ENVIRONMENTAL IMPACT STATEMENT

FOR

ADDITIONAL WASTE ACTIVITIES

AT

ERAS ECO Ltd,

FOXHOLE,

YOUGHAL,

COUNTY CORK

December 2010

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NON-TECHNICAL SUMMARY

Introduction

ERAS ECO Ltd is Cork's leading sludge management company and has been operating its facility at Foxhole, Youghal since 2007. The facility operates under a Waste Licence issued by the Environmental Protection Agency (EPA) and treats sewage sludge from local authority sewerage treatment plants and non-hazardous sludges from industrial waste water treatment plants operating mainly in the Cork area. Currently the sludge is dried at the facility, before being shipped Germany for use as a fuel.

The site can also take in recyclable waste (paper, cardboard, plastic, metal, wood) from local businesses and industries, but this stopped in 2009 as the quantities were too small to make economic sense. The reasons for the fall off was a combination of the reduction in the amount of waste being produced and that the customers wanted a full service collection, which included mixed waste containing non-dry recyclables, for example food waste. Therefore there is a need to expand on the types of waste that can be accepted in order to meet customer needs.

ERAS ECO Ltd has seen an opportunity to introduce a new way of sludge treatment (anaerobic digestion) that will produce electricity and heat which can either be used on site or sold to the National Grid. ERAS ECO Ltd has also identified an opportunity to expand its recycling/recovery treatment capacity to include the treatment of hazardous wastes produced by the chemical and pharmaceutical manufactures in the Cork region and which are currently sent overseas for disposal.

The proposed changes to the waste activities requires planning permission and a revision of the Waste Licence and this Environmental Impact Statement (EIS) has been prepared as part of the planning and waste licence applications. ERAS ECO Ltd discussed the proposed changes with its neighbours and also Youghal Town Council when the EIS was being prepared

Existing Site

The site occupies almost 1.6 hectare and is approximately 2km from Youghal There are two main processing buildings, offices, weighbridges, a vehicle wash, paved open yards and parking areas (Drawing 10P521-01). The site operations use electricity supplied by the ESB and water from the Council mains supply. Sanitary waste water is treated in an on-site wastewater treatment plant. There are 6 full time and 3 part time workers including management, technical and staff office staff and general operatives.

The sludge treated at the site is produced at sewerage works operated by the local authorities and wastewater treatment plants at industrial sites. The sludge is treated in a dedicated building (Building 2). The treatment involves drying the sludge using heat from a wood chip fired boiler and also the addition of lime. The steam is collected and condensed and treated in an on-site wastewater treatment plant. The air inside the building is also collected and treated in an odour control plant. The treated sludge is exported to Germany where it is used as a fuel. At present, the site has approval to treat 30,000 tonnes of sludge per year

ERAS ECO Ltd had offered a solid recyclable wastes (paper, cardboard, plastic, metal etc) service to businesses and industries. At present, the site has approval to take in 70,000 tonnes per year of these wastes. Up to 2009, the materials were taken in, checked and processed (separated into the different types) in a dedicated building (Building 1) and then sent on to other recovery plants. However, for commercial reasons this stopped in 2009. The building is now used to store wood chip for the boiler and sludge awaiting treatment.

Proposed Changes

The new anaerobic digestion plant consist of two above ground digester tanks, which will treat the sludge and produce a gas (methane) that will be used to generate electricity and heat in a new generator. The electricity will be used at the facility instead of the ESB supply and the heat may be used in the existing sludge drying process. The residue from the process, which will include a fibre like solid and a liquid will be treated in the sludge drier and the wastewater treatment plant. The new system will allow ERAS ECO Ltd to treat an extra 10,000 tonnes of sludge per year

The new sludge and liquid hazardous waste treatment system (Aquacritox) uses water and oxygen under high pressure to breakdown the hazardous components in the waste (super critical water oxidisation) and convert them to carbon dioxide and nitrogen gas, leaving behind clean water a solid inert residue. The process generates heat which may be used in the sludge drying process. The liquid wastes and the oxygen used in the process will be stored in new above ground storage tanks.

The Aquacritox plant will be located inside the Sludge Drying Building and will have the capacity to treat 30,000 tonnes of waste per year. This is only a small fraction of the overall amount of hazardous waste that is at present being exported from the country. The plant will take approximately 12 months to install and commission. There is enough room in the building to install an additional plant to increase treatment capacity.

The producers of the hazardous waste require it to be removed from their sites as soon as possible. ERAS ECO will provide storage tanks with a capacity of 500m^3 to store the waste awaiting treatment. Occasionally, because of the amount arriving at the site at the same time, there may not be enough storage capacity at the site. If this occurs, the road tankers in which the wastes are delivered will be temporarily parked in a dedicated parking area, before being sent to other recovery plants, either in Ireland or overseas.

It is proposed to accept non-hazardous mixed waste that contains some foodstuffs from businesses, industries and households. This is in response to customer need for a full service collection. The wastes will be taken in, checked and processed in the Waste Recovery Building. As the wastes will contain materials that can cause smells, an odour control system will be provided. The proposed site layout is shown on Drawing No 10P521-02

At present, the site has approval to take in 110,000 tonnes of waste per year, which includes:

Commercial & Industrial Waste	70,000 tonnes
Non-Hazardous Sludge	30,000 tonnes
Leachate from Landfills	10,000 tonnes

The proposed changes will reduce the overall quantities of waste to 95,000 tonnes/year, which will include:

Commercial & Industrial and Household Waste	20,000 tonnes
Non-Hazardous Sludge	40,000 tonnes
Hazardous Waste	30,000 tonnes
Leachate from Landfills	5,000 tonnes

Waste Management Policies

The proposed changes are consistent with European Union, national and regional waste management policies and plans. The proposed anaerobic digestion system, which will produce electricity and heat, complies with national and regional policy on biological treatment and development of renewable energy sources. The proposed Aquacritox system will meet the need identified in the National Hazardous Waste Management Plan (2008) to reduce the dependency on the export of hazardous waste. The system is also referenced in the Plan as one of the alternative treatment technologies for hazardous waste.

Existing Environment, Potential Environmental Effects and Mitigation Measures

Climate

The climate in the area is mild and wet, with the prevailing wind from the south west. The proposed changes will not have any impact on the local climate. The reduction in reliance on non renewable sources of electricity due to on-site generation using the biogas will have a positive impact in reducing the facility's overall carbon footprint

Soils & Geology

The soils at the site comprise made ground overlying a gravely clay. The underlying bedrock is limestone. The proposed changes will only require minor disturbance of the ground and will not give rise to any new emissions to the ground and therefore there will be no impacts on soil.

Water

Water quality monitoring has found the quality of the rainwater run-off from the site is good. The proposed changes will not affect the quality of the run-off. It is proposed to collect rainwater from the roofs and use in the treatment process. This will reduce the amount of run-off from the site and also the volume of water taken from the mains supply, which will have a positive impact. As there will be no direct discharge to groundwater, the impacts on groundwater will be imperceptible.

At present, the water from the sludge drier is collected and treated in the on-site wastewater treatment plant and the treated water is discharged to the estuary. In the long term it is proposed to connect to the Council's sewer, when the new Youghal Town sewerage treatment works is opened. The Waste Licence defines the quality of the discharge and the flow rate to ensure that it does not affect the water quality or ecology in the estuary. The Licence also requires ERAS ECO Ltd to monitor the quality of the treated water to ensure the treatment plant is working properly. At present the wastewater treatment is being upgraded.

The proposed changes will not affect the quality of the treated water discharged to the estuary and will have a neutral impact.

Ecology

The site is either paved or covered by buildings. It is not proposed to disturb any ground and the proposed changes will have no impact on the local ecology. The treated effluent from the waste water treatment plant goes into the estuary of the Blackwater River. Although there will be an increase to the effluent quality, an Appropriate Assessment was undertaken and a Natura Impact Statement prepared due to the Blackwater's designation as a Natura 2000 site. This Natura Impact Statement is separate from the EIS, but was submitted with the planning application under separate cover.

Air Quality

The proposed changes will mean a reduction in the level of traffic to and from the facility that is currently approved, with a consequent drop in exhaust emissions and dust. The current dust control measures, which include damping down paved areas in dry weather, have proven to be effective and will continue to be used.

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 This control

system has proven to be effective. Odours from the building where the mixed Household and mixed Commercial & Industrial wastes will be processed will be controlled by a new odour control system, which will include an air collection system and specially designed filter. The proposed changes will have a negligible impact.

Noise

All waste processing is and will continue to be carried out either in doors or in fully enclosed units. Noise surveys carried out to assess the noise from the proposed changes have established that they will not cause an impact at the nearest residence, which is approximately 250m away. The proposed changes will have a neutral impact.

Landscape

The new storage tanks and digesters will be smaller than the existing buildings and will not be visually obtrusive. The changes will have a neutral impact on the landscape.

Traffic

The proposed changes, which will result in a reduction in the amount of waste accepted from 110,000 tonnes to 95,000 tonnes/year, means that there will a decrease in the traffic to and from the site The local road network will not be affected and there will be a positive impact associated with the reduction in traffic.

Cultural Heritage

There are no known archaeological, heritage or socio-cultural features on the site. The development works will involve limited ground disturbance and therefore will not have an impact on cultural heritage

Human Beings

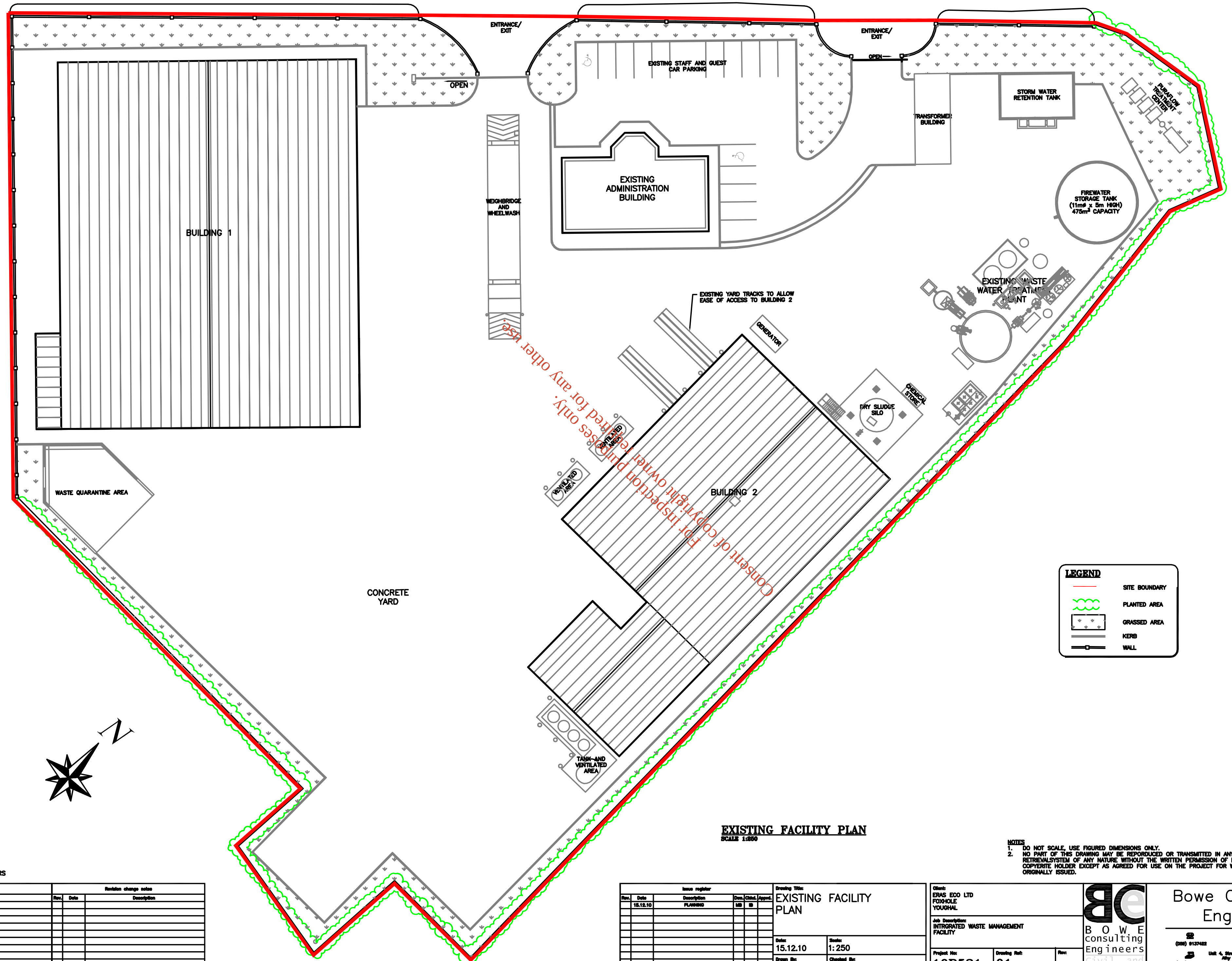
Land use in the surrounding area is a mix of industrial, commercial, residential and agricultural. The nearest house is approximately 250m from the site boundary. There are no hospitals, hotels or holiday accommodation within 1 km of the site. The odour control measures that will be provided will ensure that odours from the handling of the household waste will not cause problems. Any impacts associated with the changes will be negligible.

Material Assets

The site is in an area zoned for industrial and related development, and it does not have a significant leisure or amenity value. The potential for damage to amenities and leisure land use arising from the proposed changes is negligible

Interaction of the Foregoing

The proposed changes have the potential to impact on human beings. The reduction in traffic volumes and rainwater run-off will have a positive impact on the air quality (dust and exhaust emissions) and usage of the mains water supply. There is the potential for impacts associated with noise, odour and traffic. The location, design and proposed method of operation have taken these potential impacts into account. Proven effective control measures will be used to ensure that the facility will have an overall neutral impact. These measures will be specified in the revised Waste Licence that will be issued by the EPA.



EXISTING FACILITY PLAN

SCALE 1:250

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Referenced drawings		Revision change notes		
Dwg No.	Dwg Title	Rev.	Date	Description

Issue register					
Rev.	Date	Description	Drn.	Chkd.	Apprd.
	15.12.10	PLANNING	MB	IB	

Drawing Title: EXISTING FACILITY PLAN
Date: 15.12.10
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Checked By: IB

Client: ERAS ECO LTD, FOXHOLE, YOUGHAL
Job Description: INTRGRATED WASTE MANAGEMENT FACILITY
Project No: 10P521
Drawing Ref: 01
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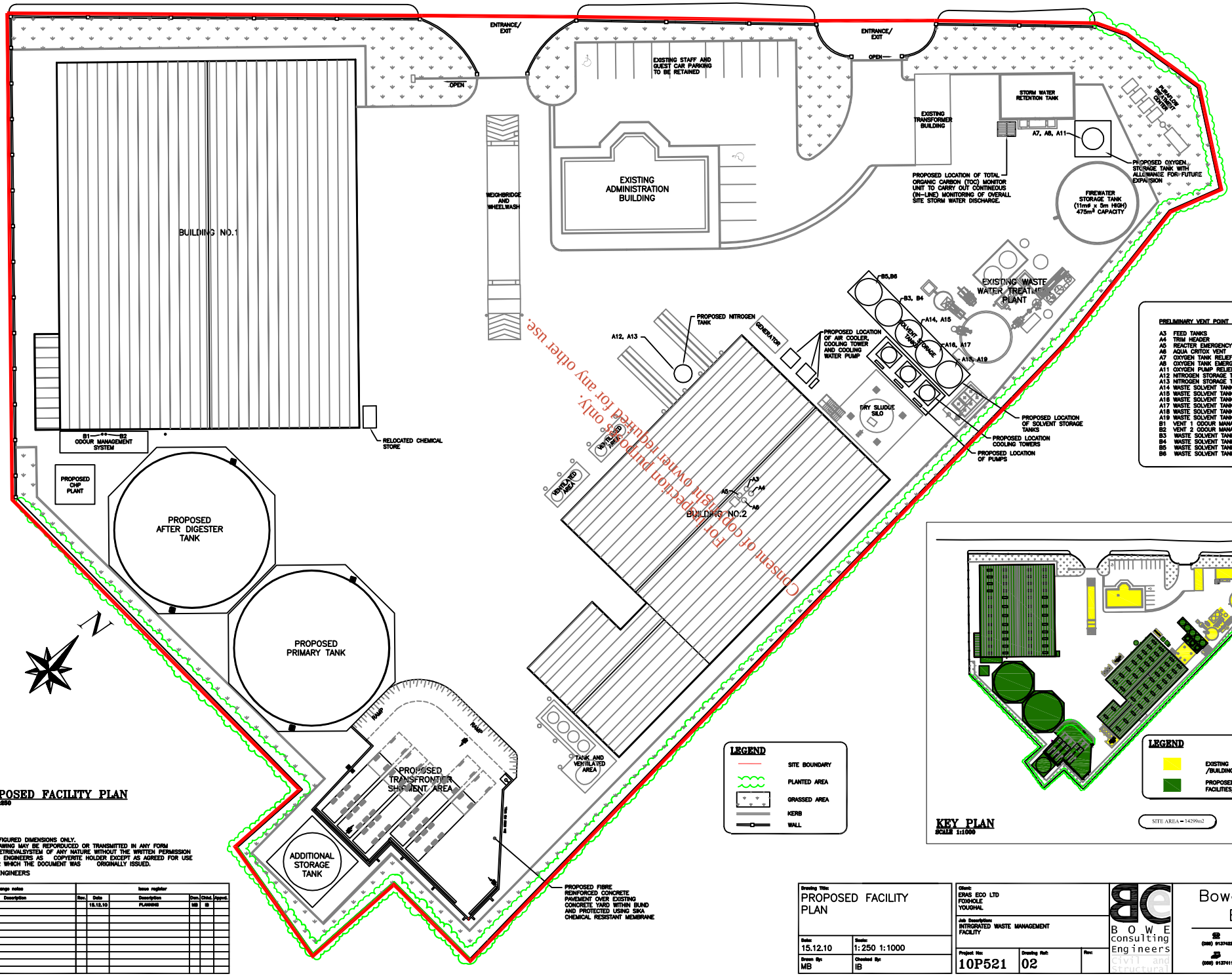

PROPOSED FACILITY PLAN
SCALE 1:250

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Rev.	Date	Description	Rev.	Date	Description	Drn.	Chkd.	Apprvd.
				15.12.10	PLANNING	MB	IB	

Drawing Title:	PROPOSED FACILITY PLAN
Date:	15.12.10
Scale:	1:250 1:1000
Drawn By:	MB
Checked By:	IB

Client:	ERAS ECO LTD FOXHOLE YOUGHAL
Job Description:	INTRGRATED WASTE MANAGEMENT FACILITY
Project No:	10P521
Drawing Ref:	02
Rev:	

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PREAMBLE

This Environmental Impact Statement (EIS) has been prepared part of a planning permission application at the ERAS ECO Ltd. Foxhole, Youghal, County Cork relating to the expansion of the waste activities carried out at the facility.

An EIS was prepared as part of an earlier planning application for the original development of the non-hazardous sludge treatment and solid waste recovery facility, for which permission was granted by Cork County Council in 2005. This EIS is an update of that document.

In addition to the current planning permission, the facility has a Waste Licence (Reg No. W0211-01) issued by the Environmental Protection Agency (EPA), which regulates the environmental emissions from the waste recovery activities.

ERAS ECO Ltd proposes to expand waste recovery activities at the facility to ensure its commercial viability and offer sustainable solutions to waste management in the region/country. The proposed changes require both planning permission and a revision of the Waste Licence.

A pre-consultation process was undertaken with the planning authority as part of the scoping of the environmental assessment. ERAS ECO Ltd informed the occupiers of the commercial premises in the area surrounding the site of its proposals and also issued a press release to inform members of the general public in advance of the lodgement of the planning application.

The design of the new waste activities and proposed method of operation are based on Best Available Technique (BAT). The EIS examines the proposed activities and assesses potential impacts and significant effects on the environment. The information contained in the EIS complies with Paragraph 2 of the Second Schedule of the European Communities Environmental Impact Assessment Regulations 1989, as amended by the European Communities (Environmental Impact Assessment) (Amendment) Regulations 2001.

The EIS follows the grouped format structure recommended in the Guidelines on the Information to be Contained in Environmental Impact Statements (March 2002), published by the Environmental Protection Agency (Agency), and the Agency's Advice Notes to these Guidelines. This structure assesses each relevant topic in a separate section, which describes the existing environment, the impacts associated with the proposed development and where considered necessary, the proposed mitigation measures.

The contributors to the EIS were:

Bowe Consulting Engineers. – Site Design, Layout and Drainage

Address: Unit 4,
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BHP–Noise and Particulate Assessment

Address: New Road,
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Hydro-Environmental Services-Soil, Geology and Water

Address: 22 Lower Main street,
Dungarvan,
Co. Waterford.

Odour Monitoring Ireland – Air Quality Impact Assessment

Address: Unit 32,
DeGranville Court,
Dublin Rd,
Trim,
Co. Meath.

Scott Cawley. – Ecological Assessment/Appropriate Assessment – Natura Impact Statement

Address: 27 Lower Baggot Street,
Dublin 2
Ireland.

