderately-sized, sheltered south-facing estuary, which extends from Youghal New Bridge to the Ferry Point peninsula, close to where the river enters the sea. It comprises a section of the main channel of the River Blackwater to Ballynaclash Quay. At low tide, intertidal flats are exposed on both sides of the channel. On the eastern

side the intertidal channel as far as Kinsalebeg and Moord Cross Roads is included, while on the west side the site includes part of the estuary of the Tourig River as far as Kilmagner.

The intertidal sediments are mostly muds or sandy muds, reflecting the sheltered conditions of the estuary. Green algae (*Ulva* spp.) are frequent on the mudflats during summer, and Bladder Wrack (*Fucus vesiculosus*) occurs on the upper more stony shorelines. The sediments have a macrofauna typical of muddy sands, with polychaete worms such as Lugworm (*Arenicola marina*), Ragworm (*Hediste diversicolor*) and the marine bristle worm *Nephtys hombergii* being common. Salt marshes fringe the estuarine channels, especially in the sheltered creeks.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Wigeon, Golden Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew and Redshank. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The Blackwater Estuary is of high ornithological importance for wintering waterfowl, providing good quality feeding areas for an excellent diversity of waterfowl species. At high tide, the birds roost along the shoreline and salt marsh fringe, especially in the Kinsalebeg area. The site supports an internationally important population of Black-tailed Godwit (620) and has a further seven species with nationally important populations: Wigeon (953), Golden Plover (2,628), Lapwing (3,054), Dunlin (1,807), Bar-tailed Godwit (161), Curlew (1,007) and Redshank (520) - all figures are mean peaks for the five winters 1995/96 to 1999/2000.

Other species which occur include Light-bellied Brent Goose (19), Shelduck (123), Teal (407), Mallard (105), Shoveler (21), Red-breasted Merganser (7), Cormorant (43), Little Egret (12), Grey Heron (17), Oystercatcher (40), Ringed Plover (28), Grey Plover (49), Knot (43), Greenshank (25) and Turnstone (52). The site is also notable for the large concentrations of gulls that occur in autumn and winter, including Lesser Black-backed Gull (390), Black-headed Gull (345), Common Gull (253), Great Black-backed Gull (227) and Herring Gull (64).

The Blackwater Estuary SPA is an internationally important wetland site on account of the population of Black-tailed Godwit it supports. It is also of high importance in a national context, with seven species having populations which exceed the thresholds for national importance. The occurrence of Little Egret, Golden Plover and Bar-tailed Godwit is of particular note as these species are listed on Annex I of the E.U. Birds Directive. The Blackwater Estuary is also a Ramsar Convention site.

5.4 Natura 2000 sites – Features of interests and conservation objectives.

The EU Habitats Directive contains a list of habitats (Annex I) and species (Annex II) for which SACs must be established by Member States. Similarly, the EU Birds Directive contains lists of important bird species (Annex I) and other migratory bird species for which SPAs must be established. Those that are known to occur at a site are referred to as 'qualifying interests' and are listed in the Natura 2000 forms which are lodged with the EU Commission by each Member State. A 'qualifying interest' is one of the factors (such as the species or habitat that is present) for which the site merits designation. The National Parks and Wildlife Service (NPWS) are responsible for the designation of SACs and SPAs in Ireland.

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network. European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status sites designated as Special Areas of Conservation and Special Protection Areas. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level. Favourable conservation status of a habitat is achieved when its natural range, and area it covers within that range, is stable or increasing, and the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when population data on the species concerned indicate that it is maintaining itself, and the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis. The species and habitats listed as qualifying interests for Blackwater River (Cork/Waterford) SAC & Blackwater Estuary SPA are included in **Table 2, 3 & 4**.

Table 2 Qualifying Species of the Blackwater River (Cork/Waterford) SAC

Species code	Species	Scientific name	Conservation objective
1095	Sea Lamprey	<i>Petromyzon marinus</i>	Restore
1096	Brook Lamprey	<i>Lampetra planeri</i>	Maintain
1099	River Lamprey	<i>Lampetra fluviatilis</i>	Maintain
1103	Twaite Shad	<i>Alosa fallax</i>	Restore
1106	Salmon	<i>Salmo salar</i>	Maintain
1355	Otter	<i>Lutra lutra</i>	Restore
1029	Freshwater Pearl Mussel	<i>Margaritifera margaritifera</i>	Under Review*
1092	White-clawed Crayfish	<i>Austropotamobius pallipes</i>	Maintain
1421	Killarney Fern	<i>Trichomanes speciosum</i>	Maintain

Restore = Restore favourable conservation condition, Maintain = Restore favourable conservation condition

*It is noted that the Freshwater Pearl Mussel will be removed as a conservation objective for the main Blackwater channel. This means that the water quality standard which must be met to ensure compliance with the requirements of the Habitats Directive in this section of the river is lower than was previously required.