No significant difficulties were encountered during the preparation of this EIS. As the site is already entirely covered with paving or buildings and proposed changes will not involve significant ground disturbance, detailed Archaeological & Cultural Heritage Assessments were not conducted. As the proposed changes will result in a reduction in traffic volumes from that currently approved, a detailed Traffic Impact Assessment was not completed. The Blackwater Estuary is a Natura 2000 site and an assessment of the impact on this site is provided in the Natura Impact Statement (Appropriate Assessment), which is a separate document and not included in the EIS

1 INTRODUCTION

1.1 The Applicant

The applicant (ERAS ECO Ltd) operates a sludge management and waste recovery facility at Foxhole, Youghal, County Cork. The facility was commissioned in 2007. ERAS ECO Ltd was originally a joint venture between AVR and SWS, however since August 2009 EROS ECO Ltd has been solely owned by Ormonde Organics Holdings Limited (Ormonde Organics), Killowen, Portlaw, County Waterford.

Ormonde Organics is one of the largest organics and sludge management companies in Ireland providing services to many sectors, including local authorities, dairy, construction, industrial, pharmaceutical and manufacturing.

In addition to the Youghal facility, Ormonde Organics operates a Compost Facility in Portlaw, a Hazardous Waste Facility in Dublin, a Sludge Treatment Facility in Cavan and a Transport Depot in Kilkenny. Both Ormonde Organics and ERAS ECO Ltd have demonstrated their environmental, health & safety and quality performance by achieving full accreditation to the respective management standards, which include ISO 14001:2004 :OHSAS 18001:2007 and ISO 9001:2008.

1.2 Facility Overview

ERAS ECO Ltd was established to compensate for the lack of recovery facilities within Ireland. In particular its focus was the treatment of wastewater treatment plant (WWTP) sludges and the recovery of Commercial and Industrial (C&I) wastes.

In 2001, the planning permission was granted for the construction of a waste transfer station (Ref No. S/00/7093, 30th August 2001) and in 2005 permission was granted for the construction of a sludge treatment facility (Ref No. S/04/7531 04th February 2005). The Waste Licence was granted in November 2006 and the facility was constructed and commissioned in 2007.

The Waste Licence authorises the acceptance and treatment of a maximum of 30,000 tonnes/year of non-hazardous municipal sewage sludge and sludge from industrial WWTPs. The facility can also accept 70,000 tonnes of C&I waste and 10,000 tonnes of leachate. The total authorised capacity is 110,000 tonnes per annum, but the actual annual input is less than 10,000 tonnes.

The current site layout is shown on Drawing No 10P521-01. Sludge treatment has been on-going in Building No 2 since the facility was commissioned in 2007, however for commercial reasons the recovery of C&I waste, which was carried out in Building 1, stopped in 2009. The facility currently processes non-hazardous biological sludges from industrial and municipal sources. The processes, which are regulated by the Waste Licence include sludge drying and lime treatment.

The facility is authorised to treat landfill leachate, but this process has not yet started. The facility also accepts wood waste and woodchip from off-site waste recovery facilities as a fuel in the biomass boiler that supplies steam to the sludge dryer.

1.3 Proposed Changes

The shortfall between the volumes of waste authorised for acceptance and the amount actually taken in is due to a combination of a reduction in the volume of C&I waste arisings and customer requirements for a full service collection. The latter includes mixed waste containing putrescible materials, for example food stuffs. The current planning permission and Waste Licence do not allow the acceptance and processing of mixed waste. Therefore, it is proposed to accept mixed C&I wastes and also household waste, which is similar in composition (source segregated dry recyclables and mixed waste).

In addition to the household waste and the expansion on the types on C&I waste, ERAS ECO Ltd has identified opportunities to expand its waste recovery capacity, which includes the development of a new treatment process for the non-hazardous sludges and the treatment of hazardous wastes.

An Anaerobic Digestion (AD) Plant is proposed to treat the non-hazardous municipal and industrial WWTP sludges. The biogas (methane) produced by the system will be used to generate electricity and heat in a new Combined Heat and Power (CHP) plant. These new energy sources will be used on site, with surplus electricity sold to the National Grid. This will lead to an increase in the quantities of sludge accepted from 30,000 tonnes/year to 40,000 tonnes.

Currently, a significant volume of the hazardous wastes produced in Ireland exported for treatment/disposal. ERAS ECO Ltd has identified an opportunity to provide a treatment outlet for some of these wastes produced in the Cork Region by chemical and pharmaceutical manufacturers.

The wastes will be treated in an innovative physico-chemical treatment process-Superwater Critical Oxidation (SWCO) that has a treatment capacity of 30,000 tonnes/year. Storage tanks with a total capacity of 500m^3 will be provided to store the wastes awaiting treatment. Occasionally, the amount of hazardous arriving at the site at the same time may exceed the storage capacity. If this occurs, the road tankers in which the wastes are delivered will be temporarily parked in a new dedicated parking area before being sent to other recovery plants, either in Ireland or overseas.

Waste Types & Quantities

At present, ERAS ECO Ltd has approval to take in 110,000 tonnes of waste per year, which includes:

Commercial & Industrial Waste	70,000 tonnes
Non-Hazardous Sludge	30,000 tonnes
Leachate from Landfills	10,000 tonnes

The proposed changes will reduce the overall quantities of waste to 95,000 tonnes/year, which will include:

Commercial & Industrial and Household Waste	20,000 tonnes
Non-Hazardous Sludge	40,000 tonnes
Hazardous Waste	30,000 tonnes
Leachate from Landfills	5,000 tonnes

Proposed Layout

The proposed site layout is shown on Drawing No P521-02, and will involve the following changes to the existing site layout:

- Provision of 2 No AD Treatment Tanks (combined capacity 2208m^3) digester tanks immediately outside the Waste Recovery Building and a digestate storage tank at the southern site boundary. The waste acceptance, solids feeder and other associated AD (e.g. gas conditioning) will be located within Building 1.

- Provision of a new CHP plant adjacent to the AD digester tanks.

- Provision of the SWCO system in Building 2, with associated cooling towers, nitrogen storage tank and generator located outside the building.

- Provision of 1 No above ground liquid oxygen storage tanks to the north of and adjacent to the firewater storage tank, with option to provide an additional tank.

- Provision of 5 No 100m^3 waste solvent storage tanks to the north of the Building 2.

- Provision of an odour abatement system, once decided, at the southern side of Building 1.

- Provision of dedicated bunded storage area (459m^2) for road tankers containing hazardous waste, including an additional storage tank.

- Provision of an in-line Total Organic Carbon analyser of the surface water drainage system.

- Relocation of existing Chemical Store.

- An open air holding area (458.85 sq m) providing parking for vehicles/tankers/trailers during the sample testing period of hazardous waste contents prior to dispatching for treatment on-site or off-site;

2 WASTE PLANNING POLICY

2.1 Introduction

This Chapter describes the waste management policy statements and plans and other relevant environmental and energy policies that affect the facility, and describes how it is consistent with European Union (EU), national and regional waste management legislation, policies, strategies and plans.

2.2 National Waste Management Policy

National waste management policy is grounded on the Department of the Environment and Local Government's policy statement of September 1998, *"Changing Our Ways".* This statement firmly bases national policy on the EU Waste Management Hierarchy. In descending order of preference this is: -

- Prevention;
- Minimisation;
- Reuse;
- Recycling;
- Energy Recovery;
- Disposal.

The policy statement was based on, and supported by, EU legislation that requires the reduction in the volume of biodegradable waste disposed to landfill.

"Changing our Ways" recognised that the achievement of these targets requires the development of alternative waste recovery facilities and significant expansion of the existing recycling infrastructure. It emphasised the utilisation of the potential of the private sector to deliver services.

The 2002 government policy statement *'Preventing and Recycling Waste - Delivering Change'* identified initiatives to achieve progress at the top of the Waste Hierarchy in terms of preventing waste arising and increasing recycling rates. In further policy documentation 'Waste *Management – Taking Stock and Moving Forward' 2004*, the significant improvement in recycling and recovery rates achieved since 1998 were recognised, but the need for further expansion is emphasised. The statement confirms that Ireland's national policy approach remains *'grounded in the concept of integrated waste management, based on the internationally recognised waste hierarchy, designed to achieve, by 2013, the ambitious targets set out in Changing Our Ways'.*

The EU has adopted a framework (Waste Framework Directive 2008/98/EC) for coordinating waste management in the Member States in order to limit the generation of waste and to optimise

the organisation of waste treatment and disposal. The Directive also introduces the first EU wide recycling targets.

The Department of the Environment, Heritage and Local Government (Department) initiated a review of waste policy in 2008, with the objective of determining Irish waste management policy, including the role of local authorities and the private waste management industry. The scope of the review was to identify possible changes to policy at national level that would assist Ireland to move towards a sustainable resource and waste policy, including minimising the creation of waste and self-sufficiency in the reuse and recycling of materials. The review also sought to address how better to implement waste recovery in the context of the application of alternative technologies for waste management, which includes anaerobic digestion as part of an overall mechanical biological treatment (MBT) system

National Hazardous Waste Management Plan

The Waste Management Acts 1996 to 2010 requires the EPA to prepare a National Hazardous Waste Management Plan (NHWP). The primary objectives of the current NHWP 2008-2013 are:

- The reduction of hazardous waste produced by industry and society generally.
- To minimise unreported hazardous waste with a view to reducing the environmental impact of this unregulated waste stream.
- To strive for increased self-sufficiency in the management of hazardous waste and to reduce hazardous waste export.
- To minimise the environmental, social and economic impacts of hazardous waste generation and management.

The objective of striving for greater self –sufficiency in hazardous waste management, where this is technically and economically feasible (Section 6.2) is based on the the proximity principle established in the EU Waste Framework Directive and the need to reduce the export of hazardous waste.

The Plan states that there are two environmental benefits deriving from such a reduction. Overland and marine transport of hazardous waste is avoided, removing the potential for hazardous waste spillage on land and at sea in the event of an accident. It is also estimated that the treatment of a notional 100,000 tonnes of solvent waste in Ireland, as opposed to its export, would reduce transport-based greenhouse gas emissions by an estimated 88% - thus contributing towards implementation of Ireland's Climate Change Strategy.

Section 6.6 of the Plan describes a range of alternative treatment options for hazardous waste, which included Supercritical Water Oxidation and states that the Plan supports the provision of such technologies where they are technically and economically feasible.

Cork Waste Management Policy

Section 1 of the Cork County Waste Management Plan states that the Plan reflects government policy in waste planning, particularly in terms of favouring an integrated waste management approach and increasing participation by the private sector in the provision of services. The Waste Management Strategy for the Cork Region, on which the Plan is based and which spans the 25 years to 2020, commits the Cork Local Authorities to:

- Act to conserve and protect the environment and natural resources of the region.
- Provide a framework to address the region's growing problem of waste management in accordance with best prevailing norms, financial capacity and best environmental practice.
- Provide solutions for three main issues:
    - Expansion of recycling facilities.
    - Reduction of the volumes disposed in landfill through pre-treatment options.
    - Proper disposal to landfill of residues in accordance with EU and EPA requirements.

In relation to the management of hazardous waste, the Cork Regional Waste Management Plan recommends it be carried out in accordance with the NHWP.

In March 2000, Cork County Council adopted a Sludge Management Plan, which identifies different treatment solutions for the sludges generated in the county, including anaerobic digestion.

The proposed expansion of waste activities is consistent with the objectives of the Cork Regional Waste Management Plan and the Sludge Management Plan.

Cork County Development Plan 2009

It is a policy objective of the Plan (Policy Inf. 6-1) to: -

- Implement and support the provisions of the County Council's approved Waste Management Plan and in particular, to promote the development of facilities for the prevention, minimisation, re-use / re-cycling or disposal with energy recovery of waste material.

The proposed changes to the facility operations are consistent with regional waste policy objectives, as they will increase volume of materials recovered/recycled at the facility.

2.3 Energy Policy

In 2007, almost all (96.3 %) of Ireland's total energy consumption was generated from fossil based fuels (i.e. coal, oil & gas) and only 2.9 % was from renewables. EU Directive 2001/77/EC, requires Ireland to increase electricity produced from renewable energy sources from a level of 3.6% in 1997 to 13.2% by 2010. Potential energy sources, such as sludges, can be used to generate electricity to reduce both the reliance on imports and exposure to international markets.

In May 2010, the Government launched the Renewable Energy Feed In Tariff (REFIT) Scheme to encourage the growth of renewable energies, particularly AD, as part of a programme to meet the Directive's objectives. The scheme sets the tariffs that will be paid to AD fuelled Combined Heat & Power (CHP) plants over a 15 year period and in November 2010 these were submitted to the European Commission for approval under the state aid programme.

2.4 Climate Change

Under the Kyoto Protocol, Ireland is required to maintain its Greenhouse Gas (GHG) emissions to 13% above its 1990 levels in the period 2008- 2012. The National Climate Change Strategy charts the way to achieve the targets. The strategy promotes the development of low carbon technologies, such as bioheat and Combined Heat and Power, by industry as one of the key mechanisms of meeting the Kyoto targets.

2.5 Need for the Development

There is a need to expand the range of recovery options for biological wastes in the Cork Region, in particular in the area of energy generation from renewable sources. Anaerobic digestion of municipal and industrial wastewater treatment sludges, with the consequent use of the biogas to generate electricity and heat for use on site and sale to the national grid, meets this need.

Despite the national and regional policy objective of becoming self-sufficient in the management of waste, Ireland continues to be heavily reliant upon overseas facilities for the recovery or disposal of hazardous wastes. The 2008 National Waste Report published by the EPA, demonstrates Ireland's continued reliance on international outlets for the hazardous wastes being generated. In 2008, 157,256 tonnes of hazardous waste was exported, which represents approximately 49 % of the total hazardous waste generated in Ireland.

ERAS ECO Ltd has identified opportunities to meet both of these needs by biologically treating municipal and non-hazardous industrial WWTP sludges to generate heat and power and to provide a local treatment capacity for hazardous wastes arising in the Cork region. To achieve this, there is a need to expand the technologies deployed at the facility, which is the objective of the planning application.

3 ALTERNATIVES

3.1 Introduction

This chapter addresses the alternatives considered to locating the proposed activities at the Foxhole facility.

3.2 Alternative Locations

The original EIS involved an extensive survey of industry/enterprise zoned lands in Cork that were potentially suitable for waste activities. The subject site was considered suitable, based on the site selection criteria applied, which included proximity to waste sources, proximity to a developed transportation network, suitable zoning and compatible surrounding land use, distance from potential sensitive receptors and distance from historic sites and monuments.

The features of the site that render it particularly suitable for the proposed waste activities are:

(a) Proximity to Waste Arising:

The existing facility primarily serves pharmaceuticals industries located in the Cork region, which are the primary sources of the hazardous solvent wastes. Its location in east Cork is well positioned for this purpose.

(b) Access :

- Proximity to national road network – the facility is approximately 1.5 kilometres from the N25.
- Good site access – all vehicles delivering waste to the facility approach via the Rincrew roundabout and take the R634 towards Youghal. There is no need for waste vehicles to enter the town of Youghal. A newly reconstructed approach road off the R634 to the facility, NCT Centre and Youghal Landfill was completed in 2009.

(**c**) Layout:

- The site is relatively large (1.6 hectares) and the existing buildings have the capacity to accommodate the waste solvent treatment process.
- Existing services and infrastructure which will be retained – the site already has adequate electricity and water supply for the proposed developments.

(d) Location:

- Good separation distance from residential areas (approximately 250 m);
- Site does not interfere or encroach on any areas of scientific archaeological value

While the original site selection criteria apply equally to the treatment of solvent waste, additional factors have to be taken on board. The World Health Organisation (WHO) has issued guidelines

on exclusionary criteria for new hazardous waste treatment facilities. (Exclusionary Criteria for New Hazardous Waste Facilities, published by WHO 1993). Although intended for 'new build' facilities, and not directly applicable to the proposed development, these have been used to assess site suitability. The criteria with comments on the site specific conditions are:

Areas of unstable or weak soils:

The subject site is an existing facility almost entirely covered with reinforced concrete yard and buildings. There is no risk of landslip at the site.

Areas of subsidence:

The buildings have been designed and constructed to take account of the ground conditions and the risk of subsidence is negligible.

Areas of saturated soils

The buildings have been designed and constructed to take account of the ground conditions and the risk of subsidence is negligible. The site is entirely covered with buildings and hardstanding.

Areas of aquifer importance, for example where the water is of significant potential

The aquifer beneath the site is not important resource.

Areas prone to flooding

The site is not in an area prone to flooding.

Areas above sites where water is being or intends to be used

The aquifer beneath the site is not an important aquifer and there are no proposals to use it for abstraction purposes.

Areas of unfavourable atmospheric conditions, such as inversions which may inhibit the dispersal of contaminants.

The microclimate in the area is not subject to unfavourable atmospheric conditions.

Areas prone to natural hazards such as volcanic ash, seismic movements, etc.

The site is not in an area prone to natural hazards.

Areas of important natural resources such as endangered species or protected habitats
The site is not in an area of important natural importance.

Areas of land which are valuable from either an economic or cultural perspective

The site is located on reclaimed land and has low economic and cultural value due to the proximity to adjacency to the landfill.

Areas in historic locations or structures of archaeological importance

There are no historic or archaeological structure on the site.

Areas which are sensitive such as containing flammables and explosive materials

The area is zoned as industrial/commercial, however there are no significant users of explosive or flammables in the area. Landfill gas is produced at the nearby landfill, but the landfill operator provides comprehensive gas management and control measures.

Areas containing stationary populations such as hospitals

There are no hospitals or community facilities in the immediate area of the site

Areas of inequity or imbalance, for example where they are too many unwanted facilities

As the site is already an authorised waste activity and is adjacent to a non-hazardous waste landfill, the proposal will increase the range of waste activities that will be carried out, but will not add to the total number of waste operations.

Conclusion

The site is suitable for its current use, which is compatible with the proposals to increase the volumes of non-hazardous sludge that will be treated and to accept household and C&I mixed waste. The Aquacritox system has been proven at a pilot scale in Ireland, but what is now proposed is a full scale plant that will have a capacity to treat up to 30,000 tonnes of hazardous waste/year. The only alternative open to ERAS ECO Ltd is to develop a new facility solely for the treatment of hazardous waste at a separate location. Given the acquisition and development costs, this is not economically feasible.

3.3 Alternative Processes

Anaerobic Digestion

The digester will comprise a solids feeder and digestion tank, which will be enclosed by an impermeable cover and heated to 37^{O}C. The tank will be continuously stirred and fed with sludges. This process will produce a biogas containing approximately 65 % methane, which will then be treated and used as a fuel in the CHP plant. As the proposed system is tried and tested,

and is particularly suited to the treatment of sludges and the generation of biogas, an alternative was not considered.

Hazardous Waste Treatment

The proposed Aquacritox SCWO process converts all organics and toxic materials to carbon dioxide, water and nitrogen and as such is considered to be Best Available Technique (BAT) for hazardous waste management. The process is designed to treat those hazardous wastes that cannot be reused in the production process at the facilities where they are generated and will compete with incineration, which is the only alternative treatment for the target wastes.

3.4 The Do-Nothing Alternative

The following considers each of the proposed changes and the impact of not progressing with each element.

Mixed C&I and Household Waste

If the mixed C&I and Household Wastes are not accepted ERAS ECO Ltd will not be able to develop and expand a dry recyclable recovery business. This will have adverse negative economic consequences for ERAS ECO Ltd and prevent the expansion of competition in waste market in the Cork Region, which is of benefit to the waste producers.

Anaerobic Digestion

If the AD system is not installed, ERAS ECO Ltd will continue to rely upon an external electricity supply (i.e. national grid) and will not avail of the renewable energy potential of the wastes it is currently handling. The facility's carbon footprint will remain unchanged, with no contribution to the reduction in greenhouse gas emissions.

Hazardous Waste Treatment

The EU Waste Framework Directive recommends that waste for disposal shall be treated in the nearest appropriate sites, by the most appropriate treatment method and technology. It is an objective of the NHWP that hazardous wastes be treated in Ireland rather than exported. Not proceeding with the hazardous waste treatment plant will adversely impact on progress towards self sufficiency in hazardous waste management.

4 SITE DESCRIPTION

4.1 Introduction

This Chapter presents an overview of the facility and the surrounding area. More details on various aspects of the facility and operations are presented in the following Chapters.

4.2 Location

The site is located off the R634 (former N25 Cork to Waterford Road) at National Grid Reference 2097E, 7977N. The site area is approximately 1.6 hectares in extent, comprising waste processing buildings, offices, wastewater treatment plant and open yards. It is in an area zoned for industrial use and is adjacent to the Youghal Landfill.

4.3 Surrounding Landuse

A local road runs along its northern boundary, while south of the site is mudlands. To the east of the site, between it and the Youghal Landfill and civic amenity centre operated by Cork County Council, is a small plot of land owned by Youghal UDC. The adjoining lot to the west is occupied by the National Car Test (NCT). The nearest private dwelling is 250m from the site, at the junction of the site access road and the R634.

The surrounding lands have a variety of commercial uses including Cork County Council's Youghal Landfill and Civic Amenity Site, the Youghal NCT Centre, the Foxhole IDA Industrial Estate and the Foxhole Business Park.

4.4 Site Layout

The existing site layout is shown on Drawing No P10531-01. The main features of the facility are as follows:

- Administrative Office Building
    - Canteen;
    - Public Information Room;
    - Toilets & Changing Rooms;
    - Laboratory;
    - Other Offices: Weighbridge/ Main Office/ Control Room; Facility Manager.

- Building 1
    - Designated Wood Waste Area;
    - Designated Biomass Storage Area;
    - Workshop.

- Building 2
    - Biomass/ Woodchip Storage Area;
    - Sludge Reception Area;
    - Sludge Drying Area.

- WWTP

    - Balance Tank;
    - Culligan Filters;
    - Carbon Filters;
    - Hypochlorite Mixing Tanks;
    - Other Tanks: Treated Water; Washwater; Sludge,

- Transformer Building
- Above Ground Fire Water Storage Tank
- Underground Stormwater Retention Tank
- Car parking area,
- Weighbridge & Wheel Wash
- Perimeter Fencing
- Ancillary features including roads, sewerage and surface water drainage, hardstanding open yards, bunded chemical and fuel storage areas and back up generator.

4.5 Existing Plant, Equipment & Services

The existing plant, equipment and services include:

- Sludge Reception Bins with hydraulic doors;
- VOMM Sludge Drying Unit, including cyclone, bag filter, scrubber and cooling system;
- 4MW Uniconfort Biomass Boiler including cyclone and bag filter;
- Quick opening/closing roller shutter doors;
- Sprinkler system connected to Building 2;
- All buildings connected to fire alarm;

- Telecommunications infrastructure;
- Mains water supply;

4.6 Existing Drainage System

Surface Water

The existing drainage layout is shown on Drawing No P521-05. Stormwater from roofs and non-waste storage hardstanding areas is collected in the facility drainage system and discharged into a municipal surface water sewer to the northeast of the site via a non-return valve. The municipal sewer discharges into the estuary to the east of the site. Before discharge from the site, all run-off passes through two silt/ oil interceptors (Class 1 and designed in accordance I.S. EN 858) and a stormwater retention tank. The outfall from the tank is regulated by a pH meter.

Wastewater

The drainage layout is shown on Drawing No P521-05. Wastewater generated at the site includes sanitary wastewater from the offices and process water from the sludge drying unit. The sanitary wastewater is initially treated in the proprietary treatment system (Puraflo©) before being discharged to the municipal sewer controlled by Youghal Town Council. This Council sewer discharges to the estuary, however the Council intends to connect this sewer to the new municipal wastewater treatment plant for Youghal, when this is commissioned.

The process wastewater is also discharged to the WWTP and the treated effluent is discharged to the estuary. The quality limits and flow rate of the discharge are specified in the Waste Licence. ERAS ECO Ltd monitors the effluent quality and report the results to the EPA.

In November 2010, due to problems complying with the emission limits, the EPA instructed ERAS ECO Ltd to stop discharging the treated effluent to the estuary. ERAS ECO Ltd immediately complied with the instruction and initiated a remedial action programme, which has been approved by the EPA. The programme includes pH adjustment, provision of a dissolved air floatation unit (DAF), replacing carbon filter medium and use of harvested rainwater to backwash filters. There is sufficient on-site storage capacity for the wastewater generated at the facility pending the completion of the remedial works.

In the longer term, the intention is that the treated effluent will be discharged to the municipal sewer when the new Council wastewater treatment plant serving Youghal Town is operational.

4.7 Existing Waste Activities

Sludge Treatment

The treatment processes comprise reducing the moisture content and pasteurisation using either a biomass fuelled drier, or the addition of lime. The incoming sludges are weighed and samples collected for testing in the on-site laboratory. The sludge, which has a minimum Dry Solids (DS) content of 10%, is then directed either to Building 2 for treatment, or to Building 1 for temporary storage pending treatment.

At the sludge drier, the sludge is tipped into reception bins (covered with hydraulic lids and gratings) from where it is pumped to a dosing / mixing bin. From the bin, it passes into a dryer, which is heated using steam generated in a biomass (woodchip) fired boiler. The woodchip is stored in Building 1.

The building is fitted with interlocked rapid roller doors providing efficient containment of odours within the building. The steam from the drier is ducted to a scrubber/separator, where it is condensed. Any fine particulate matter is returned to the dryer and the condensed effluent is sent to the on-site WWTP where it is treated before discharge.

The purged steam and volatile organics evaporating from the WWTP and odorous air from the sludge reception bin, which is fitted with a system that extracts the air from the hopper, are ducted to a biofilter odour abatement system. The extraction system provides negative ventilation to the area handling the sludge (i.e. where odours are generated).

The dried sludge is then transferred to a product cooling conveyor. The product, which has a moisture content of less than 20%, is then screened to separate the fines, which are returned by the fines conveyer to the front of the dryer. The end-product is a sterilised granulated material suitable for use as a fuel. Presently this dried sludge (~ 1100 tonnes per annum) is exported to a licensed recovery facility in Germany.

The sludge drier runs on a 24 hour basis, 7 days a week including holidays. It is shut down for regular maintenance. Deliveries are between 7.00 am and 10.00 pm, Mondays to Fridays, and on Saturdays between 7.00 am and 2.00 pm.

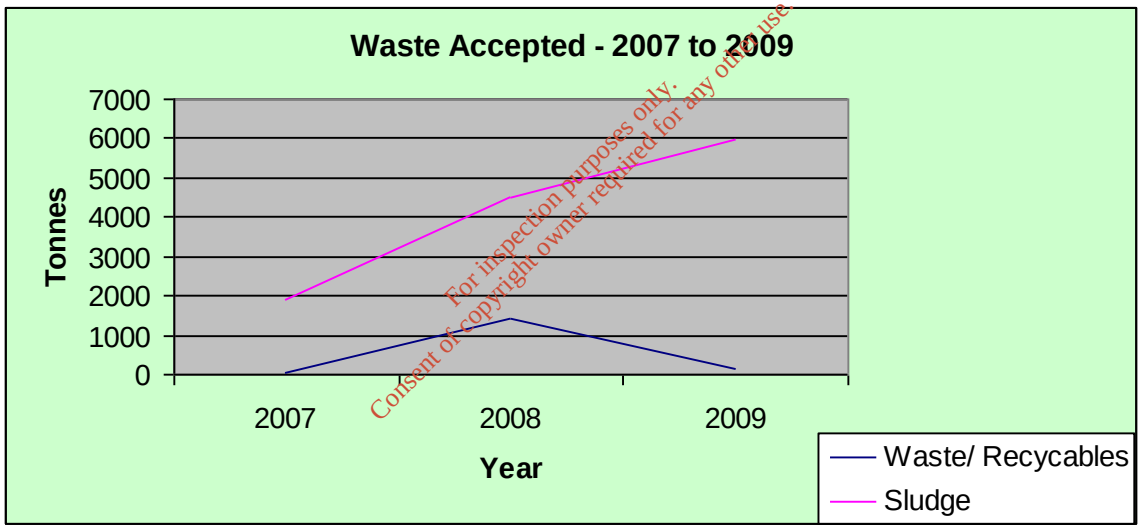
In addition to the drier, sludge can be treated by the controlled addition of lime using a fully enclosed auger. The lime reacts with the moisture in the sludge, raising the temperature and the pH. The odorous air is collected and treated in an odour abatement system. The dried sludge is sent off site and landspread on agricultural lands in accordance with best agricultural practice. Further information can be found in *Landspreading Handled/Managed Sludge on Agricultural Landbanks* (Ormonde Organics 2010, unpublished)

This was originally carried out in Building 1, but was stopped in 2009 for commercial reasons. It involved the acceptance of source segregated (paper, plastic, cardboard, metals) and mixed dry recyclables. The source segregated materials were baled. The mixed dry recyclables were manually sorted and then baled. All of the materials were sent off site for further treatment and recovery.

4.8 Current Waste Acceptance Rates

Current planning permission and Waste Licence authorise the acceptance of up to 110,000 tonnes of waste annually. The quantities of waste accepted at the facility since it opened in 2007 are shown on Figure 4.1. While the volumes of sludges increased, the C&I waste declined to a level that was not commercially sustainable.

Figure 4 1 - Waste Tonnage 2007 - 2009



5 PROPOSED DEVELOPMENT

This Chapter describes the proposed changes to the facility operations. It provide details of the waste handling, treatment and support activities and also outlines the control measures incorporated into the facility design and operation to eliminate and/or mitigate environmental impacts. Further information on the control measures are provided in the following chapters.

5.1 Site Development Works

The proposed changes will involve changes to the site layout which will include the construction of AD digester tanks a digestate storage tank and the installation of addition odour abatement system. The Aquacritox system will be housed inside Building 2 and will not require any alterations to the building structure; however, ancillary cooling towers, oxygen and nitrogen storage tanks will be installed outside the building. Above ground solvent waste storage tanks along with a road tanker parking area will be provided.

Minor excavation work may be required for the foundations of the digester tanks and to install the drainage serving the road tanker parking areas

The existing concrete yard will be retained and used as a base for a new fibre mesh reinforced concrete slab in the road tanker parking area. The parking area will be surrounded by a 2m high reinforced concrete wall, with a 450mm high reinforced concrete raised traffic bump.

Runoff from the bunded area will be collected in a new drainage system which will connect to existing surface water drainage system. An automated butterfly valve will control a new Total Organic Carbon meter installed at the existing stromwater retention tank.

5.2 Anaerobic Digestion

The fully enclosed AD system will be capable of processing up to 20,000 tonnes per annum of non-hazardous industrial sludges. Two (2 No) purpose built anaerobic digesters will be constructed adjacent to Building 1 and an above ground digestate storage tank will be provided at the southern site boundary.

Non-hazardous sludges will be delivered to the Waste Recovery Building, where they will be off loaded directly into a feeder hopper and then transferred via a fully enclosed conveyor, to the tanks, each of which will be maintained at 37^{O}C.

The AD process produces a biogas, fibre and liquor. The biogas will comprise largely methane and carbon dioxide, but will also contain a small amount of hydrogen sulphide and ammonia, as well as traces of other gases. The biogas will be treated before being used as a fuel in an on-site CHP plant, which will produce heat and electricity that will meet on-site energy needs or exported to the national grid. The fibre will be treated in the sludge drier and the liquor will be recirculated to the digesters and, where necessary, treated in the on-site WWTP.

5.3 Hazardous Waste Treatment

The Aquacritox® Super Critical Water Oxidisation (SCWO) process was developed to destroy organic waste and generate renewable energy. SCWO uses water at high temperatures and pressures to destroy toxic and hazardous organic wastes, such as waste solvents. It can also treat wastewater treatment sludges. The process uses an oxidant (oxygen) in water at pressures and temperatures above the supercritical point of water (221bar and 374^{0}C to completely convert the organic compounds in to carbon dioxide, nitrogen and water.

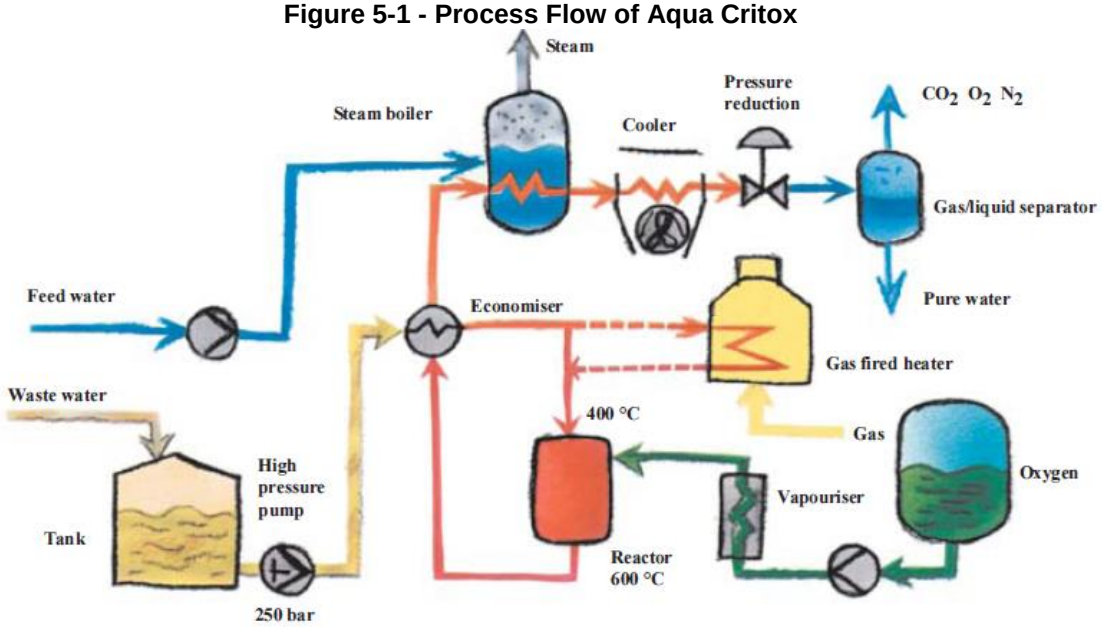
The process is exothermic at 3% organic content and can handle up to 30% organic content. The excess heat can be used to generate electricity.

The Aquacritox unit will be installed within Building 2. The typical process flow of the Aquacritox system is shown on Figure 5-1. The feed stock will be pumped to a feed tank pressurised to 250 bar. The feed will enter an economiser, where it will be preheated by the reactor effluent.

At start-up, and when low heat value waste is treated, the waste will be heated up to about 400 ^{o}C by a pre-heater. The hot feed will enter the reactor, where oxygen will be added. The oxidation reaction increases the temperature to around 600^{0}C. Complete destruction is achieved in about 1 minute. From the reactor the effluent will be pumped to the economiser and a heat recovery system, such as a steam boiler.

The effluent will then be cooled to below 100^{0}C prior to pressure let down and gas/liquid separation. The gas stream will comprise carbon dioxide, oxygen and nitrogen and will not require further treatment. An in-line continuous analyser will monitor the quality of the emission to air. The effluent will be sterile and of high quality and may be recycled as process water or polished and used as a boiler water feed. The treatment of wastewater treatment plant sludges will also produce an inert solid residue.

Figure 5-1 - Process Flow of Aqua Critox



The Aquacritox Plant will be capable of achieving in excess of 99.99% Chemical Oxygen Demand (COD) destruction of the solvent waste. To achieve this reduction, the process will consume significant oxygen input, as the oxygen consumed per m^3 of feedstock is directly proportional to the COD of the waste stream + 10%. More detail on the process is included in Appendix 2

Occasionally due to the amount of wastes arriving at the site, it may not be possible to treat all of the waste on-site. As part of the overall waste management service provided by ERAS ECO Ltd to its customers, such wastes will be temporarily stored on site in the transport tankers prior to dispatching for treatment off-site for treatment/disposal. The proposed layout of the tanker storage area is shown on Drawing No P521-02.

5.4 Municipal Solid Waste

Municipal Solid Waste (MSW), comprising C&I and Household waste will be accepted. The MSW will comprise source segregated dry recyclables and mixed residual waste. The dry recyclables will be of a similar type to the C&I wastes currently approved (paper, plastic, cardboard, tetrapak, cans etc). The residual waste will include putrescible wastes for example foodstuffs.

All the wastes will be handled in Building 1. The dry recyclables will be handled in the area designated for the C&I waste. The residual mixed waste will be handled in a separate designated area that will be provided with an odour control system comprising air extraction and ducting to a carbon filter that will be positioned outside the western wall of the building. The residual mixed waste will not be processed on-site, but will be bulked up for transfer from the site on the same day as arrival.

5.5 Waste Handling

The existing facility is designed and authorised to handle/treat sludges and recover solid C&I waste. The proposed changes will reduce the quantities of waste that are currently approved, and change the waste recovery processes, with a knock on effect for handling procedures.

Waste Acceptance Procedures

ERAS ECO Ltd already has strict procedures in place for the acceptance and processing of incoming wastes; the proposed new waste activities and streams (i.e. anaerobic digestion of sludges; acceptance of hazardous wastes for either temporary storage prior to offsite disposal/recovery) will include the following acceptance procedures;

Designated staff members operating the weighbridge system (WIMS) log all waste loads arriving at the site and the following information is recorded:

- Description of the waste including waste types (e.g. Sewage Cake)., and relevant European Waste Catalogue (EWC) codes;
- The origin of the waste, including all customer details;
- Haulier Details;
- Vehicle Registration;
- Driver Name; and
- The weight of the waste load.

Upon leaving the weighbridge, all waste delivery vehicles will be directed to the appropriate off-loading or temporary storage points, where the materials will be inspected. If staff members are satisfied that the load is acceptable it will be tested and processed as required. Any loads considered to be suspect will be removed to a dedicated Quarantine Area inside Building 2 for further inspection. If the inspection identifies the materials do not meet the relevant acceptance criteria, the staff will arrange for the load to be returned to the producer.

6 SOILS & GEOLOGY

6.1 Introduction

This Chapter describes the soils and bedrock conditions at the site. The information is derived from a report prepared by Hydro Environmental Services (HES), which was based on a desk study of available information, including reports on previous site investigations, and a walk over survey. The full HES report, which describes the data sources and methodology applied, is included in Appendix 3.

6.2 Subsoils

The available geological maps indicate that the soils in the vicinity of the site include deep mineral (AminDW) and marine, which are associated with the estuary of the Blackwater River (Estuary) to the east of the site. Deep well drained mineral soil is present to the west of the site. The subsoils underlying the site comprise made ground, which is consistent with the historical reclamation of land within the Youghal Mudlands. The natural subsoils include marine sands in the vicinity of the estuary and sandstone tills further west of the site.

Data from site investigations carried out at the site in 2004 and 2007 confirms the geological mapping and shows the site is underlain by up to 3m of made ground, which overlies more up to 11.6m of glacial till, which in turn overlies up to 2m of sandy gravel. The made ground was predominately clay, with small portion of construction and demolition waste. At the time of the investigations, the site was used by the operator of the neighbouring landfill and contained a diesel storage area, which was located in the vicinity of the current site entrance.

6.3 Bedrock

The bedrock underlying the site consists mainly of the Waulsortian Limestones. This formation consists of massive, unbedded mounds of calcareous deposits in the form of mudstones, wackestones and packstones. Bedrock was not encountered in the 2004 and 2007 investigations, but based on the proven thickness of the subsoils, is more than 12m below ground level. Devonian rocks which are situated to the north and south of the site include the Ballysteen and Gyleen Formations, part of which is referred to as the Old Red Sandstone. Synclinal folding associated with the Variscan orogeny means that these limestones are surrounded on all sides by progressively older rocks.

6.4 Impacts of Proposed Changes

The economic importance of the soils and geology underlying the site is “Low”. The proposed changes to the site layout will involve minor excavation works for the foundations of the AD tanks and the installation of drains from the tanker parking area. There is the potential for leaks from the drainage system serving the road tanker parking area to escape to ground via damage to the pipework.

6.5 Mitigation Measures

Due to the hazardous and potentially corrosive characteristics of the waste transported in the road tankers, the pipework between the collection sump in the bunded area and the discharge manhole will be fabricated using stainless steel. This will prevent corrosion and leakage of pipes into the future. Rainwater run-off that collects in the sump will be tested in the on-site laboratory to ensure it is suitable for discharge to the surface water drainage system. If contamination is detected, the water will be sent to the Aquacritox system for treatment.

7 WATER

7.1 Introduction

This Chapter describes the surface water and groundwater regimes at the facility. The information is derived from a report prepared by HES, which was based on a desk study of available information, including reports on surface water and groundwater monitoring, and a walk over survey. The full HES report, which describes the data sources and methodology applied, is included in Appendix 4

7.2 Surface Water Catchment Area

The site is in the catchment of the Blackwater River, which enters the sea at Youghal Harbour approximately 4km southeast of the site. The Blackwater River and Estuary is designated a Special Protected Area (SPA), a proposed National Heritage Area (pNHA) and a Special Area of Conservation (SAC). Surface water characterisation undertaken under Article 5 of the Water Framework Directive has assigned the surface water catchments of the Tourig River a "Good" status. The surface water catchments to the Blackwater, which are numerous, generally fall into the "Moderate" to "Poor" status.

The flood risk records maintained by the Office of Public Works (OPW) contain reports of flooding in the area of the Youghal Mudlands, associated with ditches that drain the Mudlands area to the south of the site. The reports indicate that flooding was primarily caused by extreme high tides combined with wind surges. There is no record of any flooding at the ERAS ECO Ltd site.

7.3 Groundwater

The Geological Survey of Ireland (GSI) has classified the Dinantian pure unbedded limestones which underlie the site as a Locally Important Karstified Aquifer. The pure unbedded limestones of the South Munster region are generally highly productive (GSI, 2004). Faults and joints were enlarged by karstification as groundwater moved through the limestones (GSI, 2004).

A search of the GSI well database identified one well used for water supply within the aquifer. A yield of 979m^3/d was reported for this source. This well is located approximately 5km west of the site (*i.e.* up-gradient). This would be considered an excellent well in terms of water supply. A

search of the GSI karst database indicates that there are no karst features within the area of the site.

Groundwater levels at the site were determined from 3 no. on-site monitoring wells. Groundwater levels at the site varied between 1.15m below ground level (mbgl) and 4.07mbgl. The levels suggest that the groundwater flow direction in the superficial deposits is to the southeast beneath the site towards the estuary. The steep gradient (*i.e.* difference in water levels from up-gradient to down-gradient wells) may also indicate a perched water table within the superficial deposits.

The vulnerability of the aquifer underlying the site is rated as predominately "High" by the GSI However, investigations at the site encountered up to 11.8m of stiff glacial CLAY till beneath the site. Therefore, based on GSI criteria the groundwater vulnerability at the site can be rated as Moderate to Low.