Table 3 Qualifying Habitats of the Blackwater River (Cork/Waterford) SAC

Habitat Code	Habitat	Conservation objective
1130	Estuaries	Maintain
1140	Mudflats and sandflats not covered by seawater at low tide	Maintain
1310	Salicornia and other annuals colonizing mud and sand	Maintain
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	Restore
1410	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	Maintain
3260	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	Maintain
91E0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)	Restore

91J0	* <i>Taxus baccata</i> woods of the British Isles	Under Review
1220	Perennial vegetation of stony banks	Maintain
91A0	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in British Isles	Restore

Restore = Restore favourable conservation condition, Maintain = Restore favourable conservation condition

Table 4 Qualifying Species of the Blackwater Estuary SPA

Species code	Species	Scientific name	Conservation objective
A050	Wigeon	<i>Anas penelope</i>	Maintain
A140	Golden Plover	<i>Pluvialis apricaria</i>	Maintain
A142	Lapwing	<i>Vanellus vanellus</i>	Maintain
A149	Dunlin	<i>Calidris alpina</i>	Maintain
A156	Black-tailed Godwit	<i>Limosa limosa</i>	Maintain
A157	Bar-tailed Godwit	<i>Limosa lapponica</i>	Maintain
A160	Curlew	<i>Numenius arquata</i>	Maintain
A162	Redshank	<i>Tringa totanus</i>	Maintain
A999	Wetland and Waterbirds		Maintain

Restore = Restore favourable conservation condition, Maintain = Restore favourable conservation condition

To acknowledge the importance of Ireland's wetlands to wintering waterbirds, "Wetland and Waterbirds" may be included as a Special Conservation Interest for some SPAs that have been designated for wintering waterbirds and that contain a wetland site of significant importance to one or more of the species of Special Conservation Interest. Thus, a further objective is to maintain or restore the favourable conservation condition of the wetland habitat within the Blackwater Estuary SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

6. Water quality

6.1 EPA Monitoring

The Environmental Protection Agency carries out a biological assessment of most river channels in the country on a regular basis. The assessments are used to derive Q values, indicators of the biological quality of the water. The biological health of a watercourse provides an indication of long term water quality. The EPA Q value scheme is summarised in **Table 5**.

The intermediate ratings Q1-2, Q2-3, Q3-4 and Q4-5 are used to denote transitional conditions, while ratings within parenthesis indicate borderline values. Great importance is attached to the EPA biotic indices, and consequently it is these data that are generally used to form the basis of water quality management plans for river catchments. As the proposed development site adjoins an estuarine section of the River Blackwater, therefore freshwater biological monitoring data is only available for sites further upstream of the development. Results indicate that water quality is of a satisfactory condition (Q5) upstream (Bridge SW of Tourig Hall on the River Tourig) of the proposed development.

Table 5. EPA biotic index scheme.

Q value	Water quality	Pollution	Condition
5	Good	Unpolluted	Satisfactory
4	Fair	Unpolluted	Satisfactory
3	Doubtful	Moderately polluted	Unsatisfactory
2	Poor	Seriously polluted	Unsatisfactory
1	Bad	Seriously polluted	Unsatisfactory

Source: EPA

The EPA also monitors both coastal and transitional water bodies. Each can be assigned a classification of; Unpolluted, Intermediate, Potentially Eutrophic or Eutrophic. The former two are considered to be acceptable, while the latter two water quality ratings are considered as unsatisfactory. The transitional waters of the River Blackwater in close proximity to the development site have been assigned the classification of unpolluted.

6.2 Water Framework Directive - Lower Blackwater M Estuary / Youghal Harbour (IE_SW_020_0100)

The Water Framework Directive (WFD) is a key initiative aimed at improving water quality throughout the EU. It applies to rivers, lakes, groundwater, coastal & transitional waters. The Directive requires an integrated approach to managing water quality on a river basin basis; with the aim of maintaining and improving water quality. The Directive requires that management plans be prepared on a river basin basis and specifies a structured approach to developing those plans. It requires that a programme of measures for improving water quality be brought into effect.

Specifically the WFD aims to protect/enhance all waters (surface, ground and coastal waters), achieve "good status" for all waters, manage water bodies based on river basins (or catchments), involve the public and streamline legislation.

A) The Water Frameworks Directive assesses the water quality of rivers and ranks their status as follows: High, Good, Moderate, Poor, Bad, Yet to be determined. The Lower Blackwater M Estuary / Youghal Harbour status is determined to be **Moderate** based on the following parameters.

Table 6. Parameters

Dissolved Inorganic Nitrogen status	Good
Molybdate Reactive Phosphorus status	Good
Dissolved oxygen as per cent saturation status	Good
Biochemical Oxygen Demand (5-days) status	Moderate
Macroalgae - phytobiomass status	Moderate
Macroalgae - opportunistic algae status	Moderate
Fish status	Good
Morphology status	Less than Good
Specific Pollutant Status	Pass
Overall protected area status	Less than good

Ecological Status	Moderate
Chemical Status	Pass

B) The Water Framework Directive also determines the “Risk” level of the river as follows: 1a – At risk of not achieving Good Status, 1b – Probably at risk of not achieving Good Status, 2a – Expected to achieve Good Status, 2b – strongly expected to achieve Good Status. The Lower Blackwater M Estuary / Youghal Harbour is considered **1a - At risk of not achieving Good Status** based on the following parameters.