Groundwater monitoring is carried out at the site biannually in the three on-site wells (MW-1, MW-2 and MW-3). Based on the measured groundwater levels, MW-2 and MW-3 are up-gradient within the site and MW-1 is located down-gradient. The wells contain shallow (P2) and deep (P1) piezometers that monitor quality in different water bearing formations

In 2009, diesel range organics and petrol range organics were recorded in MW2 (P2). This indicates a shallow source of contamination up-gradient of the site. Cadmium was detected in MW1(P2) and MW2(P2) at concentrations exceeding the EPA Interim Guideline Value (IGV). This indicates again that contamination is within the made ground. The highest concentration of 60µg/l was recorded in MW-2(P2) which is up-gradient within the site. Other exceedances include ammonia in MW (P2).

Iron and manganese were elevated in most wells and this is potentially due to the background geology of the area and the estuarine environment. Chloride was also elevated compared to IGV values, and this is also likely due to the proximity of the site to the estuary which is tidal. The groundwater results indicate the presence of contamination within the made ground in the vicinity of the site. The background groundwater quality within the area of the estuary is naturally poor due to saline intrusion and would be significantly below drinking water standards.

7.4 Receptor Sensitivity

The aquifer underlying the site is classified as a Locally Important Aquifer and therefore can be considered a sensitive receptor. However, the groundwater quality within the area of the estuary is naturally poor due to saline intrusion and is therefore not a suitable source of potable water. There are no mapped source protection zones within the vicinity of the site. There are no water supply wells recorded within the reclaimed estuarine area. All recorded water supplies are located more than 4km up-gradient of the site. There are no down-gradient wells as the estuary is adjacent to the site. Due to the designated status of the Blackwater Estuary it can be considered very sensitive.

7.5 Site Drainage

There are no natural drainage features within the site boundary. Outside the site boundary, a drainage ditch runs adjacent to the site access road to the northwest of the site. This ditch receives runoff from the access road and from reclaimed land to the northwest of the site. Several other minor drains exist to the east and southeast of the site. All ditches drain into the estuary.

Surface Water

Stormwater from roofs and non-waste storage hardstanding areas is collected in the facility drainage system and discharged into a municipal surface water sewer to the northeast of the site via a non-return valve. The municipal sewer discharges into the estuary to the east of the site. Before discharge from the site, all run-off passes through two silt/ oil interceptors (Class 1 and designed in accordance I.S. EN 858) and a stormwater retention tank. The outfall from the tank is regulated by a pH meter. The quality of discharge from the site is visually inspected daily and tested quarterly at one monitoring location. The monitoring conducted in 2009 and 2010 determined that the quality of the discharge was satisfactory.

Wastewater

Wastewater generated at the site includes sanitary wastewater from the offices and process water from the sludge drying unit. The sanitary wastewater is initially treated in the proprietary treatment system (Puraflo©) before being discharge to WWTP. The process wastewater is also discharged to the WWTP from which the treated effluent outfalls to the estuary.

The Waste Licence sets a maximum discharge rate of 170m^3/day (7m^3/hour) and also specifies the quality limits. The discharge is subject to routine monitoring. Due to an inability to consistently meet the quality limits, the discharge to the estuary stopped in November pending improvements to the WWTP, which were on-going at the time of the preparation of the EIS.

7.6 Impacts of Proposed Changes

The existing surface water drainage system operates satisfactorily and there have never been any flooding problems either within, or outside the site boundary. The only discharge to the stormwater sewer is rainfall. As it is not proposed to increase the total paved areas, there will be no increase in the hydraulic loading on the storm sewer. It is proposed to introduce rain water harvesting through the collection of run-off from the building roofs. This will, in the long term, significantly reduce the hydraulic loading on the storm sewer.

Site activities with the potential to impact on surface water quality if uncontrolled, include: -

- Run-off from open yard areas,

- Spills and leaks.

Run-off from the yards areas could potentially contain silt and small amounts of oils from minor leaks from road vehicles and the mobile plant. Run-off from the open yards, including the new digesters, oxygen tanks and proposed tanker storage area is and will be collected and directed to on-site silt traps and oil interceptor.

The volume of oils, anti-freeze, detergents and disinfectants stored at the facility are kept to the minimum required for continued operation. These materials are stored in a designated bunded area. Spill containment kits are provided and maintained on-site and facility personnel are trained in the proper use of the kits to contain and clean up any major spills that occur

The proposed changes do not require the amendment of the existing emission limits and discharge rates for the treated effluent from the WWTP. All process wastewater will continue to be treated in the WWTP, which is currently being upgraded to ensure it achieves consistent compliance with the discharge quality limits.

The Aquacritox system will be a new source of wastewater. Details of the quality of the wastewater from the Aquacritox process are presented in Table 7.1, which includes for comparative purposes, the current emission limit values set in the Licence. The proposed discharge rate will range from 1 – 7m^3/hr, with a typical rate of 3.5m^3/hr, which can be accommodated within the existing authorised discharge rate of 170m3/day.

Table 7.1: Proposed Discharge Parameters & Concentrations.

Parameter	Existing Emission Limit	Aquacritox Effluent
	mg/l	mg/l
COD	125	<85
Suspended Solids	35	<30
Total Nitrogen	10	<8
Sulphate	100	<90
Ammonia	0.5	<0.5
Phosphorus	1	<1.0
Cyanide	0.01	<0.01
	µg/l	µg/l
VOC	50	<40
Lead	5	<4
Zinc	100	<90
Copper	30	<25
Cadmium	5	<4
Arsenic	20	<16
Chromium	15	<15
Nickel	25	<25

7.7 Mitigation Measures

The likely impacts of the proposed changes and mitigation measures that will be put in place to eliminate or reduce them are shown in Table 7.2 and 7.3.

Table 7.2 Potential impacts (PI) during the Construction Phase

	Hazard / Source and character of potential impact	**Pathway**	**Receptor**	**Potential Impact on hydrology** (refer to Tables 6.1 to 6.4 of the Geology Section for definition of impact descriptors)	**Proposed Mitigation Measures**	**Residual Impact**
H 1	**Potential impact on local groundwater quality resulting from spillages during the construction phase.** Accidental spillage during construction phase work (*i.e*. petroleum hydrocarbons or other construction chemicals).	Surface runoff, infill and soil pore space	Ground water	Negative, direct, slight, low probability impact on groundwater quality.	The existing site is completing overlain in hardstanding comprised of reinforced concrete. All construction work will take place on the existing hardstanding areas and there will be no exposure of the underlying soil. The site is completely kerbed and there will be no fugitive runoff from the site. Fuels or chemicals required during the construction phase will be bunded, therefore preventing leakages into hardstanding areas.	Negative, direct, slight, low probability impact.
H 2	**Runoff from hardstanding areas to surface water bodies during the construction phase** Release of surface runoff which potentially could contain contamination from construction products such as hydrocarbons and solvents.	Discharge routes to surface water	Surface waters and dependant ecosystems	Direct, negative, moderate, short term, low probability impact.	All runoff from the site is currently directed to the stormwater attenuation tank and hydrocarbon interceptor prior to discharge from the site. During construction additional inspections of the drainage system will be carried out. Any fuels or chemicals that are required during the construction phase will be placed over plastic spill trays, therefore preventing leakages into the stormwater system.	Negative, imperceptible, short-term, low probability impact on surface waters

Table 7.3 Operational Phase

	Hazard / Source and character of potential impact	Pathway	Receptor	Potential Impact on hydrology	Proposed Mitigation Measures	Residual Impact
H3	**Groundwater contamination** Contamination of groundwater underlying the site due to leakages from bunded areas and surface water drainage systems.	Cracks in existing concrete areas and surface water drainage routes	Groundwater	Negative, moderate, direct, low probability impact on groundwater	The site is located in an area with a groundwater vulnerability rating of low to moderate. Stiff clayey tills were noted to be up to 11.8m in thickness beneath infill. This layer in turn is then covered by infill and concrete. Therefore, the site in its current condition means the risk to groundwater is low. Design measures to prevent accidental leaks of waste include: 1. To contain spillages within the bunded area it is proposed that a reinforced concrete slab will be poured over the existing concrete hardstanding area. This will rule out any potential leakages that may have occurred from cracks within the existing hardstanding concrete. 2. Runoff from the waste acceptance area will be prevented by the construction of a 2m high concrete wall. Access to the bunded area will be guarded by a 450mm concrete ramp which will also prevent runoff leaving the bunded area.	Direct, imperceptible, low probability, long term impact on groundwater.

					3. Due to the hazardous and corrosive characteristics of the waste it is proposed that pipework between the collection chamber and the discharge manhole is fabricated using stainless steel. This will prevent corrosion and leakage of pipes into the future. Only non-hazardous runoff will be allowed continue into the existing surface water drainage system. This will be determined by on-site analysis. 4. Monitoring and maintenance measures: It is proposed that twice yearly inspections will be carried out by suitably qualified engineers and written certification be recorded of these inspections to ensure the bunded area remains fit for purpose. 5. Maintenance of the TOC and butterfly valve should conform to their respective manufacturers' specifications. The TOC sensor contains perishable material that will need to be changed at regular intervals in addition to general maintenance as required. 6. Regular monitoring of groundwater quality up-gradient and down-gradient of the hazardous waste operation which will indicate if leakages into the underlying soils are occurring. This will be done as part of the waste licence.	

					7. There are no known drinking water supply wells located with close proximity to the site. All recorded wells are significantly up-gradient of the site, and therefore cannot be impacted by the development. The groundwater in the area is generally of poor quality which is primarily due to the location of the site on land reclaimed from the estuary. The local groundwater is unlikely to be suitable for potable drinking supply.	
H4	**Potential impact on the quality of the Blackwater Estuary and Youghal harbor.** It is proposed that effluent from the hazard waste treatment technology will be routed through the existing waste water works and released as per the existing Waste Licence and discharge point.	Discharge route	Down-stream Surface and estuarine waters	Negative, moderate, direct, medium probability impact on surface water.	It is proposed that there will be no amendments to the current emission limits as set by the waste Licence. Based on specifications from the manufacturer, the effluent from the proposed Aqua Citrox technology will be of a high quality that is well below the existing discharge limits. It is proposed that the quality of the final discharge from the development will be improved when mixed with the effluent from the Aqua Citrox technology.	Neutral, direct, slight, high probability impact on surface and estuarine waters.

H5	**Potential of flooding down-stream of site due to run-off from hardstanding areas.**	Discharge routes	Down-stream Surface and estuarine waters	Negative, slight, direct, low impact on surface water.	The proposed development will be constructed on the existing hardstanding area. There will be no increase in site hardstanding area.	Neutral.

8 CLIMATE

8.1 Introduction

This Chapter describes the climate at the facility and is based on meteorological data obtained from the Cork Airport Meteorological Station.

8.2 Meteorological Data

The climate in the area can be described as mild and wet, with the prevailing wind direction from the south west. Average rainfall, temperature, humidity and wind speed and direction for the Meteorological Station at Cork Airport is presented in Table 8.1.

Table 8.1 Meteorological Data: Cork Airport

Rainfall	
Annual average	1207 mm
Average maximum month (Jan)	148.3 mm
Average minimum month (July)	65.4 mm
Temperature	
Mean Daily	9.4°C
Mean Daily Maximum (July)	18.5°C
Mean Daily Minimum (Feb)	2.5°C
Relative Humidity	
Mean at 0900UTC	87%
Mean at 1500UTC	77%
Wind (Knots)	
Frequency of calms	0.6%
Prevailing direction	South West
Prevailing sector	South West

8.3 Impacts of Proposed Changes

The proposed changes to operations will not result in any impacts on the climate or microclimate at the site. The reduction in reliance on non renewable sources of electricity due to on-site generation using the biogas will have a positive impact in reducing the facility's overall carbon footprint

9 TRAFFIC

9.1 Introduction

This Chapter describes the existing traffic conditions and the impacts of the proposed expansion of waste activities. It is based on the extensive Traffic Impact Assessment completed in 2004 for the original planning permission, which was based on an annual waste input of 110,000 tonnes. The proposed changes to site operations will not result in any increase in the quantities of waste accepted

9.2 Road Network

There are two separate entrances to the facility on the T12 road which connects with the R634; one entrance for waste vehicles (weighbridge entrance) and one entrance for cars.

The T12 section of road was originally part of the old Youghal – Dungarvan route. The T12 is approximately 370 metres in length from the junction with the R634 to the entrance of Youghal Landfill. In 2008 – 2009, the T12 was upgraded by resurfacing, relining, fencing and the installation of a pathway.

Today the T12 is a 50km/hr road serving the Commercial & Industrial zone in Foxhole, including:

- Walsh Engineering
- D. Walsh Auto Garage
- NCT Centre
- ERAS ECO Ltd and
- Youghal Landfill

Surrounding Road Networks & Proposed Road Schemes

The main road in the vicinity of Youghal is the N25, which is a national primary road connecting Cork to Rosslare and forms part of the E30 European route. In 2006, the National Roads Authority (NRA) oversaw the realignment and widening of a stretch of the N25 east of Youghal. The NRA are also assessing new routes, which affect/ connect with Youghal, which include:

- Carrigtwohill to Youghal – this 21 km starts between Carrigtwohill and Midleton and finishing at the Waterford end of the Youghal Bypass. Presently further work on this plan is suspended.
- New N25 section between Shanacoole, Co. Waterford and the Youghal Bypass. This proposed scheme includes a new river crossing of the Blackwater. This plan is presently suspended.
- N25 Dungarvan Bypass – The scheme involves an outer bypass of Dungarvan, County Waterford from the Pike (east of Dungarvan) and terminating on the existing N25 west of Dungarvan. This plan is currently suspended.

9.3 Site Access

Traffic to the facility is directed to the Rincrew Roundabout on the N25, from there the traffic takes the R634 exit. Site traffic follows signposting for the neighbouring NCT Centre and Landfill. This will lead the traffic onto the T12. The first entrance gate is taken by all waste and maintenance vehicles, while staff and visitors access the site through the 2nd entrance gate. Outgoing traffic follow the same route to the Rincrew Roundabout. As the majority of the existing customers are pharmaceuticals from the East Cork region, the main route taken on this roundabout is the west turning on the N25. Other than local based staff and maintenance crews, no site traffic will go in the direction of Youghal town.

The access junctions to the site have been designed and constructed in accordance with the Design Manual for Roads and Bridges (D.M.R.B.). The sight lines, site frontage and general site layout has been designed according to relevant planning conditions.

The following is approximated widths of relevant sections of the T12 roadways, entrance gates and weighbridge:

- Roadway width = ~ 6.50 metres
- Pathway Width on roadside adjacent to facility = ~ 1.40 metres
- Pathway Width on roadside closest to facility = ~ 0.60 metres
- Distance from edge of road to entrance gate = ~ 9.10 metres
- Weighbridge width = ~ 3.00 metres

9.4 Impacts of Proposed Changes

The original traffic model was based on the facility accepting 110,000 tonne per annum, which was broken down as

- 30,000 tonnes of Sludge;
- 70,000 tonnes of C& I Waste; and
- 10,000 tonnes of Leachate.

The facility never reached the authorised annual waste intake and hence the traffic levels have been much less than the predicted. However, over the same period the road networks around the facility has been significantly upgraded, such as the enhanced approach roads (N25) and new T12 road which now caters for two-way HGV movements.

The proposed changes will reduce the overall waste inputs to 95,000 tonne per annum and change the ratios to:

- 40,000 tonnes of Sludge
- 20,000 tonnes of Household/Commercial/Industrial waste
- 5,000 tonnes of leachate
- 30,000 tonnes of hazardous waste

Household waste has generally the same characteristics as Commercial Wastes and there is no significant difference in weight. The hazardous will primarily be in an aqueous or sludge form and will be heavier volume/volume than the Household/C&I. This will mean that that the number of vehicle movements will be less than estimated in the original traffic impact assessment (parent permission) for the same overall annual tonnage intake.

The original TIA took into consideration the traffic associated with the construction of the existing facility, which was a relatively large scale development that was carried out over 6 months. The proposed changes do not require significant construction works. It is estimated that the new digester tank will be constructed in 4 weeks. The Aquacritox Plant will be fabricated off site and delivered and assembled over a period of 6 weeks.

The proposed development will result in a reduction in traffic movements compared to those already approved and therefore will have a positive impact.

An analysis of internal vehicle movements has been completed, which demonstrates that there is adequate room within the site for vehicle manoeuvring. The results of the analysis are shown on Drawing No P521-03

9.5 Mitigation Measures

Existing Measures

ERAS ECO Ltd has already implemented the following mitigation measures in place:

- During construction work all staff, contractors and visitors are made aware of the additional health and safety risks onsite. Non construction related personnel are segregated from these works by barriers/exclusions zones and clearly marked signs.

- All deliveries are scheduled in advance. Care is taken to ensure that waste movements avoid, where possible, days and times of heavier traffic. In particular the minimisation of traffic during peak days (i.e. Fridays and Mondays) and hours (i.e. 09:00 – 10:00 on Fridays) is paramount.

Proposed Measures

As the site is already developed and the proposed changes will reduce traffic levels compared to those already approved, additional mitigation measures are not required.

10 AIR QUALITY

10.1 Introduction

This Chapter describes the ambient air quality, assesses impacts of the proposed changes and discusses mitigation measures. It is based on the air quality monitoring specified in the Waste Licence, additional monitoring carried out by ERAS ECO Ltd and an air quality and odour impact assessment, including air dispersion modelling, carried out by Odour Monitoring Ireland Ltd (OMI). The OMI report and the reports on the air quality monitoring are included in Appendix 6.

10.2 Existing Activities

ERAS ECO Ltd installed and commissioned an air emission abatement system in Building 2 in 2007. The system is designed to control odour emissions from the sludge treatment process.

The building is fitted with rapid closing roller doors and hydraulic lids on reception bins providing efficient containment of odours within the building. The biofilter odour abatement system extracts air from various stages of the sludge treatment process, including head gases from the storage hopper; the purged steam and evaporating volatile organics from the drying process; and also off-gases from treatment of the dryer condensate in the WWTP. The system provides negative ventilation to the area handling the sludge (i.e. where odours are generated).

In 2008, the EPA commissioned an audit of the system to assess performance. The audit report, which was issued in 2009, identified a number of measures that would improve performance that included:

1. Adoption of odour management/control procedures;

2. Additional sealing of the building fabric;

3. Maintenance of the existing good housekeeping practices;

4. An assessment of the operation of the biofilter, and

5. The installation of an additional carbon filter system.

The audit report recommended the implementation of each of these measures on a staged basis, with each stage assessed for performance before proceeding to the next stage. All of these actions, with the exception of the provision of the carbon filter, were subsequently implemented. Due to the significant improvement in performance as a result of actions 1-4, the carbon filter system (action 5) was not considered necessary.

The Odour Management Strategy (OMS) implemented by ERAS ECO Ltd in response to the audit findings includes weekly inspection of the biofilter media, measuring the pressure differential across the bed, monitoring of ammonia, hydrogen sulphide, and mercaptans, and monitoring of the sump water (bacterial and pH levels).

10.3 Existing Air Quality Environment

There are currently two point emissions to air (i.e. A1 Boiler and A2 Biofilter) whose locations are shown in Figure 7.1 of the OMI Report. The emissions are subject to the routine monitoring specified in the Waste Licence, which also specifies the emission limit values (ELV) that must be met.

The monitoring of the boiler emission point includes oxides of nitrogen and sulphur, carbon monoxide and particulates. The biofilter monitoring includes ammonia, organics, hydrogen sulphide, mercaptans and amines. Dust deposition monitoring is carried out at three on-site locations three times annually and odour monitoring at the site entrance and boundaries is conducted daily by site staff. The monitoring has confirmed that the emissions comply with the ELVs and applicable air quality standards.

In addition to the specified monitoring, ERAS ECO Ltd conducted particulate monitoring at three, on-site and one off-site (nearest residence) location, the results of which are presented in Table 10.1

Table 10.1 PM10 levels

Sample Location	Start date	Start time	Duration	Average PM10 conc. ug/m3
1	14th October 2010	09:05	8 hours	30
2	14th October 2010	09:03	8 hours	22
3	14th October 2010	09:01	8 hours	22
4	14th October 2010	09:05	8 hours	35
Limit				**50**

ERAS ECO Ltd has received complaints about odours related to site operations. All of the complaints are investigated. In 2009, fifteen complaints were received. In 2010 after the implementation of the improvement measures recommended in the EPA commissioned report, only five complaints were received. Subsequent investigations established that the facility was not the source of the odours that gave rise to four of the complaints.

10.4 Impacts of Proposed Changes

The proposed changes will give rise to the following additional point emission sources to air:

- Trim Heater (A3)
- Odour Control Unit (carbon filter) Materials Recovery Building and AD Plant (A4)
- CHP Plant (A5)
- Aquacritox Plant (A6)
- Solvent Fill Tank (A7), and
- Solvent Storage Tanks

The emission points are shown on Figure 7.1 of the OMI Report and Drawing No P521-02 Emissions will include oxides of nitrogen, oxides of sulphur, carbon monoxide, particulates, hydrogen chloride, hydrogen fluoride and volatile organic compounds. The OMI assessment included air dispersion modelling to assess the impacts of the emissions in the context of the relevant air quality standards and guidance, which included:

- Air Quality Standards Regulations (S.I. No 271 of 2002);
- Odour Impacts and Odour Emission Controls from Intensive Agriculture; and
- Air Dispersion Modelling from Industrial Installations Guidance Note AG4 2010.