Table 7. Risk parameters

OSPAR	Probably At Risk
UWWT Regs Designations	At Risk
Marine Direct Impacts Overall - Worst Case	At Risk
Transitional Overall - Worst Case Overall (MIMAS) Morphological Risk - Worst Case (2008)	At Risk
Worst case of Point Overall and MDI Overall Overall (MIMAS) Morphological Risk - Worst Case (2008)	At Risk
WWTPs (2008)	At Risk
CSOs	Probably At Risk
Overall Risk from Point Sources - Worst Case (2008)	At Risk

C) The Water Framework Directive also sets out the future plans for the protection and restoration of rivers as follows: Protect, Restore – 2015, Restore – 2021, Restore - 2027. The objective for the Lower Blackwater M Estuary / Youghal Harbour is to be **Restored – 2021**.

7. Status of qualifying species and habitats for the Blackwater River SAC

7.1 Freshwater pearl mussel (*Margaritifera margaritifera*)

Margaritifera margaritifera is one of two European species of pearl mussel which are now on the International Union for the Conservation of Nature and Natural Resources (I.U.C.N.) red data list. *M. margaritifera* has Council of Europe protection under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern convention). The European Union Directive on the Conservation of Natural and Semi-Natural Habitats and of Wild Fauna and Flora (Habitats Directive) lists *M. margaritifera* under Annex II (species whose conservation requires the designation of special conservation areas) and Annex V (species whose taking in the wild and exploitation may be subject to management measures). Under Irish law, it is illegal to interfere with *M. margaritifera* (Statutory Instrument No. 112, 1990). As the area of the River Blackwater in the immediate vicinity of the proposed development is estuarine in nature, no potential impacts on this species are expected to occur.

7.2 Otter (*Lutra lutra*)

Otters, along with their breeding and resting places are protected under the provisions of the Wildlife Act 1976, as amended by the Wildlife (Amendment) Act, 2000. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Directive which is transposed into Irish law in the European Communities (Natural Habitats) Regulations (S.I 94 of 1997), as amended. Otters are also listed as requiring strict protection in Appendix II of the Berne Convention on the *Conservation of European Wildlife and Natural Habitats* and are included in the Convention on International Trade of Endangered species (CITES)). Although rare in parts of Europe, they are widely distributed in the Irish countryside in both marine and freshwater habitats.

This species is a qualifying interest for the Blackwater SAC which is one of the most important sites in Ireland for this species. Results from the most recent national survey found that 78% of sites surveyed within the SAC recorded the presence of otters.

Otter has been recorded within the estuary in the vicinity of the proposed development site. Otter is expected to hunt and breed within the River Blackwater. Any deterioration in water quality could potentially impact on this species by reducing the availability of prey. Noise and disturbance could impact on otter behaviour.

7.3 White clawed Crayfish (*Austropotamobius pallipes*)

White-clawed Crayfish in Ireland occurs in small and medium-sized lakes as well as rivers and streams and this is considered to be due to the lack of competition from other crayfish species. However the recent conformation Crayfish plague in the River Suir between Clonmel and Carrick-on-Suir has caused severe concern for the Irish population. Establishment of the crayfish plague could result in 100% mortality of the protected native White-clawed Crayfish.

This species was recorded from six sites on the Awbeg River in the 1960's (Toner & O'Connell, 1970). Surveys undertaken between 1990 and 2003 also confirmed a population of White-clawed Crayfish in the Awbeg (Demers et al. 2005). NS (2010) notes that this species was recorded in the Blackwater for the first time in September 2009.

This species occurs only in freshwater and as the proposed development adjoins an estuarine section of the River Blackwater, no potential impact on this species has been identified.

7.4 Lamprey species (*Petromyzon marinus*, *Lampetra planeri*, *Lampetra fluviatilis*)

The distribution of Lamprey species in the Blackwater River cSAC is detailed in King & Linnane (2004). Juvenile River/Brook and Sea Lamprey have been recorded from the main Blackwater channel and from the following watercourses: Licky, Bride, Araglin, Clyda, Allow, Owenkeal, Finnow, Owentaraglin, Awanaskirtaun River, Crooked River and Awbeg 2. Relatively high numbers of all three lamprey species were recorded from the main channel. Petit (2004) noted that "*The sea lamprey is commonly seen as far upstream as Mallow, where it has been observed spawning. River lamprey has been commonly encountered in the R. Blackwater, and brook lamprey adults have been caught in the upper reaches of the river.*"

Brook Lamprey (*Lampetra planeri*) is restricted to freshwater habitats and thus no potential impact on this species has been identified. River Lamprey and Sea Lamprey will migrate through the estuarine section of the River Blackwater. It is highly improbable given the limited

scale of the project, the absence of significant aqueous emissions and the dilution provided in the estuarine environment that there will be impacts on these species as they migrate through the estuary.

7.5 Twaite Shad (*Alosa fallax*)

Twaite shad is an anadromous fish which spends most of its life in estuaries and coastal waters, but migrates upriver to spawn in late April or May. Limited knowledge indicates that Irish twaite shad may live in estuarine waters for at least two full years prior to going to sea. Although there have been sporadic records of twaite shad from the east and west coasts, spawning has been confirmed only in the major river systems of the south-east, and even there is limited evidence for any recent spawning outside the Barrow and the Blackwater. The Overall Status of this species is assessed as Bad.