The assumptions used in the modelling and the methodologies applied are detailed in the OMI Report. The modelling confirms that all the emissions from the site, including the existing and proposed emission points will comply with the applicable air quality standards (oxides of nitrogen, oxides of sulphur, carbon monoxide, hydrogen chloride, hydrogen fluoride, benzene and particulates) and odour limits. The proposed changes will have a neutral impact.

10.5 Mitigation Measures

The current air quality and odour management controls and procedures will continue to be implemented. A new odour control unit (OCU) comprising an air extraction system and carbon filter will be provided to treat odours from the mixed MSW processing area in the Building 1.

The OCU will have a treatment capacity of 30,000 Nm^3/hour. The total treatment capacity required for the mixed MSW processing area is 15,000 Nm^3/hour. The additional 15,000 Nm^3/hour capacity is provided to treat odorous air from the AD plant and the sludge drying area, if this is considered necessary. The proposed design and method of operation will be approved by the EPA before the unit is installed and commissioned.

The OMS will be revised to include the routine inspection and maintenance of the OCU to ensure it operates at optimum efficiency.

11 NOISE

11.1 Introduction

This Chapter discusses the impacts of noise associated with the proposed extension of waste activities. The assessment included two noise surveys completed by BHP, whose full report is included in Appendix 7.

11.2 Survey Details and Results

The monitoring and assessment of the results were conducted in accordance with international noise standards, in particular ISO 1996 1982: Acoustics Description and Measurement of Environmental Noise and BS 4142 1997 Method of Rating Industrial Noise affecting Mixed Residential and Industrial Areas. The survey was conducted on 14th October 2010 during day and night time hours when the facility was fully operational.

Measurement Locations

The measurement locations included four onsite stations (N1, N2, N3, N4) and one off-site noise sensitive location (NSL), which is specified in the Waste Licence. N1 is on the north eastern boundary, N2 is at the southern boundary, N3 is on the western boundary, inside the railings near the main road; and N4 is at the rear of the Sludge Drying Building. NSL is the nearest occupied house to the current and proposed facility approximately 500m away close to the R634 road between Rincrew and Youghal.

Operations

Noise emissions arose from several sources during the survey;

- Truck movements through entrance and weighbridge.
- Truck and plant movements around yard areas.
- Sludge Drying Process operating almost continuously.
- Operation of the WWTP

Instrumentation and Procedure

The BHP report details the methodology applied and the instrument calibration procedures.

Measurement Parameters

The measurement parameters applied were: -

1) L_{aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period;

2) L_{amax} is the instantaneous maximum sound level measured during the sample period;

3) L_{Amin} is the instantaneous minimum sound level measured during the sample period;

4) L_{A10} is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise;

5) L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels are expressed in terms of decibels (dB) relative to 2x10-5 Pa.

Survey Findings

The results of the noise survey are presented in Table 11.1. The dominant source of noise at N9 was road traffic.

Table 11.1 Noise Survey Results June 2009

Location	Sampling Interval	Duration (mins)	L_{AEQ} dB	L_{A10} dB	L_{A90} dB	Wind speed m/s	Sampling notes
N1	1052-1017hrs	15	54.3	67.3	50.7	0.1-0.9	The main noise is associated with landfill activity reaching up to 58 dB at times mainly due to reversing sirens. Passing traffic included 5 cars reaching up to 58 dB.
N2	1033-1048hrs	15	48.3	54.2	46.6	0.1-1.2	The location is at the rear right corner of the facility. Distant traffic reaches up to 42 dB. Activity on the landfill reaches up to 53 dB at times.
N3	1015-1030hrs	15	48.7	50.9	42.8	0.1-0.8	The location is inside the railings beside the main road. Passing traffic reaches up to 60 dB. Some site activity reaches up to 45 dB at times. 9 cars passed during monitoring.
N4	1110-1125hrs	15	66.9	70.8	66.1	0.1-1.1	The location is at the back of the site behind the sludge process reception building. Noise from this building reaches up to 60 dB. The landfill operation is audible up to 58 dB, again reversing sirens are the main noise source
NSL (daytime)	1145-1200hrs	15	64.0	67.4	49.0	0.1-1.0	Traffic noise from the Rincrew to Youghal section of the R634 road reaches between 50 and 80 dB. 2 trucks and 11 cars passed during monitoring. The ERAS ECO Ltd operation was inaudible at this location.
NSL (2009)		30	59.8	61.2	49.4		
NSL (2008)		30	58		42		

The results of the night time survey at the NSL are presented in Table 11.2, which also includes monitoring data from 2008 and 2009.

Table 11.2 Noise Survey Results

Location	Sampling Interval	Duration (mins)	L_{AEQ} dB	L_{A10} dB	L_{A90} dB	Wind speed m/s	Sampling notes
NSL (night-time)	2340-2355hrs	15	50.1	44.1	35.9	<0.1	The location is close to the Rincrew to Youghal road and traffic on the road is audible up to 50 dB. The Eras Eco Ltd operation is a 24/5 or 24/7 operation, but was not audible at the time of monitoring.
NSL (2008)		30	46		36		

The L_{Aeq} levels at the noise sensitive location are greater than the day time limit of 55dB set in the Waste Licence. However, the location is very close to a main road and the noise is reflective of this, rather than activities at ERAS ECO Ltd. Very similar levels of noise were noted during the 2008 and 2009 surveys. There was no evidence of a tonal or impulsive components. The night time noise levels also exceeded the nightime limit of 45dB, but this was attributed to road traffic not associated with the ERAS ECO Ltd operation. A similar result was noted in the 2008 survey

11.3 Predicted Impact of the Proposed Development

BHP completed a predictive assessment of the noise that will be generated from the proposed changes to the facility operation. It was assumed that all existing and proposed treatment processes including the sludge handling, Aquacritox and AD will occur within enclosed buildings/tanks. New enclosed (AD) tanks will be provided outside Building 1. The CHP unit associated with the AD plant will be housed in a suitable containment unit.

The existing noise sources are as follows:

Monitoring Point	$L_{EX, Hr}$ dB(A)	ppeak dB(C)
Boiler Room	78	109
Drier Room	81	109
Pallet Crusher	83	110

The majority of the equipment for the Aquacritox plant will be located indoors and primarily consists of heat exchangers and reactor, along with associated pumps. Outside the building is an oxygen tank, solvent tank and associated equipment.

The proposed temporary storage of road tankers will only impact on noise through the vehicle movements. As the storage area is limited to 5 or less tankers (at any one time) this activity is not expected to impact significantly on noise levels.

It is not envisaged that there will be any additional noise from the proposed processes in the internal units. The pallet crushing now takes place approximately one week per annum using an outside contractor. Noise levels from this operation are expected to be greater than shown in the table, as the unit is larger.

11.4 Impact and Mitigation Measures

The proposed changes will result in an increase in traffic from current levels. However as the facility is already authorised to accept 110,000 tonnes per annum, and this will reduce to 95,000 tonnes, the predicted traffic noise will not be greater than forecast in the previous EIS.

The worst-case scenario will involve activities close to the residential location at the identified noise sensitive location. Tables 11.3 and 11.4 illustrates the resulting level of noise emissions for what the worst-case scenario for the noise sensitive location for a frequency of 5 truck movements in an hour between 8am and 6pm with and without a 2 meter earth barrier.

Table 11.3 Scenario: 10m from NSL with oncoming wind (2-5 m/s)-No barrier

Monitoring Location	$L_{AEQ\ (30mins)}$ **dB**
NSL	65.2

Table 11.4 Scenario: 10m from NSL with oncoming wind (2-5 m/s)-With barrier

Monitoring Location	$L_{AEQ\ (30mins)}$ **dB**
N4	53.9

It is concluded that noise levels resulting from the proposed development will not exceed 55dB (L_{AEQ}) at the noise sensitive location. This is the level as recommended by the EPA for such activities.

The noise associated with the proposed changes will increase due to increased traffic movements. However the projected increase in noise levels, compared to what is already present due to the proximity of the NSL to the main road, is low and will not represent a nuisance.

The following mitigations measures will be implemented to reduce overall noise impacts on the noise sensitive locations.

1: The internal access roads should be maintained to reduce vehicular noise, especially banging from empty trucks.

2: A speed limit of 30 km/hr should apply for vehicles operating in the site.

3: Any pallet crushing activities or other mobile external processes should occur in well-screened parts of the operation to further reduce noise impacts.

4: Activity should be limited to between 0800 hrs and 1800 hours Monday to Friday

5: An associated planting programme should be introduced to further screen the operation.

6: Periodic noise monitoring at the noise sensitive locations should be introduced to ensure that all national guidelines in relation to noise ELV are complied with.

7: A review of reversing sirens should take place with a view to their possible replacement with white sound technology.

12 ECOLOGY

12.1 Introduction

This Chapter describes the ecological status of the facility and the impacts of the proposed changes to ecological status of the facility. It is based on an assessment carried out by Scott Cawley. As it is not proposed to redevelop any landscaped or unpaved area it was not necessary to carry out a terrestrial ecological survey.

12.2 Existing Environment

The facility is either completely paved or covered with buildings and there are no significant landscaped areas, wetlands or ponds within the facility boundary. Some small areas of amenity grassland, hedgerow and flower beds have been planted, and some additional semi-natural habitat was found to be recolonising on sand and gravel in the marginal areas of the site. There were no signs of Badgers, Otters, Bats or any other protected fauna on-site, although large numbers of overwintering waterfowl occupy mudflat areas to the north of the proposed development site. The existing habitats are shown on Figure 12-1.

12.3 Evaluation of the Ecological Importance of the Site

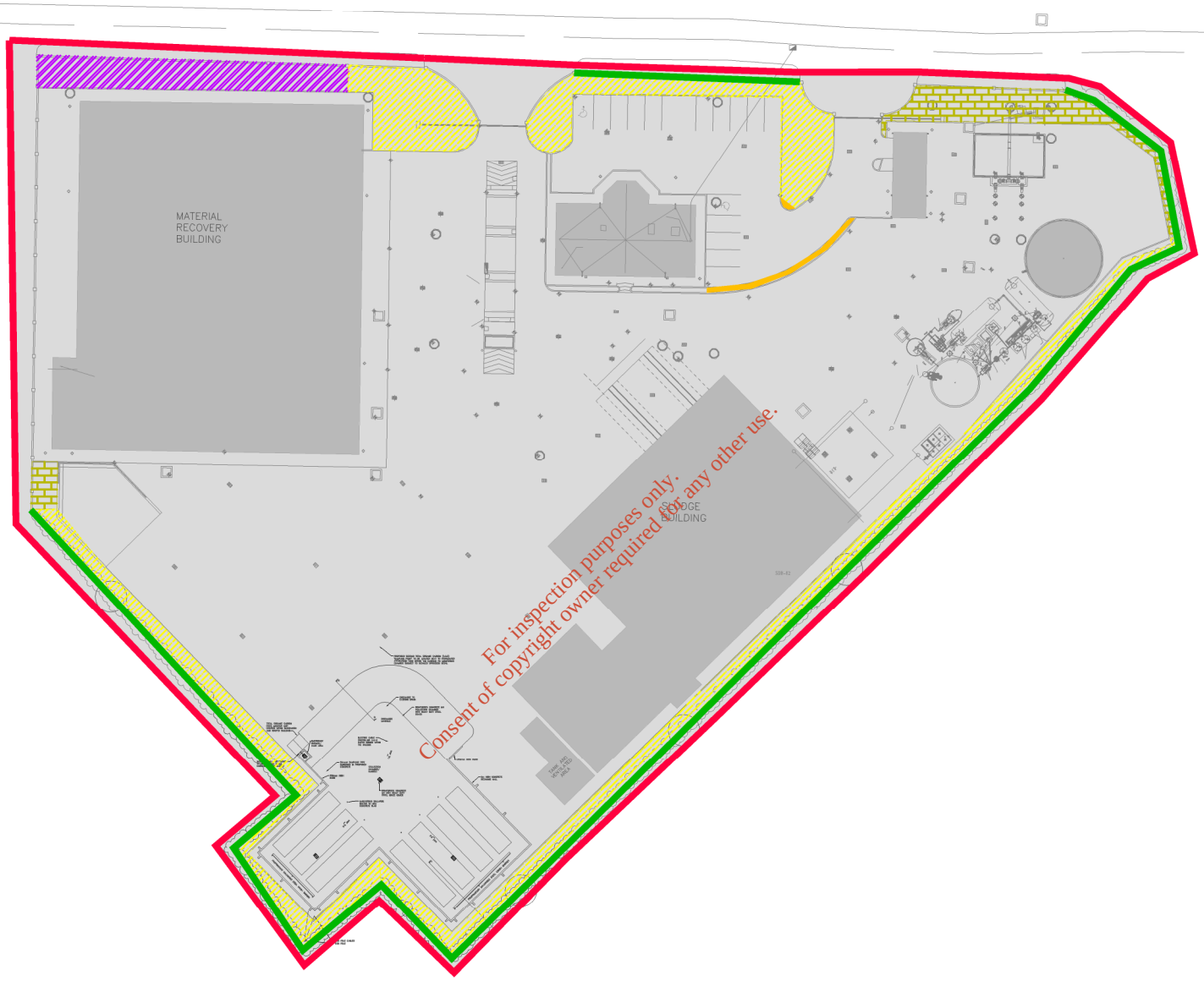
The evaluation was based on a desk study of databases maintained by the National Parks and Wildlife Service. The proposed development site is located near the banks of the Blackwater Estuary in Youghal Harbour. The area adjacent to the site is located within the Blackwater River candidate Special Area of Conservation and the Blackwater Estuary Special Protection Area. A number of other Natura 2000 sites and proposed Natural Heritage Areas are located within 15km of the proposed development site, but all of these sites are either concurrent with the cSAC or are not linked to the site by a definable source-receptor pathway.

12.4 Impact Assessment

As the proposed changes will take place entirely inside existing buildings or on existing built surfaces, it will not result in any direct ecological impacts. Potential indirect impacts may occur within the cSAC / SPA due to the discharge of treated wastewater into the estuary, due to spillages on the proposed development site, or due to noise. Potential impacts upon the Natura 2000 sites are described and assessed in an accompanying Natura Impact Statement and have not been dealt within this Chapter.

12.5 Mitigation Measures

As the proposed changes will not have any direct impacts, mitigation measures are not required. Ppotential indirect impacts could be caused by spillages of hazardous or non-hazardous waste on-site, or due to construction / operational noise. Mitigation measures have been proposed in other Chapters to mitigate these impacts



LEGEND

- BL3 - Buildings
- BL3 - Artificial Surfaces
- GA2 - Amenity Grassland
- ED1 - Exposed Gravel
- ED3 - Re-colonising Bare Ground
- BC4 - Flower Beds & Borders
- WL1 - Hedgerows
- Site Boundary

Title:	ERAS-ECO Habitat Map		
Figure No.:	12.1		
Client:	ERAS-ECO Ltd		
Project No.:	100108		
Date:	16/09/2010	Scale:	NTS
Rev.:	1	Source:	

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13 LANDSCAPE

13.1 Introduction

This Chapter describes the landscape at and in the vicinity of the facility and the impact of the proposed changes.

13.2 Methodology

The assessment of the landscape was based on guidelines in the document 'Landscape and Landscape Assessment, Consultation Draft of Guidelines for Planning Authorities' published by the Department of the Environment and Local Government (June 2002). It is based on site inspections carried out in October 2010 and a review of Ordnance Survey maps.

The study area was defined based on the visibility of the facility and the analysis of public viewpoints. The choice of viewpoints was influenced by the identification of private residences, key vantage points and the visibility of the existing buildings.

13.3 Site Context

The site, which encompasses an area of c. 1.6 ha, is located in an area zoned for industrial use approximately 2km from Youghal. The site is situated on flat lands, surrounded on one side by Youghal Landfill and the other by the National Car Test (NCT) Centre. The other areas surrounding the vicinity are predominantly industrial/enterprises most of which are located in one of the industrial estates, such as those the IDA Foxhole Industrial Estate and Millennium Park located off the R634. The nearest dwelling house is at the junction of the site access road (T12) and the R634.

As the facility was designed to form a linear block between NCT Centre and the Youghal Landfill, this has lessened the impact of the development. The most prominent structure onsite is the administration building, which is flanked on the eastern side by the sludge drying building and the waste recovery and transfer building on the western side.

The town of Youghal is steeply sloped, with a high point at the west of 80.0m OD and 0.0m OD at the river. To the east of the Blackwater in County Waterford, the lands rise to 100m OD, whilst on the west there is a less severe rise to the north. The facility is visible from some of these high points, in particular the elevated areas to the east (County Waterford). The site can be seen from

the N25, especially in the Waterford section directly opposite the site. However the Youghal Landfill and Civic Amenity Centre is the focal point of this fragmented landscape.

Views of the site from a number of what were deemed to be the most sensitive locations are shown in Figures 13-1 to 13-5. The view points included the closest amenity and residential areas (Figure 13-1 to 13-3 and the surrounding road network (13-4 and 13-5).

Figure 13.1 – Tinnabina (North East)

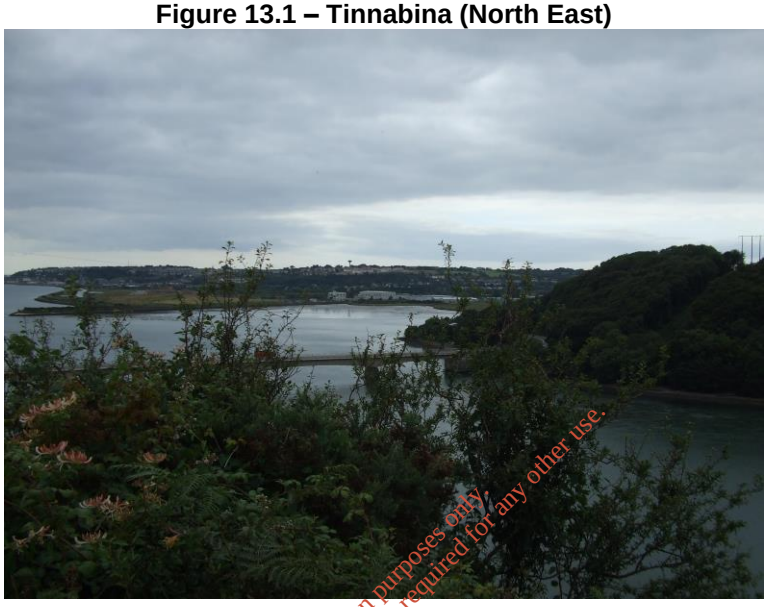


Figure 13.2 – GAA Field (South West)

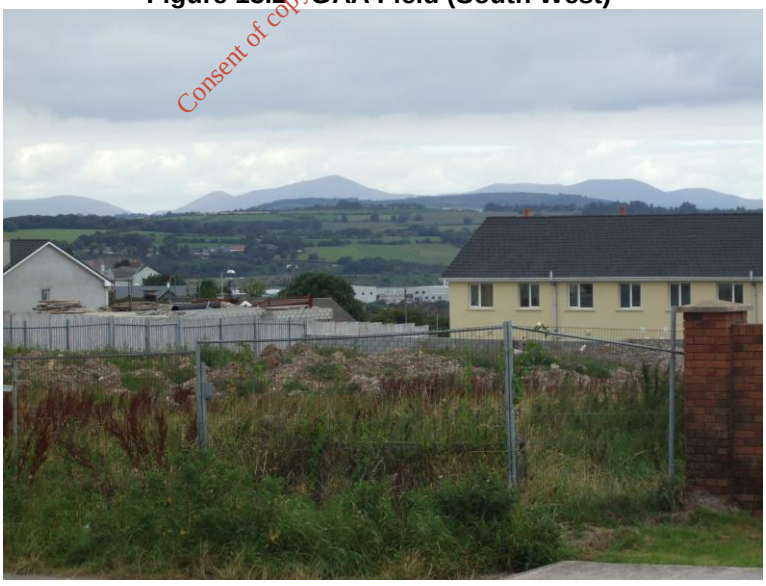


Figure 13-3 - Park Road

The site and the existing structures are visible at some residences, but are not interfering with views of the Blackwater river and beyond. The scale of the proposed development is in keeping with the existing developments in close proximity to the site. Overall, the visual impact of the proposed development on the surrounding residences of the area will be minor to negligible.

The main road routes in the vicinity of Youghal are the N25 and R634. To the north of the site, the facility is visible in places but much of the view of the facility (e.g. N25 Cork side of the Rincrew) is screened by hedgerows and other structures. The facility is visible from some high sections on the Waterford side of this Rincrew roundabout, however due to Foxhole being a low lying area; the facility does not prevent the vantage to and from the town.

Figure 13-4 - Rincrew Roundabout (North West)

Figure 13-5 - Tallow Road (R634)

13.4 Landscape Character

The site is not in an area designated as of scenic or of special amenity importance.

13.5 Landscape Sensitivity

The sensitivity of the landscape is low and the facility does not significantly interfere with the existing landscape character or eliminate a landscape value.

13.6 Impact Assessment

The site is already developed and includes two large warehouse type structures and an administration building. The proposed changes will involve the provision of purpose built tanks for storing of oxygen, solvents an above ground digester tanks, all of which will be located adjacent to a larger buildings. The front site elevation of the tanks are shown on Drawing No P10521-200. There will be no changes to the site boundary or the existing buildings.