No records of the species have been recorded within the vicinity of the proposed development, however there is the possibility that the species may occur.

7.6 Atlantic salmon (*Salmo salar*)

The Blackwater system is considered one of the most important and prolific salmon rivers in Ireland and the main channel is a designated salmonid water (European Communities (Quality of Salmonid Waters) Regulations, 1988. Tributaries including relatively minor watercourses provide important spawning and nursery habitat.

7.7 Killarney fern (*Trichomanes speciosum*)

The Killarney Fern is categorised as rare and vulnerable in Ireland and is listed under Annex II and IV of the EU Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora). Killarney Fern belongs to the Filmy Fern family (Hymenophyllaceae) and is the only European representative of the genus *Trichomanes*. The species can occur as either sporophyte or gametophyte generations or together. Killarney fern generally requires specific habitat requirements which are found in dripping caves, cliffs, crevices and gullies by waterfalls, crevices in woodland, and occasionally on the floor of damp woodland - all deeply shaded humid habitats. This species is not likely to occur within the proposed site. Therefore, no impact on this species is predicted.

7.8 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation.

This habitat occurs only in freshwater and as the proposed development adjoins an estuarine section of the River Blackwater, no potential impact on this habitat has been identified.

7.9 Estuarine habitats

The estuarine designated habitats for the Blackwater River (Cork/Waterford) SAC are as follows: Estuaries, Mudflats and sandflats not covered by seawater at low tide, Perennial vegetation of stony banks, *Salicornia* and other annuals colonizing mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), and Mediterranean salt meadows (*Juncetalia maritimi*). These estuarine habitats occur in the lower catchment and in proximity to the development site, and thus, whilst unlikely, impacts on these habitats could potentially occur.

7.10 Terrestrial qualifying habitats

No potential impact on terrestrial qualifying habitats (Old sessile oak woods with Ilex and Blechnum in the British Isles, *Taxus baccata woods of the British Isles and *Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) has been identified as these habitats do not occur within the site boundary and alluvial woodlands are unlikely to occur in the estuarine sections of the river.

8. Status of qualifying species for the Blackwater Estuary SPA

The species listed as Special Conservation Interests of the Blackwater Estuary SPA are shown below in **Table 8**.

Table 8. Species listed as Special Conservation Interests of the Blackwater Estuary SPA and their Conservation status.

Species		Birds Directive Annex			BOCCI	
		I	II	III	Red List	Amber List
<i>Numenius arquata</i>	Curlew		X		X	
<i>Calidris alpinaschinzii</i>	Dunlin	X			X	
<i>Vanellus vanellus</i>	Lapwing		X		X	
<i>Limosa limosa</i>	Black-tailed Godwit					X
<i>Limosa lapponica</i>	Bar-tailed Godwit	X				X
<i>Tringa totanus</i>	Redshank				X	
<i>Anas penelope</i>	Wigeon		X	X	X	
<i>Pluvialis apricaria</i>	Golden Plover	X	X	X	X	

These species are not likely to occur within the Eras Eco facility. However due to the presence of nearby mudflats and areas of grassland in the vicinity of the proposed site and the surrounding landscape, a number of the species listed as species of conservation interest are expected to occur.

During 2009/2010 a waterbird survey programme was conducted by the NPWS within Blackwater Estuary SPA. This waterbird survey programme was designed to investigate how waterbirds are distributed across coastal wetland sites during the low tide period. The surveys ran alongside and were complementary to the Irish Wetland Bird Survey (I-WeBS). This survey consisted of four low tide counts (October, November and December 2009 and February 2010) and one high tide count (January 2010) where waterbirds were counted within a series of 11 count subsites within the SPA. The behaviour of waterbirds during counts was attributed to one of two categories (foraging or roosting/other) while the position of birds was recorded in relation to one of four broad habitat types; Intertidal (area between mean high water and mean low water), Subtidal (area that lies below mean low water), Supratidal and Terrestrial. In addition to the main survey programme described above, a high tide roost survey was completed on 7th March 2010.

A total of 43 waterbird species were recorded during the 2009/10 survey programme at Blackwater Estuary SPA which includes all species listed as conservation interests for the Blackwater Estuary SPA. Of note was the weather conditions recorded during the winter of

2009/10. December 2009 was the coldest for 28 years (Met Éireann (2009) and the cold spell persisted into the first half of January; January being the coldest on record for 25 years (Met Éireann, 2010). Such weather events are likely to affect waterbird distribution patterns across Ireland and Europe, and results of the Waterbird Survey Programme should be interpreted with this regard.

Of the species listed as special conservation interests for the Blackwater Estuary SPA, five were recorded in the estuary in the vicinity of ERAS ECO Ltd (Curlew (*Numenius arquata*), Lapwing (*Vanellus vanellus*), Black-tailed Godwit (*Limosa limosa*), Redshank (*Tringa tetanus*) and Wigeon (*Anas Penelope*). Golden Plover, Dunlin and Bar-tailed Godwit which were not recorded.