As the additional activities being proposed are not going to dramatically alter the landscape of the site, the impact of such changes will be neutral.

13.7 Mitigation Measures

The existing development is visible but not conspicuous in the overall landscape. The proposed works will be constructed and located in a manner that places least impact on the surrounding views of the scenic area of Youghal. This can be achieved by the careful placement of structures, also continue with similar character, colour and height as existing structures. The present landscaping and mitigation measures above are adequate for both the existing and proposed measures.

14 HUMAN BEINGS

14.1 Introduction

This Chapter assesses the impacts of the facility on the local population. It describes the economic activity, social consideration, land uses, health and safety and significance of impact.

14.2 Existing Environment

Land use in the surrounding area varies between industrial, commercial, residential and agricultural uses. Figure No. 4.2 shows all dwellings within 300m of the site boundary, with the nearest dwelling approximately 170 m to the north west of the site boundary. There are no hospitals, hotels or holiday accommodation within 1km of the site.

14.3 Human Health

All wastes will be processed indoors thereby mitigating against any potential health impacts on occupants of the commercial units in the surrounding area and the nearest residences. All odorous waste is and will be processed in designated areas provided with an appropriate odour abatement system.

The processing of all wastes internally and the provision of appropriate control measures ensures that the facility does not attract vermin or birds. There are no routine emissions to ground or groundwater, which minimises the risk to groundwater.

Facility personnel are provided with appropriate personal protective equipment to minimise the risk of health impacts.

14.4 Socio-Economic Activity

The proposed changes will not adversely affect the existing economic activities in the surrounding area, nor will it reduce the potential for the expansion of economic activities in the area. The facility is in keeping with national and local waste management policy objectives and existing and proposed land use patterns, and will not result in the loss of amenities or rights of way. The proposal is potentially beneficial in that additional employment is expected to be provided.

14.5 Environmental Nuisance

The facility is designed and is and will be operated in a manner that either eliminates, or minimises to the greatest practical extent the risk of environmental nuisance, (noise, litter, and odours). The relevant mitigation measures have been described in detail in previous Chapters

14.6 Impact Assessment

It is considered that the proposed changes will have a neutral impact with imperceptible consequences for Human Beings in terms of their interaction with the environment.

15 ARCHAEOLOGY & CULTURAL HERITAGE

15.1 Introduction

This Chapter describes the archaeological significance of the site and assesses the impacts of the development. Given the size of the site, the available information on site history, and the scale of the proposed changes, the archaeological assessment was confined to a desk study.

15.2 Study Methodology

The desk study included a review the Record of Monuments and Places (RMP) of the Heritage Service of the Department of Environment Heritage & Local Government a review of Ordnance Survey maps for the area.

15.3 Archaeological and Historical Background

There is no record of any archaeological feature on the site.

15.4 Impact Assessment

There is no record of any archaeological feature on the site. The proposed changes require minimum ground disturbance and only in areas that are already covered in reinforced concrete. The changes will not have any impact.

15.5 Mitigation Measures

No mitigation measures are required.

16 MATERIAL ASSETS/ NATURAL RESOURCES

This Chapter describes the material assets on and in the environs of the site assesses the associated impacts and presents mitigation measures.

16.1 Introduction

This Chapter describes the material assets on and in the environs of the site assesses the associated impacts and presents mitigation measures.

16.2 Amenities

The facility is in an area zoned for industrial and related development. Neither the facility nor its immediate environs have a significant leisure or amenity potential. It is considered, based on the existing land use and the nature of the proposed changes, that the potential for diminution of amenities and leisure land use is negligible.

16.3 Infrastructure

The site already has its own waste water treatment plant. Therefore, there are no additional impacts on the existing sewage infrastructure in the area. There is no negative impact expected to other infrastructure in the area, which is zoned for industrial use. The only impact on infrastructure associated with the proposed operational changes is traffic on the local and regional road network and this is described in Chapter 9.

16.4 Agriculture

The proposed changes will not have any impact on agricultural land use in the area.

16.5 Socio-Economic Impact:

The proposed changes will reduce the volume of waste requiring export from Cork Area and will promote recovery and recycling by the use of the most advanced treatment options. This will have a positive impact on the socio economic activity of the area, given that it will secure the jobs of the staff currently employed and will lead to the creation of new posts.

16.6 Natural Resource Consumption

The existing facility is a significant consumer of energy in the form of electricity, oil & woodchip. As woodchip is the chosen fuel for steam generation for the drying plant, this is the primary source of energy (~8,922,100 kwh per annum), while electricity is the second most important (~600,000 kwh per annum) and Diesel (~200,000 kwh per annum), which is used to both fuel onsite machinery and start-up the boiler.

The facility currently uses diesel oil for fuelling the telescopic handler (i.e. Manitou and Forklift). The proposed processes will likely increase the working hours of these vehicles and hence increase the diesel consumption.

While the electricity needs will increased under the proposed schemes, the efficiency of the operations will be improve by the ability to produce electricity from both the AD plant and the Aquacritox system.

The facility obtains its water supply from the council's mains supply The average daily water usage in the facility is 39.3m^3 or approximately 10,280 m^3 (based on 2009 production and operational hrs) per annum. The water is used in three main areas:

- Process Water (Sludge Dryer Plant Boiler, Cooling Screw and wheel wash).
- Fire Water (Fire fighting equipment for entire site).
- In the administration building for sanitary water and potable water.

It is proposed to introduce rainwater harvesting onsite, which will capture all water from the significant roof surfaces and/or yards areas storing the water and possible treatment for use when needed in applications such as the wheel wash, the bio-filter and as cooling water for the dry product. There is a potential for 4025m^3 of water to be collected from the roofs annually, with a further 9,632m^3 from the paved areas.

The harvested rainwater will be suitable to use in any of the existing or proposed processes as no treatment would be required. Harvesting rainwater from the yard has site environmental and cost benefits. The water and used for the Biofilter sump replenishing water or backwashing purposes in the WWTP. This will have a positive impact in reducing the volume of run-off and reducing the amount taking from the mains supply.

16.7 Mitigation Measures

No mitigation measures are required.

17 IMPACTS DURING CONSTRUCTION

17.1 Working Hours

During the construction of the project, the working hours will be Monday to Saturday 07:00 – 07:00 for construction related staff. The current drying operations will continue 24 hours per day, seven days per week.

17.2 Effect on Human Beings

The construction works have limited ability to cause pollution or emissions to air. The element most likely to cause air emissions (odours) is the installation of the Aquacritox unit, as these works will be undertaken in the Building 2. Therefore, the Facility Manager will co-ordinate the construction works with down time for the sludge treatment process, to minimise the risk of odour escaping the building.

The nearest domestic dwelling is c.250m, located on the R634 junction, other than the additional traffic, no further impacts are expected during the construction stage. ERAS ECO Ltd and its main contractor will issue all personnel and sub-contractors with clear concise information pertaining to the location of the site, opening hours and traffic restrictions onsite. It is expected that the majority of construction workers and deliveries will arrive at 07:00.

All contractors will be briefed on the facility, license requirements and specific information relating to the surroundings and most sensitive receptors. The contractor will be expected to behave in manner that complies with the relevant conditions of the Waste Licence, by using the appropriate equipment and minimizing the impacts such as noise, vibration and traffic.

17.3 Waste Management Plan

ERAS ECO Ltd is responsible for the management of wastes generated onsite, although the facility may in turn demand contractors manage their own wastes. If contractors are required to manage their own wastes, such a requirement will be included in tender/agreement documents.

All wastes will be segregated and stored appropriately. If and when a receptacle requires emptying, the facilities manager or designated representative shall organise the safe collection and disposal of such wastes.

18 INTERACTION OF THE FOREGOING

18.1 Introduction

Earlier Chapters describe the impacts associated with the proposed changes and the mitigation measures. This Chapter discusses the significance of the actual and potential direct, indirect and cumulative effects of the changes due to interaction between relevant receptors. Only those receptors between which there is an identifiable actual or potential relationship are addressed.

18.2 Human Beings / Air

Waste activities have the potential to impact on human beings arising from noise, dust, vehicle exhaust emissions and odour. The location, design and method of operation have taken account of these emissions and effective mitigation measures have been implemented. These measures will comply with the requirements of the Waste Licence. The reduction in traffic will have a positive impact on air quality, as a result of less exhaust emissions.

18.3 Human Beings / Material Assets / Traffic

The proposed changes will result in a reduction in traffic compared to the level currently approved. The existing road network has the capacity to accommodate the currently approved traffic and the proposed changes will result in a positive impact.

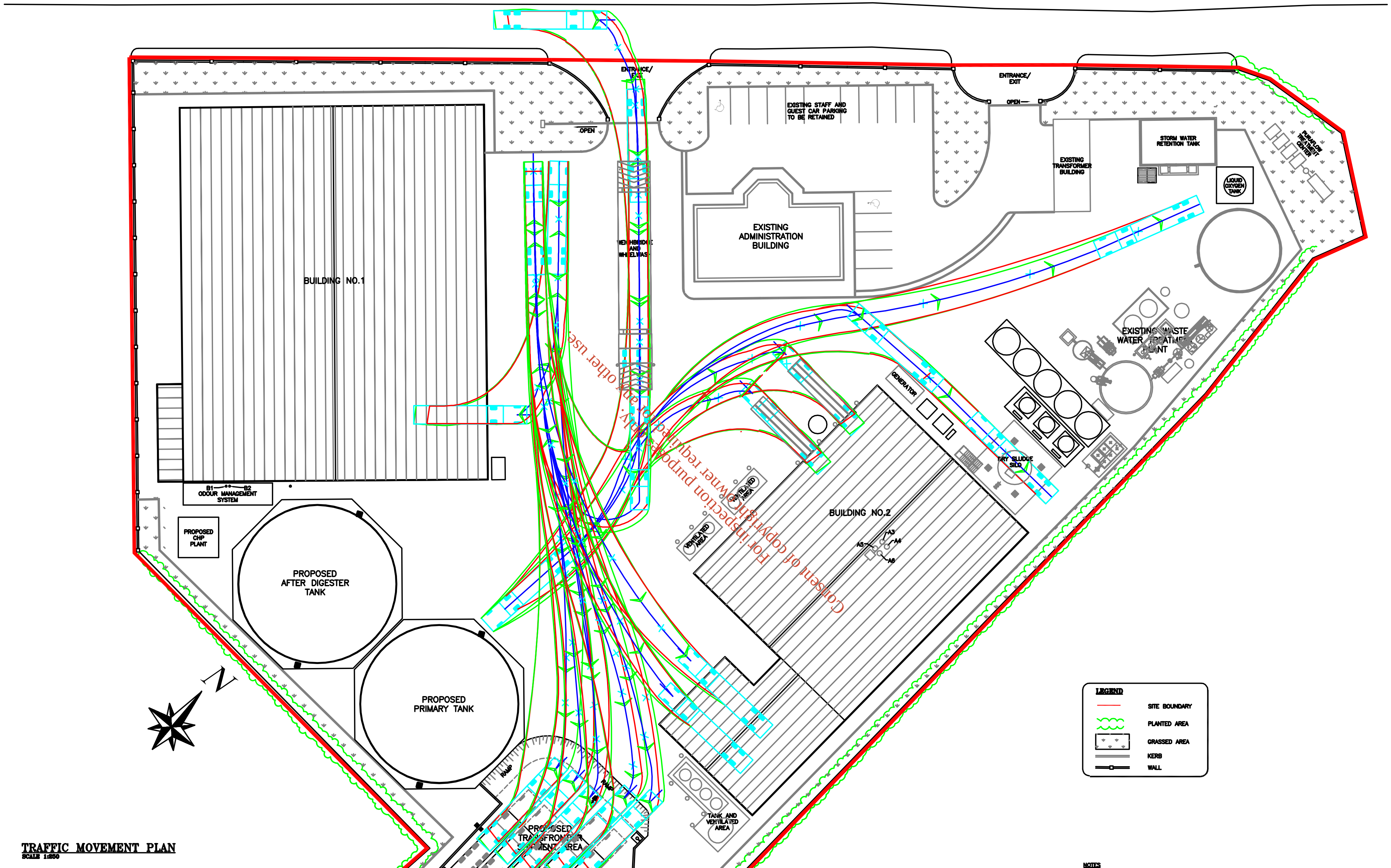
GLOSSARY

This glossary is not exhaustive and the definitions are solely as an aid to the non-technical reader.

Aquifer	A geological unit that stores and transmits significant quantities of groundwater under normal hydraulic conditions
AQS	Air Quality Standards
As	Arsenic
BAT	Best Available Techniques
BOD	Biochemical oxygen demand
BMP	Biomethane Potential
CCTV	Close circuit TV
Cd	Cadmium
CO	Carbon Monoxide
Co	Cobalt
CO2	Carbon Dioxide
Cr	Chromium
CSO	Central Statistics Office
Cu	Copper
dB	decibel
dB(A)	The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing.
DOEHLG	Department of the Environment, Heritage and Local Government
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ELV	Emission Limit Value
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
EU	European Union
EWC	European Waste Catalogue
GHG	Greenhouse Gas
GLC	Ground Level Concentration
Groundwater	Water that occupies pores and crevices in rock and soil, below the surface and above a layer of impermeable material
GSI	Geological Survey of Ireland
Habitat	The dwelling place of a species or community which provides a particular set of environmental conditions
HAZOP	Hazard and operability study
HGV	Heavy Goods vehicles are taken to include trucks and articulated trucks.
Hg	Mercury
HGV	Heavy Goods Vehicle
HSA	Health and Safety Authority
In-situ	In its original place, for archaeology it refers to the preservation of archaeological sites/features without disturbance
IPCC	Intergovernmental Panel on Climate Change
IPPC	Integrated Pollution Prevention and Control
ISO	International Standards Organisation
LGV	Light Goods Vehicle
L_{A10}	The sound level that is exceeded for 10% of the sample period (a weighted). It is typically used as a descriptor for traffic noise
L_{A90}	Sound level that is exceeded for 90% of the sample period (a weighted). It is typically used to describe background noise
L_{Aeq}	The equivalent continuous sound level, used to describe a fluctuating noise in terms of a single noise level over the sample period (a weighted).
Limit value	Specified in European Union directives or Irish regulation as a concentration of a pollutant which must not be exceeded in order to protect health or the environment
Methodology	The approach taken to analyse impacts on the environment
Mn	Manganese
MW	Megawatt
MSW	Municipal Solid Waste
NAAQS	National Ambient Air Quality Standards
NCT	National Car Test Centre, Youghal.

ng	nanogram (10^{-9} gram)
NHA	Natural Heritage Area
NH_3	Ammonia
Ni	Nickel
M^3	Cubic Metres
NO_2	Nitrogen Dioxide
NO_x	Nitrous Oxides
NRA	National Roads Authority
NSR	Noise Sensitve Receptor
O_2	Oxygen
OD	Ordnance Datum
OEL	Occupational Exposure Limit
PAH	Polycyclic aromatic hydrocarbons
Pb	Lead
pcSAC	proposed candidate Special Area of Conservation
pH	Potential of Hydrogen, measure of acidity or alkalinity of solution
PM_{10}	Particulate matter less than 10∝g (dust)
pNHA	proposed Natural Heritage Area
POP	Persistent organic pollutant
Pollution	The direct or indirect alteration of the physical, chemical, thermal, biological, or radioactive properties of any part of the environment in such a way as to create a hazard or potential hazard to the health, safety or welfare of living species
PPE	Personal Protective Equipment
PSD	Prevention of significant deterioration
Quaternary	The most recent Period of geological time (the last two million years)
QNHS	Quarterly National Household Survey
RMP	Record of monuments and places
RPGs	Regional planning guidelines
Run-off	The flow of water under gravity in open channels
SAC	Special Area of Conservation
SCWO	Supercritical Water Oxidation
SI	Statutory Instrument
SMR	Sites and Monuments Records
SO_2	Sulphur Dioxide
SO_x	Sulphur Oxides expressed as Sulphur Dioxide
SPA	Special Protection Area
STEL	Short Term Exposure Limit
TA Luft	Technical Instructions on Air Quality Control - TA Luft. In accordance with article 48 of the Federal Emission Control Law (BImSchG) dated 15 March 1974 (BGBI. ip. 721) Federal Ministry for Environment, Bonn 1986.
TDI	Tolerable daily intake
TFS	Transfrontier Shipment
TOC	Total Organic Carbon
UN	United Nations
Visual envelope	The extent of potential visibility of the proposed development to or from a specific area or feature in the landscape - defined by topography and vegetation
WHO	World Health Organisation
WWTP	Wastewater Treatment Plant

DRAWINGS



TRAFFIC MOVEMENT PLAN

SCALE 1:250

Revision change notes			Issue register					
Rev.	Date	Description	Rev.	Date	Description	Dwn.	Chkd.	Appvd.
				15.12.10	PLANNING	MB	IB	

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Date:	15.12.10
Scale:	1:250
Drawn By:	MB
Checked By:	IB
Client:	ERAS ECO LTD FOXHOLE YOUGHAL
Job Description:	INTRGRATED WASTE MANAGEMENT FACILITY
Project No:	10P521
Drawing Ref:	03
Rev:	

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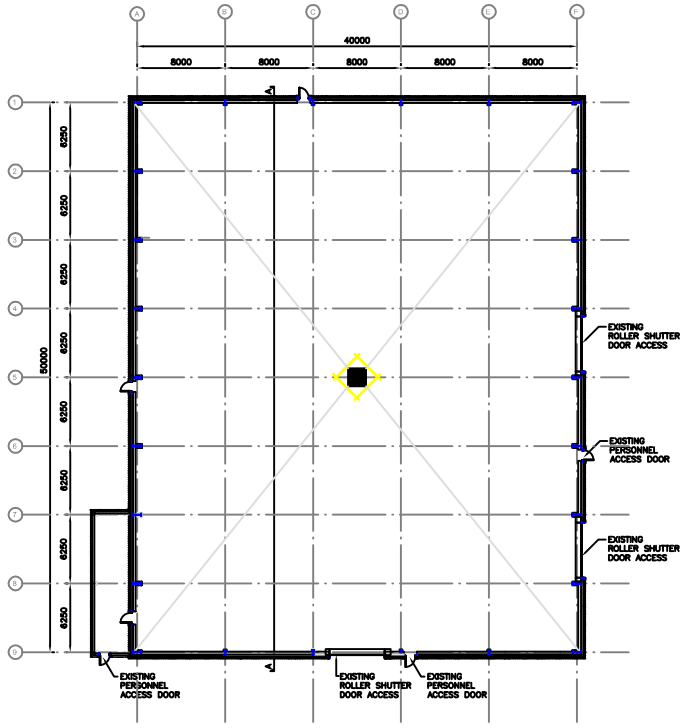
A1



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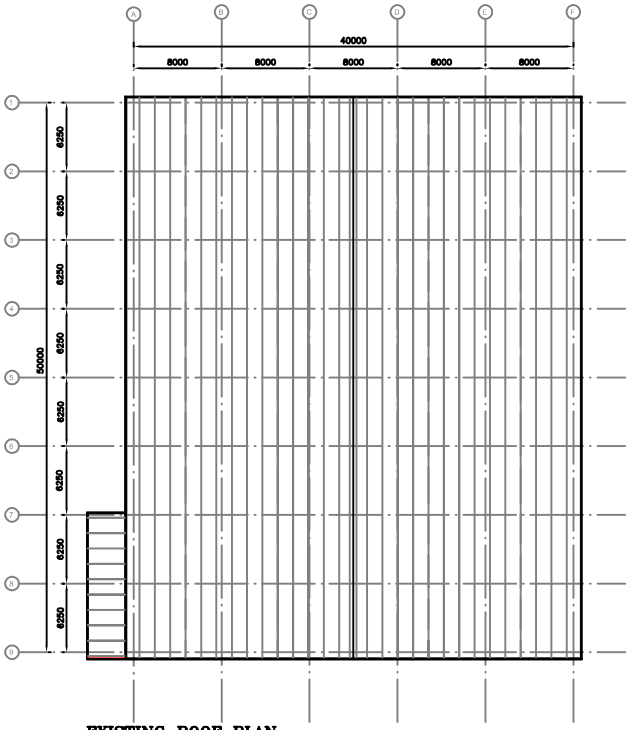