8.1 Curlew (*Numenius arquata*)

The Curlew has a widespread breeding range across temperate latitudes of the Palearctic region, occurring across Europe and Asia from Ireland in the west to northern China in the east (Delaney et al. 2009). The nominate subspecies breeds across Europe and winters in Europe. Ireland supports a small and declining population of breeding Curlew. Irish breeding Curlew are thought to make only short migrations and be mainly resident during winter. Wintering numbers are enhanced by birds moving in from breeding grounds in Fennoscandia, the Baltic and northwest Russia (Delaney et al. 2009) and Britain (Wernham et al. 2002).

Curlews are the largest intertidal wader to spend the non-breeding season within Ireland. Within intertidal areas they seek out larger prey items such as crabs, large worms and bivalves. Their de-curved bill is ideally suited to extracting deep-living worms such as Lugworms (*Arenicola marina*). Curlews are also known to heavily utilise agricultural grassland as foraging sites especially during periods of high tide. Curlews rely on large prey that takes more time to handle in contrast to many other wader species that swallow prey relatively quickly upon finding it. As a consequence, Curlews are territorial foragers and tend to occur widely spaced from each other to avoid competitive conflicts.

Curlew are usually well dispersed across the estuary while feeding, but generally roost communally, usually along salt marshes and sand banks. Curlew was recorded both roosting and foraging within the estuary in the vicinity of the proposed site. They were also recorded terrestrial foraging within agricultural grassland (outside of the SPA boundary) in the vicinity of the proposed site.

8.2 Black-tailed Godwit (*Limosa limosa*)

Black-tailed Godwits have a widespread Palearctic breeding distribution. Four populations are recognised – three populations of the nominate *L. l. limosa* and one *L. l. islandica*, the latter of which breeds almost exclusively in Iceland and winters in Britain, Ireland, Spain, Portugal and Morocco (Delaney et al. 1999).

Black-tailed Godwits are relatively large long-billed wading birds that forage within intertidal flats for their preferred prey of bivalves such as *Macoma balthica*, *Scrobicularia plana* and *Mya arenaria*. At some sites, polychaete worms form a larger proportion of the diet and the

species is relatively adaptable, utilising other habitats for foraging where available, such as terrestrial grassland, coastal marshes or freshwater callows.

Black-tailed Godwit was recorded in the majority of subsites but one of the subsites in proximity to the proposed development site, Foxhole to Youghal Bridge, contained Black-tailed Godwit during all four low tide surveys. Black-tailed Godwit was recorded both roosting and foraging within the estuary in the vicinity of the proposed site. Terrestrial foraging within agricultural grassland (outside of the SPA boundary) was only recorded on one occasion in a subsite not in proximity to the ERAS ECO Ltd facility, however terrestrial foraging is likely to occur regularly within other suitable grassland areas that are outside the SPA boundary.

8.3 Wigeon (*Anas Penelope*)

Wigeon have a widespread breeding distribution across northern Europe and Asia, from Iceland and northern Britain across Scandinavia, and northern Russia to the Russia to the Bering Sea coast (Wernham et al. 2002). The species is highly migratory. Five main wintering groups are known; birds breeding in northwest and northeast Europe and west Siberia spend winter in northwest Europe.

The Wigeon diet is almost entirely vegetarian and a major part of the diet comprises seagrass and algae species which are taken by grazing or dabbling in shallow water. Wigeon also forage within grasslands and agricultural crops for seeds, stems and rhizomes. A gregarious bird, they are rarely seen far from water.

Wigeon were recorded roosting within the estuary in proximity to the proposed development site. While they were not recorded foraging in the intertidal *Zostera noltii* bed within the vicinity of the site, they are likely to do so at other times/states of the tide.

8.4 Lapwing (*Vanellus vanellus*)

The Lapwing is a monotypic species and has a wide Palearctic breeding distribution from Britain and Ireland in the west to Eastern and southern Siberia in the east with a southern limit extending into Spain (Delaney et al. 2009). Birds breeding in Britain and Ireland are partial migrants with some residing over winter and some migrating south. The wintering population is enhanced by Lapwings moving in from continental Europe and northern and western Britain (Wernham et al. 2002). Cold weather movements can see a greater flux of birds to Ireland's estuaries.

Lapwings are traditionally 'inland' waders. During winter they can be observed across a wide variety of habitats, principally using lowland farmland and freshwater wetlands (e.g. turloughs and callows) but also coastal wetlands where they feed on a variety of soil and surface living invertebrates. They are opportunistic and mobile birds and will readily exploit temporary food sources such as newly-ploughed fields. Estuaries are typically used as roosting areas where large flocks may be observed roosting upon the tidal flats but coastal areas will also be used to a greater degree during cold weather events when farmland and freshwater habitats freeze over. There is evidence in the UK that utilisation of coastal habitats has increased, coupled with an increase in intertidal feeding (Gillings et al. 2006).

Lapwing were recorded both foraging and roosting in the surrounding estuary in proximity to the site. They were also recorded terrestrial foraging in the surrounding landscape.

8.5 Redshank (*Tringa tetanus*)

Redshank (*Tringa tetanus*) breeds widely across the Palearctic in a band that extends both into the low arctic and Mediterranean zones, from Iceland through continental Europe and Russia to eastern Siberia, China and Mongolia. The taxonomy of the species has proved complex but five populations are currently recognised including *T. t. britannica*, a small and declining population that breeds in Britain and Ireland, and *T. t. robusta* that breeds in Iceland and the Faeroes and winters in Britain, Ireland and the North Sea area (Delaney et al. 2009).