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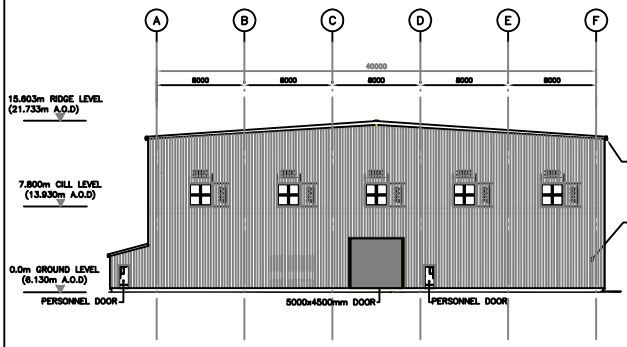
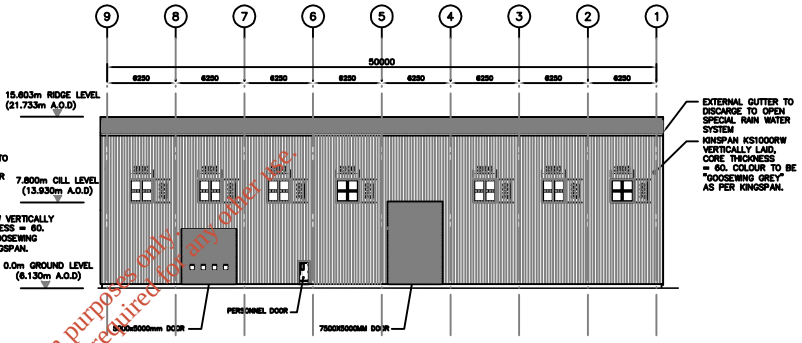
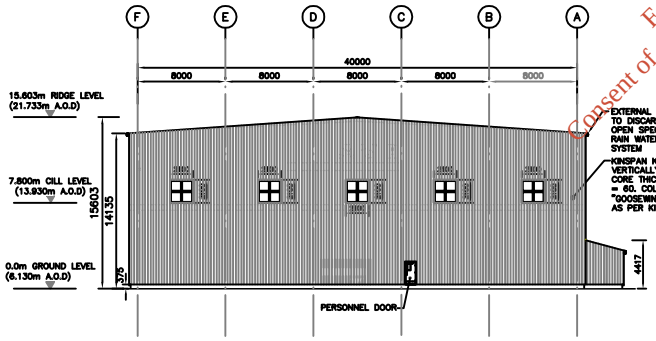


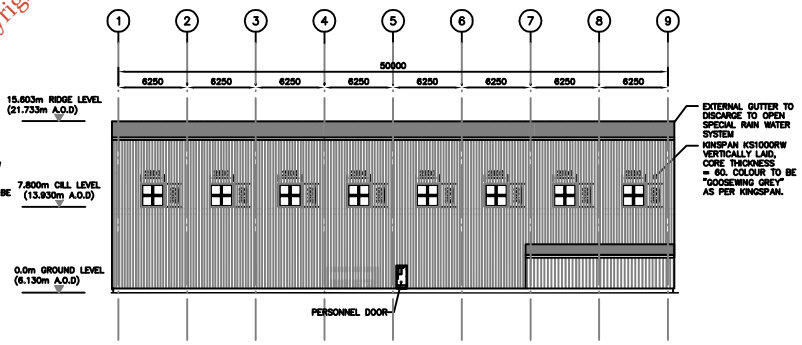
EXISTING SOUTH ELEVATION



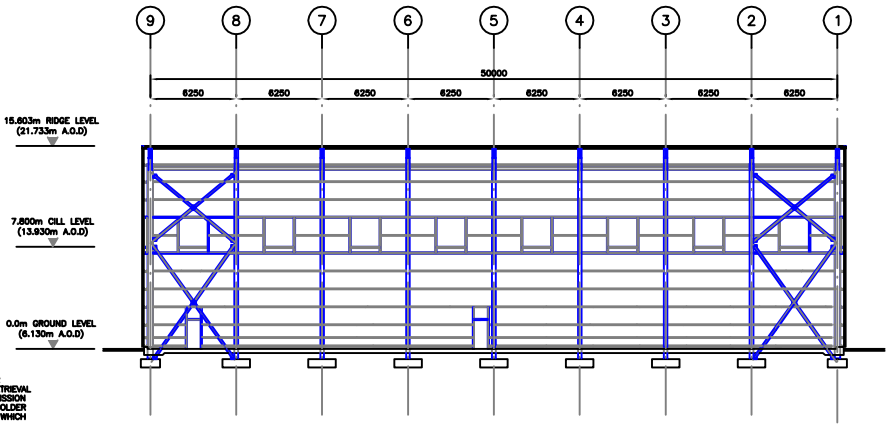
EXISTING EAST ELEVATION



EXSITING NORTH ELEVATION



EXISTING WEST ELEVATION



SECTION A-A

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Referenced drawings	
Dwg No.	Dwg Title

Revision change notes		
Rev.	Date	Description

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	15.12.10	PLANNING	MB	IB	

Drawing Title:
EXISTING BUILDING 1
PLANS ELEVATIONS AND SECTION

Date: 15.12.10
Scale: 1: 250 1: 200
Drawn By: MB
Checked By: IB

Client:
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INTRGRATED WASTE MANAGEMENT FACILITY

Project No: 10P521
Drawing Ref: 10
Rev:

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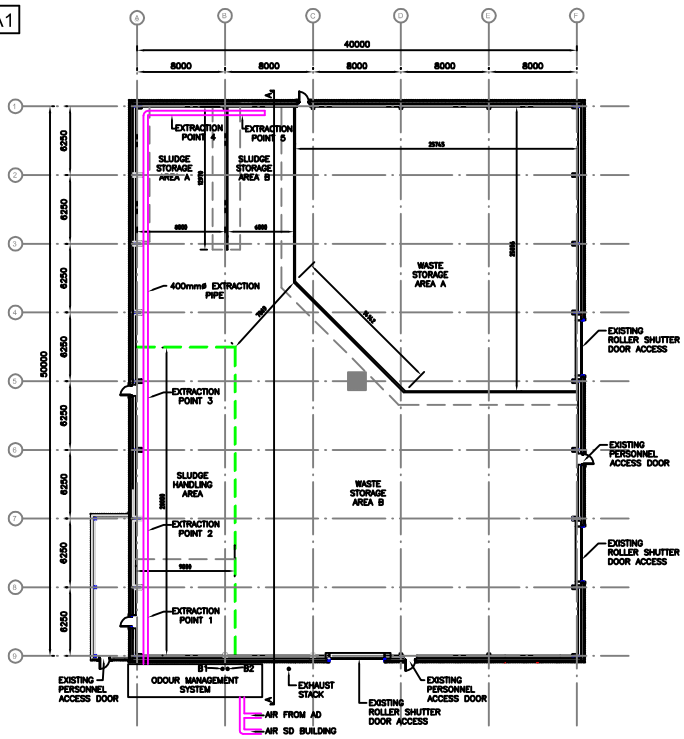
A1



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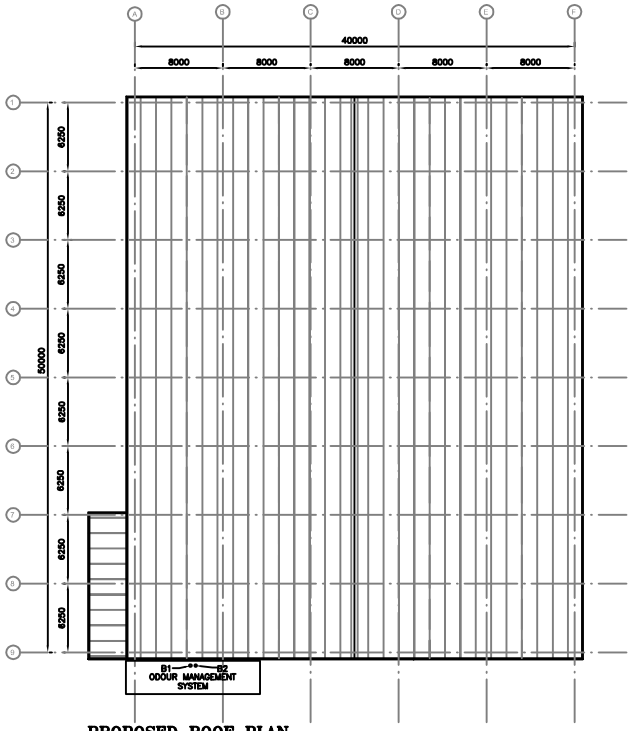

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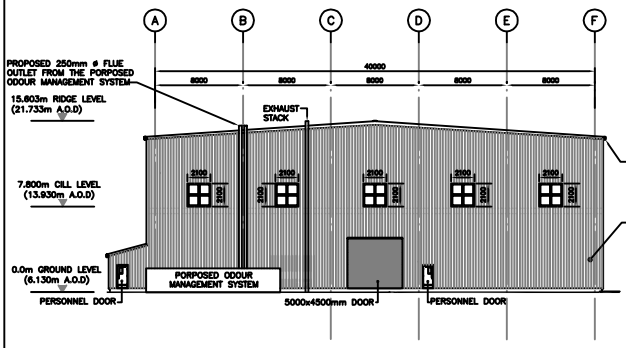

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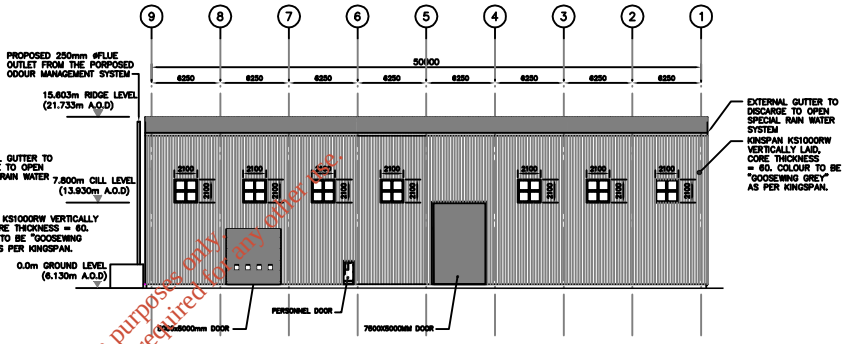

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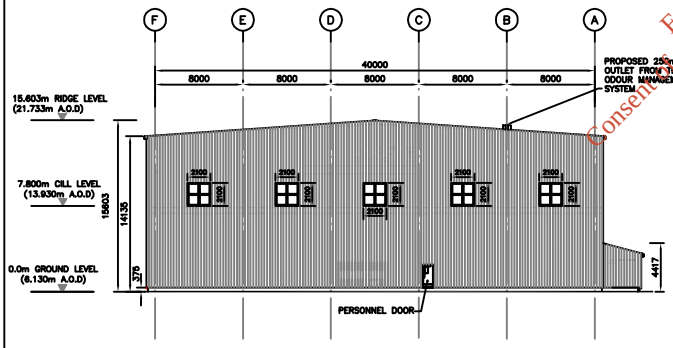

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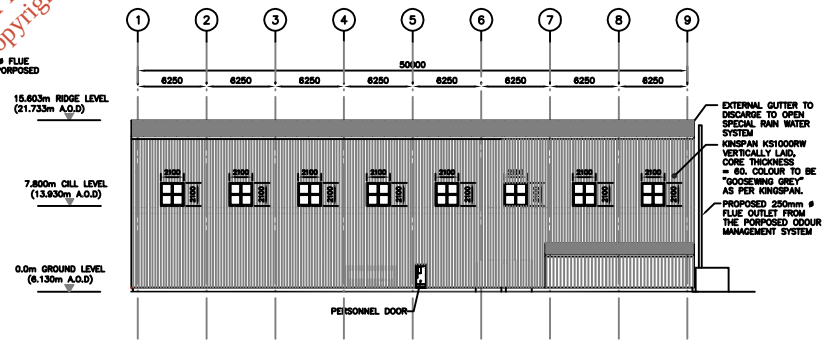

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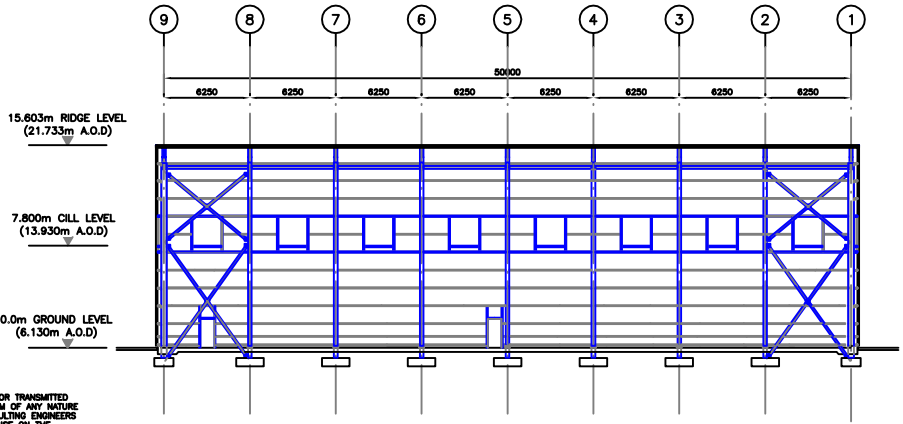

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Referenced drawings		Revision change notes			Issue register					
Dwg No.	Dwg Title	Rev.	Date	Description	Rev.	Date	Description	Dwn.	Chkd.	Appvd.
						15.12.10	PLANNING	MB	IB	

Drawing Title: PROPOSED BUILDING 1 PLANS, ELEVATIONS AND SECTION

Date: 15.12.10 | Scale: 1:250 1:200

Drawn By: MB | Checked By: IB

Client: ERAS ECO LTD FOXHOLE YOUGHAL

Job Description: INTRGRATED WASTE MANAGEMENT FACILITY

Project No: 10P521 | Drawing Ref: 11 | Rev:

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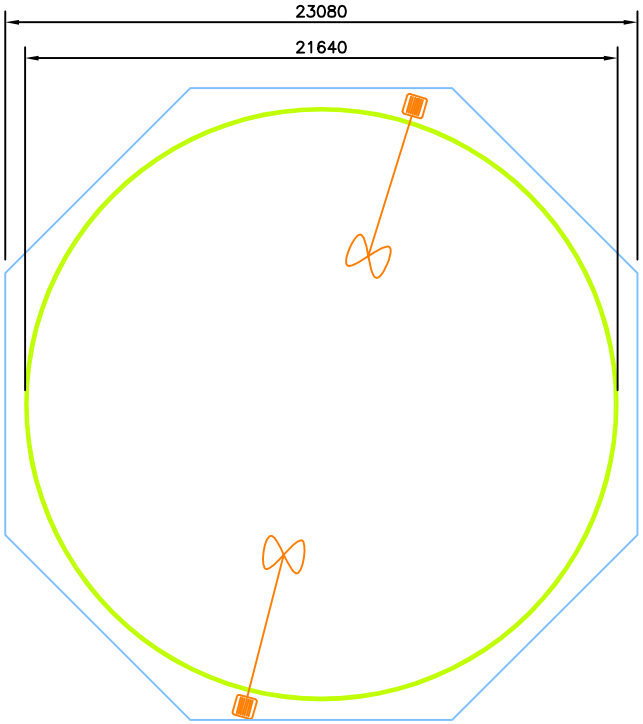
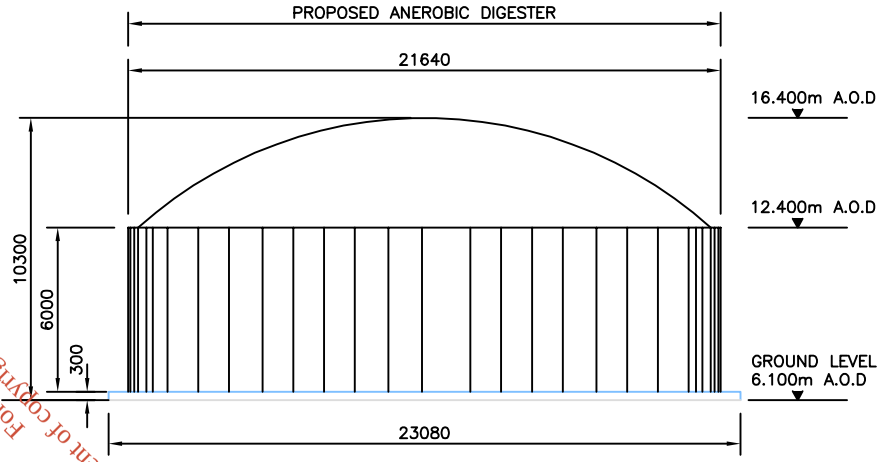


ANEROBIC DIGESTER PLAN

SCALE 1:200



ANEROBIC DIGESTER ELEVATION

SCALE 1:200

Issue Register					
Rev.	Date	Description	Dwn.	Chkd.	Appvd.
	15.12.10	PLANNING	MB	IB	

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Drawing Title:
PROPOSED AD PLANT
PLAN AND ELEVATION

Date: 15.12.10
Scale: A3 @ 1:200
Drawn By: MB
Checked By: IB

Client:
ERAS ECO LTD
FOXHOLE
YOUGHAL

Job Description:
INTRGRATED WASTE MANAGEMENT
FACILITY

Project No: 10P521
Drawing Ref: 15
Rev:

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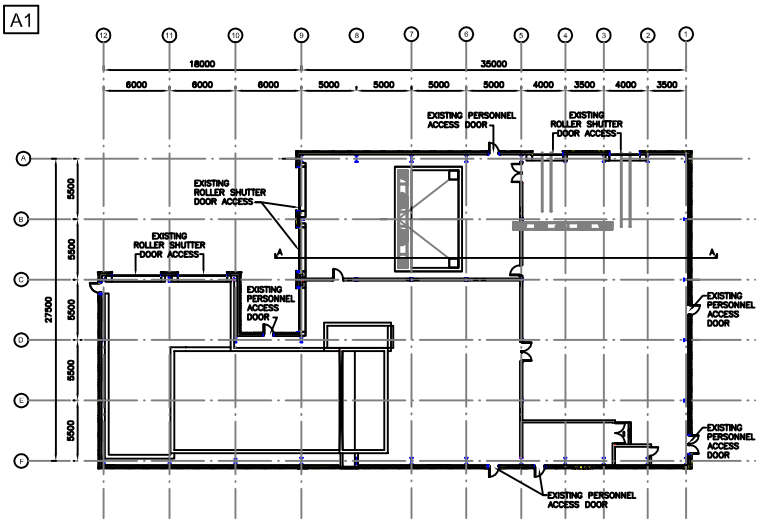

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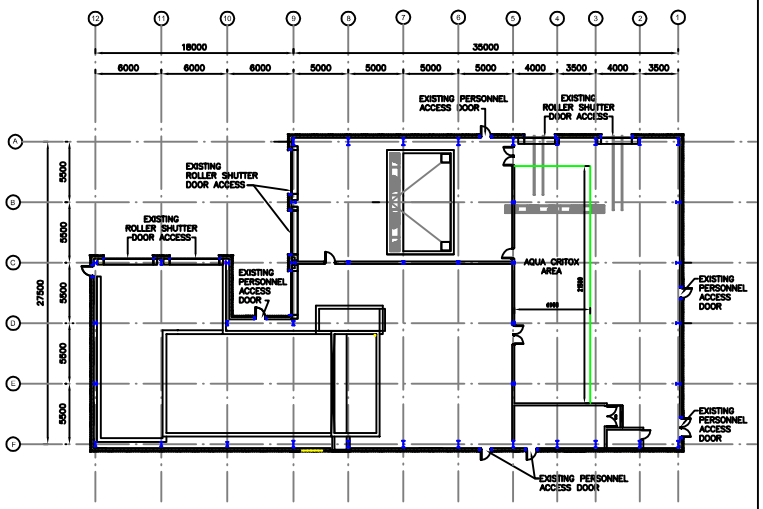

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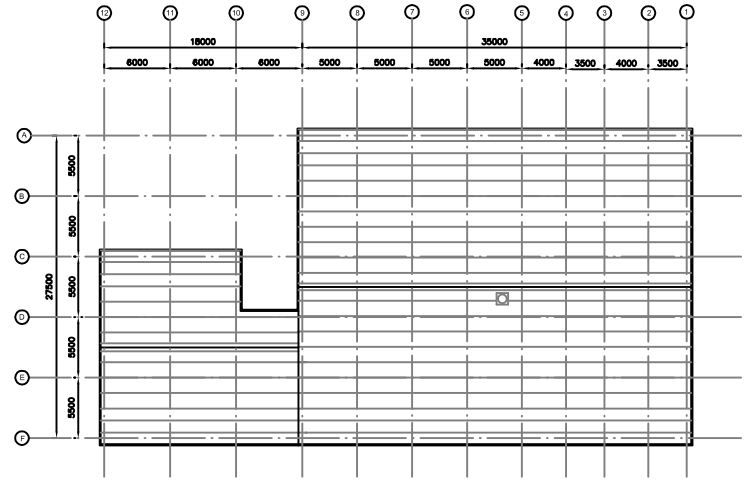

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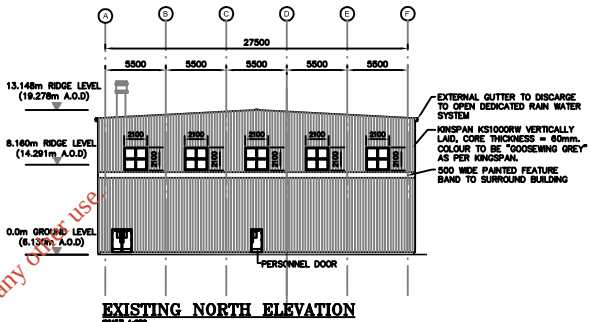

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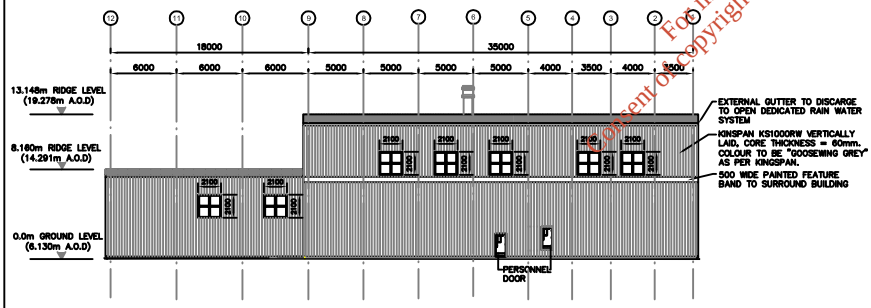