Redshanks forage mainly by pecking at the surface or probing within intertidal mudflats; generally favouring the muddier sections of sites where they prey upon species such as the Ragworm (*Hediste diversicolor*) and Mud Snail (*Hydrobia ulvae*). A particularly favoured prey is the burrowing amphipod *Corophium volutator*.

Redshank was recorded foraging and roosting within the estuary in close proximity to the development site. On one occasion redshank was recorded foraging terrestrially and outside the SPA boundary in the surrounding landscape in proximity to the site.

9. Assessment of Potential Impacts

All potential impacts would relate to discharges into Blackwater Estuary, and impacts to relevant habitats and fauna. Based on the EC Article 6 Guidance Document (2001) and IEEM guidelines 'Guidelines for Ecological Impact Assessment' (IEEM, 2006) impacts are listed as significant using a combination of professional judgement and criteria or standards where available, if impacts have the potential to have a significant impact on the ecological integrity on the habitats and species for which the site is designated. As the Natura 2000 sites are of International importance, any significant adverse impacts would be significant at an 'International' level. However, where impacts are expected not to have a significant impact on the integrity of these habitats at an International level but are likely to have National or Local level impacts, this has been stated.

The potential impacts associated with the proposed development are discussed in the following section with respect to their likelihood to have significant impacts on Natura 2000 sites. As part of the assessment direct, indirect and cumulative impacts were considered. Potential impacts were identified as follows:

- Direct Impact-Loss of Habitat
- Indirect impacts from noise and disturbance
- Indirect Impacts during construction
- Direct Impact / Indirect -Impacts on Water Quality and aquatic ecology during operation
- Indirect Impacts from the WWTP discharge
- Indirect impact from Air Emissions
- Cumulative Impacts

9.1 Loss of habitat

Any habitat loss of Natura 2000 sites or deterioration in habitat quality would reduce the extent of habitat available for species. This would decrease the viability of existing habitats and increase the pressure on existing habitat and may result in further deterioration.

The site is not located within a designated site and the habitats recorded within the proposed development boundary do not correspond to habitats listed on Annex 1 of the Habitats Directive or qualifying habitats for the Blackwater River (Cork/Waterford) SAC. It is noted that the proposed development will not result in any loss of habitat within Natura 2000 sites.

9.2 Impacts from noise and disturbance

Potentially increased noise and disturbance associated with the site works could cause disturbance/displacement of fauna. If of sufficient severity, there could be impacts on reproductive success. With respect to birds, the Blackwater Estuary SPA is located in close proximity to the site.

Theoretically disturbance of important qualifying bird species could occur during construction works. Predicting potential impacts on birds from disturbance can be problematic. Although there are many instances where waterfowl and people appear to co-exist on estuaries, there are widespread examples where effects and impacts of varying severity have been described.

Optimal foraging theory is a useful basis from which to understand likely effects of disturbance on feeding. Many studies have shown that birds concentrate where feeding is best. If birds are forced temporarily or permanently to leave these places, then there is an increased risk that their foraging ability will suffer. However, the severity of this type of situation and the way in which birds respond; vary in a very complex way. The multiplicity of variables underlying the observed interactions between birds and people makes it difficult to assess the cause and implications of a particular instance of disturbance. The magnitude of disturbance to birds may arise from synergistic effects of more than one activity.

Burger (1981), in a study of a coastal bay, found that birds were present 42% of the time when people were present, but birds were present 72% of the time when people were absent. Human activities such as jogging or grass mowing, which involved rapid movement or close proximity to roosting birds, usually caused them to flush (fly away). Slow-walking birdwatchers and clammers did not usually cause birds to flush. Gulls and terns were least affected and usually returned to where they had been; ducks usually flushed and flew to the centre of the pond; and herons, egrets and shorebirds were most disturbed and flushed to distant marshes.

The potential effects and impacts of disturbance have been widely recognised in wildlife conservation legislation, as has the need to develop conservation measures for birds whilst taking human activities into account. Article 4.4 of the Bird's Directive (79/409/EEC) requires member states to "*take appropriate steps to avoid... any disturbances affecting the birds, in so far as these would be significant having regard to the objectives of this Article*". This specifically relates to conservation measures concerning Annex I species.

It is noted that the proposed development site is located on the outskirts of Youghal town and is subject to noise disturbance and light pollution from neighbouring industries. During the construction stage, there may be short-term increases in disturbance but it will not be significant in the context of existing noise levels. Given the scale and temporary nature of the works, the distance involved and the already existing potential disturbance factors, the impact on bird populations within the SPA is predicted to be negligible. During operation there will not be a significant increase in noise or activity associated with the

Potential impacts could arise due to disturbance of otter as a result of increased noise and activity during site works. This could potentially lead to changes in feeding behaviour which if of sufficient severity could impact on reproductive success. Disturbance of breeding otter could also have an impact on overall populations within the Blackwater River (Cork/Waterford) SAC.

Otters, along with their breeding and resting places are protected under the provisions of the Wildlife Act 1976, as amended by the Wildlife (Amendment) Act, 2000. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Directive which is transposed into Irish law in the European Communities (Natural Habitats) Regulations (S.I 94 of 1997), as amended. Otters are also listed as requiring strict protection in Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats and are included in the Convention on International Trade of Endangered species (CITES).

Whilst works could potentially disrupt feeding patterns, given the short-term nature of the disturbance, the often nocturnal habits of otter and the ability of otter to move away from disturbance, the long-term impact on the feeding behaviour of this species is predicted to be imperceptible.

In relation to breeding habitat, it is considered highly improbable that otter holts occur in close proximity to the proposed development given the low value breeding habitat available and the ready availability of alternative sites which are not subject to the same level of disturbance. Whilst some ground vibration may occur during the construction phase, it will have a negligible impact in the context of existing levels of noise and disturbance. Overall therefore the impact of the proposed development on the breeding success for otter within the Blackwater River (Cork/Waterford) SAC is predicted to be negligible.

9.3 Impacts during construction

High levels of silt in surface water run-off can impact in particular on fish species. If of sufficient severity, adult fish could theoretically be affected by increased silt levels as gills may become damaged by exposure to elevated suspended solids levels. Excessive siltation can cause eggs and fry to be smothered. Such run-off if severe could potentially impact on water quality and thus could impact on aquatic qualifying species for the Blackwater River (Cork/Waterford) SAC which migrate through or occur within the estuary (Sea lamprey *Petromyzon marinus*, River Lamprey *Lampetra fluviatilis*, Shad *Alosa fallax* and Salmon *Salmo salar*).

Impacts on water quality could also impact on fish stocks which in turn could impact on populations of otter (*Lutra lutra*). Impacts on qualifying habitats which are estuarine in nature (Estuaries, Mudflats and sandflats not covered by seawater at low tide, Perennial vegetation of stony banks, Salicornia and other annuals colonizing mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) and Mediterranean salt meadows (*Juncetalia maritimi*) could potentially occur but are very unlikely to be affected given the limited scale of the proposed works and the dilution available in the estuary.

Elevated silt levels could theoretically, if of sufficient magnitude, result in changes in the ecology of River Blackwater SAC. It is noted however that due to the dilution provided in the estuarine environment and the naturally fluctuating levels of silt, impacts are only likely to arise from extremely severe levels of siltation. The risk of significant silt levels being generated is very low given the limited scope of the proposed development. Given the limited nature of the works, the precautionary measures to be implemented, the robust nature of qualifying habitats

and the dilution provided in the estuarine environment, any impacts on water quality due to elevated silt levels during construction is considered negligible.

Inadvertent spillages of hydrocarbons during construction could introduce toxic chemicals into the aquatic environment via surface water run-off or groundwater contamination. The existing site consists of hardstanding. Works will take place within the existing site which is completely kerbed and there will be no fugitive runoff from the site. All runoff from the site is currently directed to the storm water attenuation tank and two silt/ oil interceptors (Class 1) prior to discharge from the site. Given the precautionary measures to be implemented, the dilution provided in the estuarine environment and the qualifying habitats in question, any impacts on water quality due to such minor spills of hydrocarbons during construction is considered negligible.

In the absence of significant predicted impacts on water quality no significant impact on macroinvertebrate populations on which birds species listed as qualifying interests for the Blackwater Estuary feed are predicted. The impact on these bird species is therefore predicted to be negligible.

9.4 Impacts on Water Quality during operation

An Environmental Liability Risk Assessment (O' Callaghan Moran) prepared for the facility lists the following as potential sources of impacts on water quality;

1. Risk of surface water and/ or soil and groundwater contamination associated with diesel storage and handling.
2. Risk of surface water and/or soil and groundwater contamination associated with waste oil handling.
3. Risk of surface water and/or soil and groundwater contamination associated with a fire.
4. Risk of surface water and/or soil and groundwater contamination associated with a failure of the digester tanks.

Chemicals contaminants such as hydrocarbons can if severe could potentially impact on water quality and thus could impact on aquatic qualifying species for the Blackwater River (Cork/Waterford) SAC which migrate through or occur within the estuary (Sea lamprey *Petromyzon marinus*, River Lamprey *Lampetra fluviatilis*, Shad *Alosa fallax* and Salmon *Salmo salar*).

Impacts on water quality could also impact on fish stocks which in turn could impact on populations of otter (*Lutra lutra*). Impacts on qualifying habitats which are estuarine in nature (Estuaries, Mudflats and sandflats not covered by seawater at low tide, Perennial vegetation of stony banks, Salicornia and other annuals colonizing mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) and Mediterranean salt meadows (*Juncetalia maritimi*) could potentially occur.

The Risk Analysis Form from the Environmental Liabilities Report (O Callaghan Moran, 2017) is included as **Appendix 2** of this report. It concludes that the impacts from such events generally range from trivial to minor. Two possible moderate impacts were identified as follows:

Escape of firewater to surface water and foul water drainage systems was considered a moderate impact. The report concluded that the shut off valve on the surface water drain will contain runoff within the site and that the amount of firewater entering the combined sewer would be low and would receive significant dilution before it reached the Blackwater Estuary.

Entry of liquid from AD Tanks & Digestate Storage Tanks to surface water drains due to rupture of tank or damage to pipework as result of structural failure or explosion was considered a moderate risk. The report concluded that given the restricted flow from the retention tank, the presence of the shut off valve and the dilution available in the river, the severity of impact, including cost of remediation would be Moderate.

A range of mitigation measures will be implemented at the facility. In general the estuarine habitats listed as qualifying interests for the Blackwater River SAC (Mudflats and sandflats not covered by seawater at low tide, Perennial vegetation of stony banks, Salicornia and other annuals colonizing mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) and Mediterranean salt meadows (*Juncetalia maritimi*) are robust. Given the comprehensive mitigation measures to be implemented at the facility, the dilution provided in the estuarine environment and the qualifying habitats in question, any impacts on water quality will not significantly impact on qualifying habitat interests for the Blackwater River SAC.

Sea lamprey *Petromyzon marinus*, River Lamprey *Lampetra fluviatilis*, Shad *Alosa fallax* and Salmon *Salmo salar*) will occur in the lower estuary but the migratory species will only move through the estuary and thus will only be present for a limited time period. No significant impacts on fish stocks or otter is predicted. Given the comprehensive mitigation measures to be implemented at the facility, the dilution provided in the estuarine environment and the qualifying habitats in question, any impacts on water quality will not significantly impact on qualifying species for the Blackwater River SAC.

In the absence of significant predicted impacts on water quality no significant impact on macroinvertebrate populations on which birds species listed as qualifying interests for the Blackwater Estuary feed are predicted. The impact on these bird species is therefore predicted to be negligible.

9.5 WWTP discharge

An onsite WWTP and proprietary treatment system will treat effluent in line with current EPA guidelines which have been designed to provide adequate environmental protection before being discharged into the sewer network. Any impact on water quality during operation will be negligible.

9.6 Air Emissions

Emissions of dust during construction will be not be significant and will not impact on designated habitats outside the facility boundary. The current emissions to air comply with the licence conditions.

Methane gas from the anaerobic digesters will be passed through a scrubbing system before entering the CHP plant. The exhaust from the CHP plant (A4) is considered a main emission point.

The existing and proposed discharges from all relevant air emission points on-site have been modelled and the results show that the overall air emissions from the site will have a negligible impact on the surrounding environment.

9.7 Cumulative Impacts

Cumulative impacts refer to a series of individually impacts that may, in combination, produce a significant impact. The underlying intention of this in combination provision is to take account of cumulative impacts from existing or proposed plans and projects and these will often only occur over time.

The Blackwater River (Cork/Waterford) SAC is a large site and potential threats include land reclamation, industrial discharges, recreational disturbance, development of cord-grass (*Spartina sp.*) and flood relief works. There are major discharges of wastewater in several towns including Mitchelstown, Fermoy, Mallow, Lismore and Youghal. Further residential and commercial developments are proposed within the catchment. Threats to the Blackwater SPA/SAC include agricultural impacts on water quality and increased disturbance. However in the absence of any predicted impacts from the proposed development, no in-combination impacts have been identified.

11. Conclusions

The only Natura 2000 sites for which potential significant impacts have been identified are the Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA.

A range of mitigation measures have been incorporated into the project design, and other mitigation measures have been developed and proposed, with the purpose of avoiding or minimising impacts on the qualifying interests and conservation objectives of the Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA. The likely success of these measures was also considered and no difficulties in their effective implementation were identified.

The provisions of Article 6 of the 'Habitats' Directive 92/43/EC (2000) defines 'integrity' as the 'coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and / or population of species for which the site is or will be classified'. *The draft documents Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (Draft)* (EC, 2015) states that the integrity of the site can be usefully defined as the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated"

Following a comprehensive evaluation of the potential direct, indirect and cumulative impacts on the qualifying interests and conservation objectives for the Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA, it has been concluded that the proposed development will not have an adverse effect on the integrity of the Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA or any other Natura 2000 sites.

12. Reference list

Fossitt, J. A. (2000). A Guide to Habitats in Ireland. The Heritage Council of Ireland Series
Environmental Protection Agency Ireland (<http://www.epa.ie/>)

Invasivespecies Ireland (<http://invasivespeciesireland.com/>)

National Biodiversity Data Centre (<http://www.biodiversityireland.ie/>)

National Parks and Wildlife Service website (www.npws.ie)

BWPi (2004) Birds of the Western Palearctic Interactive. BirdGuides Ltd. 2004.

Delaney, S., Scott, D., Dodman, T. & Stroud, D. (2009) (eds) An atlas of wader populations in Africa and Western Eurasia. Wetlands International, Wageningen, The Netherlands.

Gillings, S., Austin, G. E., Fuller, R. J., & Sutherland, W. J. (2006) Distribution shifts in wintering Golden Plover *Pluvialis apricaria* and Lapwing *Vanellus vanellus* in Britain. Bird Study 53, 274-284.

NPWS (2012) Blackwater Estuary Special Protection Area (Site Code 4028) Conservation Objectives Supporting Document VERSION 1.

NPWS (2013) The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments Volume 2. Version 1.1. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland

Wernham, V. V., Toms, M. P., Marchant, J. H., Clark, J. A., Siriwardena, G. M. & Baillie, S. R. (eds)(2002) The Migration Atlas: movements of birds of Britain and Ireland. T & A D Poyser. London.

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