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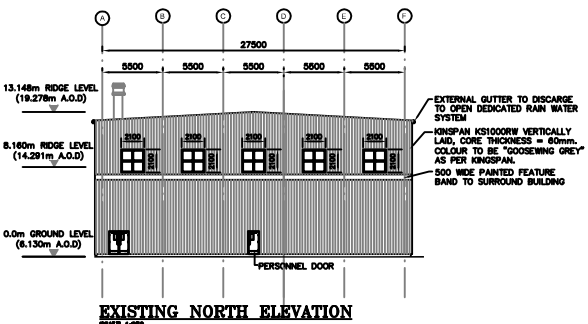

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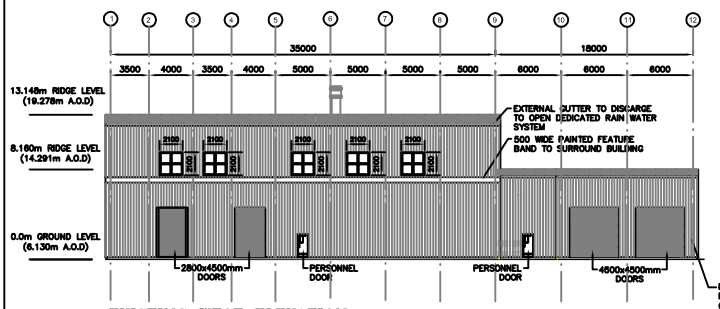

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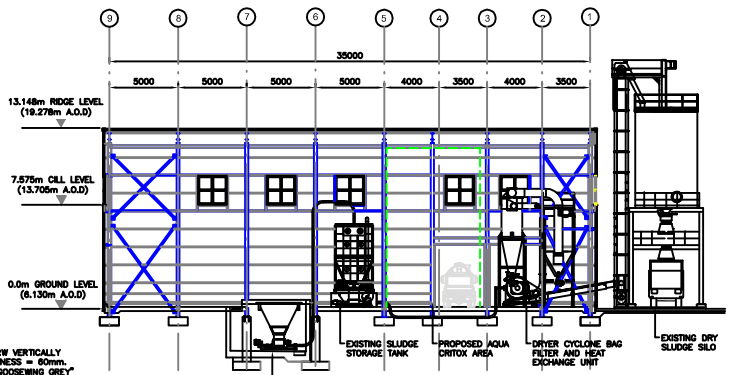

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Referenced drawings		Revision change notes			Issue register				
Dwg No.	Dwg Title	Rev.	Date	Description	Rev.	Date	Description	Dwn.	Chkd.	Appvd.
						15.12.10	PLANNING	MB	IB	

Drawing Title:
EXISTING/PROPOSED BUILDING 2 PLANS, ELEVATIONS AND SECTION

Date: 15.12.10
Scale: 1: 250 1: 200
Drawn By: MB
Checked By: IB

Client:
ERAS ECO LTD
FOXHOLE
YOUGHAL

Job Description:
INTRGRATED WASTE MANAGEMENT FACILITY

Project No: 10P521
Drawing Ref: 20
Rev:

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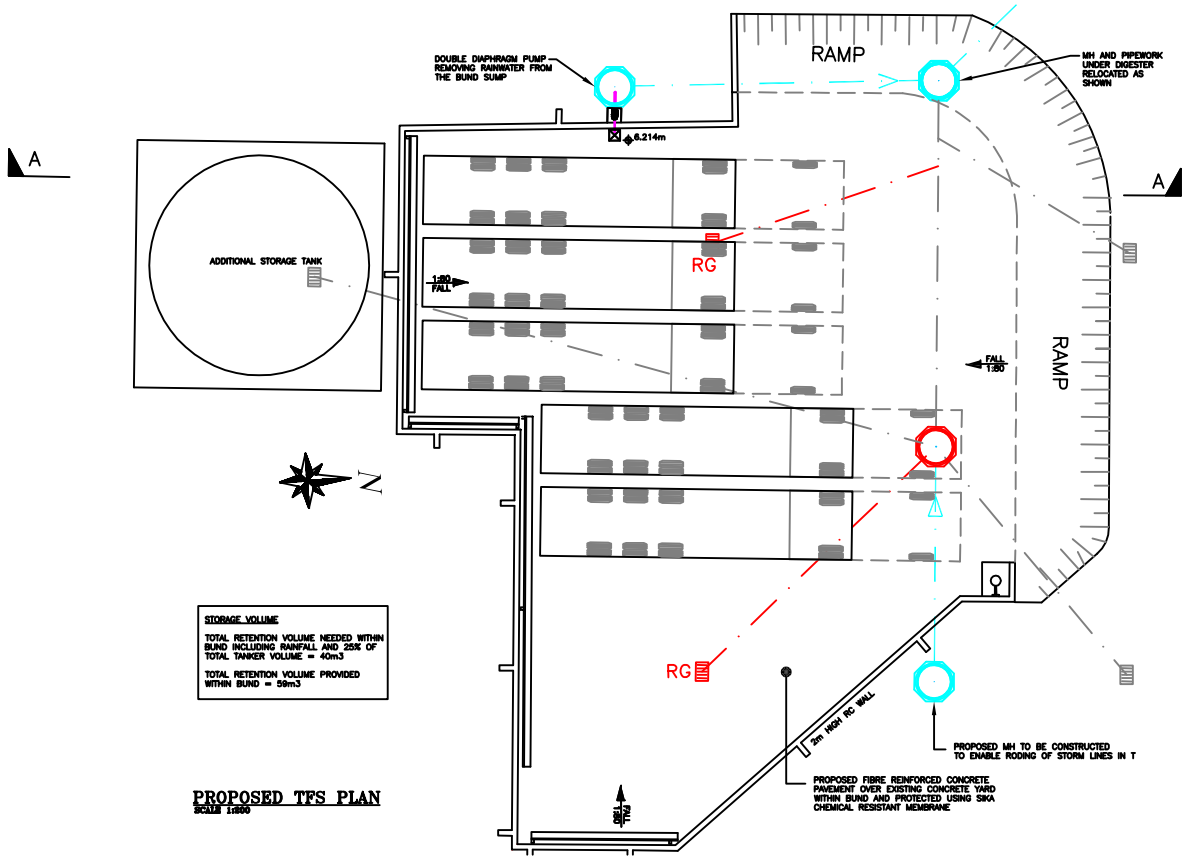

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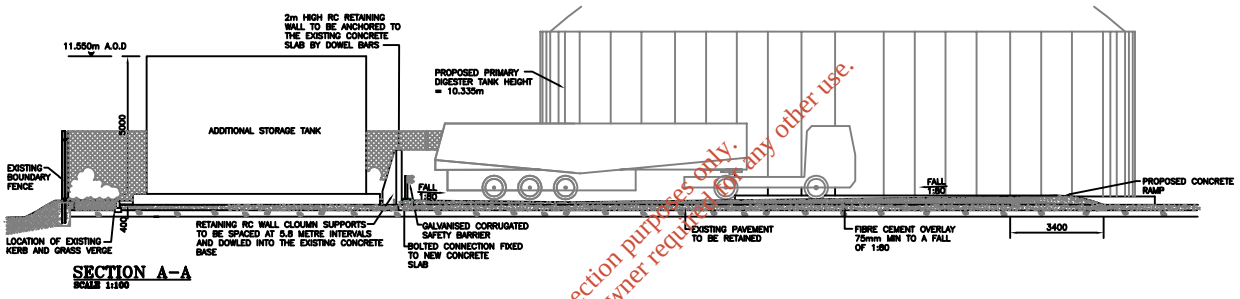

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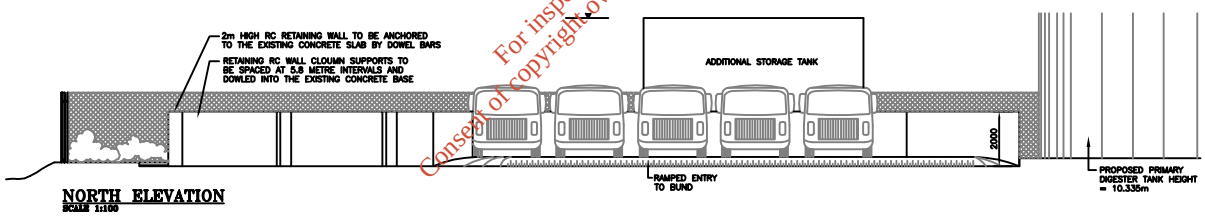

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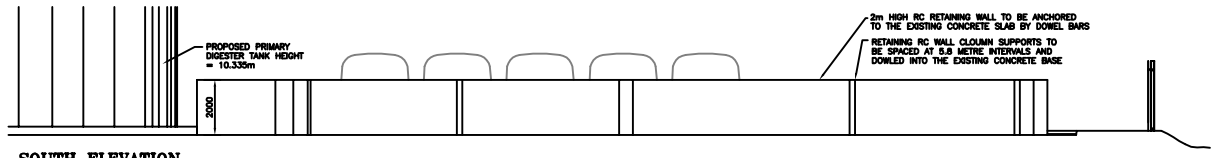

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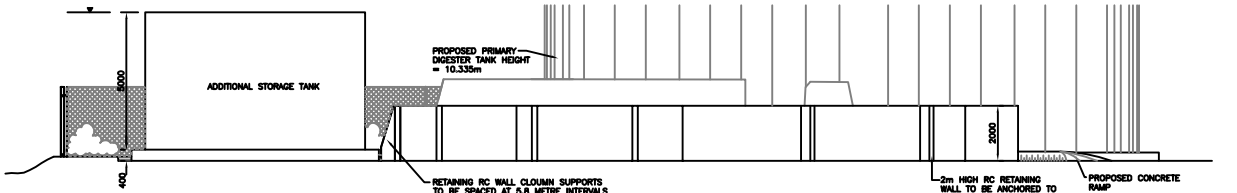

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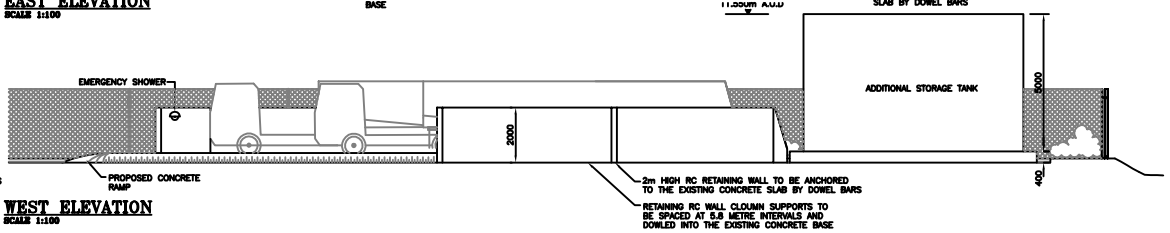

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SCALE 1:100

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Rev.	Date	Description

Issue register					
Rev.	Date	Description	Drn.	Chkd.	Appvd.
	15.12.10	PLANNING	MB	IB	

Drawing Title: PROPOSED TFS PLAN

Date: 15.12.10
Scale: 1: 200 1:100
Drawn By: MB
Checked By: IB

Client: ERAS ECO LTD FOXHOLE YOUGHAL

Job Description: INTRGRATED WASTE MANAGEMENT FACILITY

Project No: 10P521
Drawing Ref: 25
Rev:

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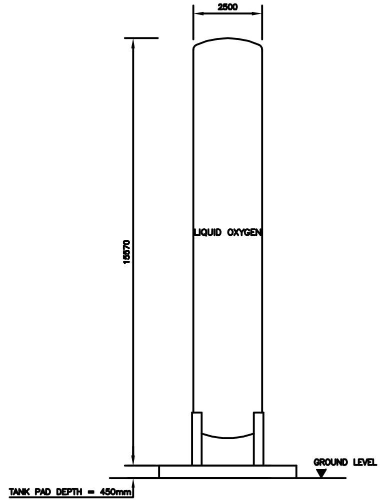

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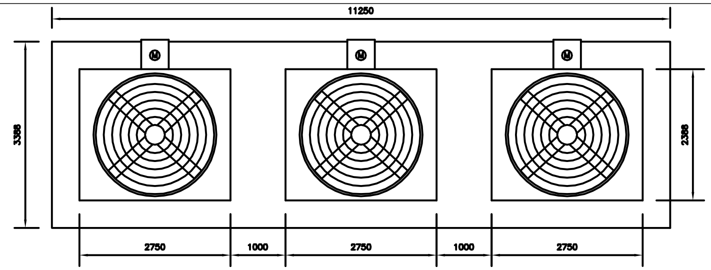

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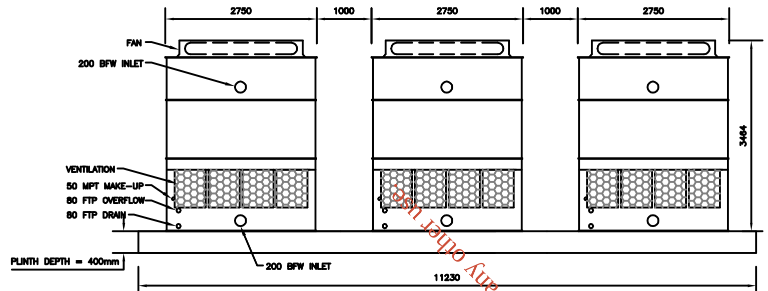

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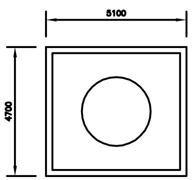

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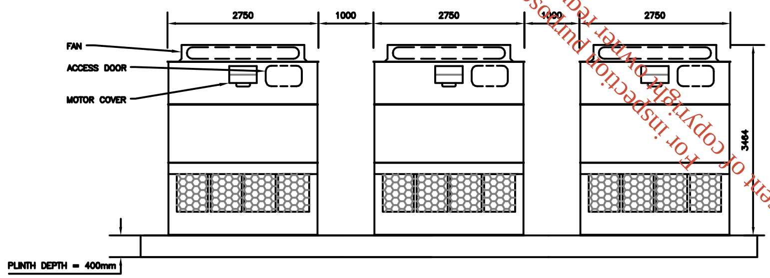

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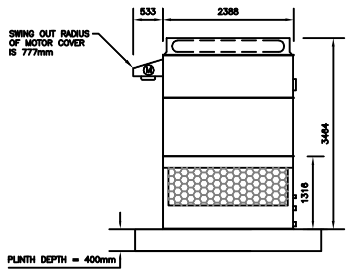

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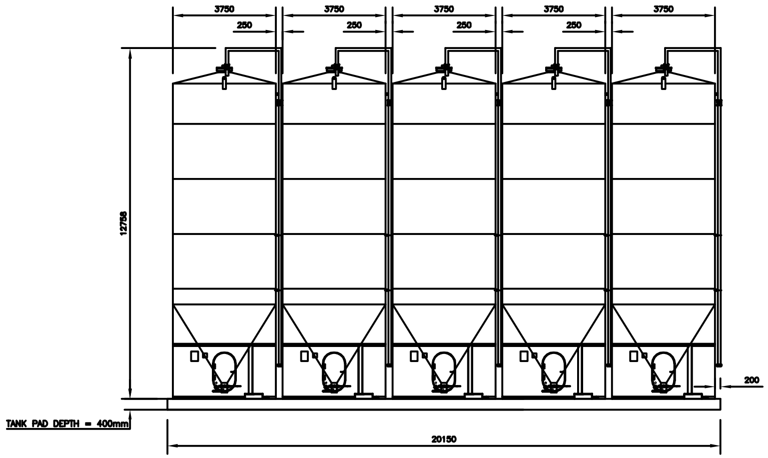

SOLVENT STORAGE TANKS ELEVATION
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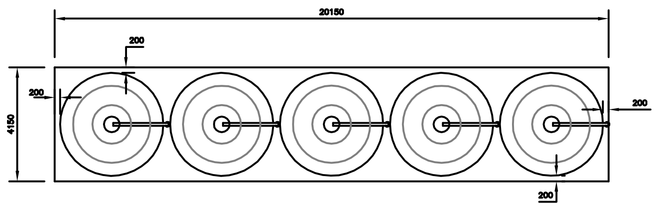

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SCALE:1:100

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Revision change notes			Issue register					
Rev.	Date	Description	Rev.	Date	Description	Drwn.	Chkd.	Apprvd.
				15.12.10	PLANNING	MB	IB	

Drawing Title:
PROPOSED OXYGEN STORAGE TANK, SOLVENT STORAGE TANKS AND COOLING TOWERS PLANS AND ELEVATIONS

Date: 15.12.10 | Scale: 1:50 1:100
Drawn By: MB | Checked By: IB

Client: ERAS ECO LTD FOXHOLE YOUGHAL
Job Description: INTRGRATED WASTE MANAGEMENT FACILITY
Project No: 10P521 | Drawing Ref: 30 | Rev:

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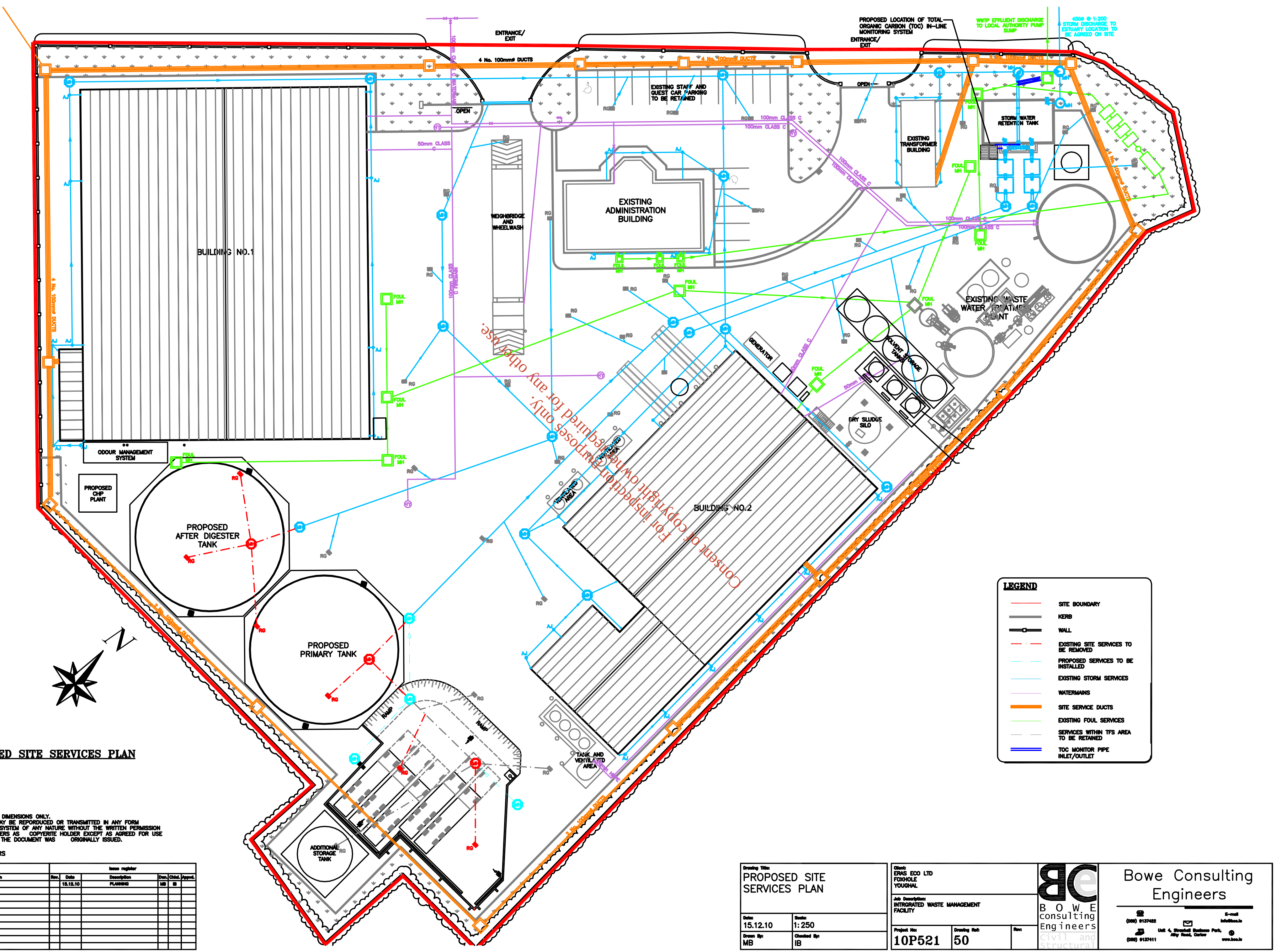

PROPOSED SITE SERVICES PLAN

SCALE 1:250

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				15.12.10	PLANNING	MB	IB	

Drawing Title:	PROPOSED SITE SERVICES PLAN
Date:	15.12.10
Scale:	1:250
Drawn By:	MB
Checked By:	IB
Client:	ERAS ECO LTD FOXHOLE YOUGHAL
Job Description:	INTRGRATED WASTE MANAGEMENT FACILITY
Project No:	10P521
Drawing Ref:	50
Rev:	

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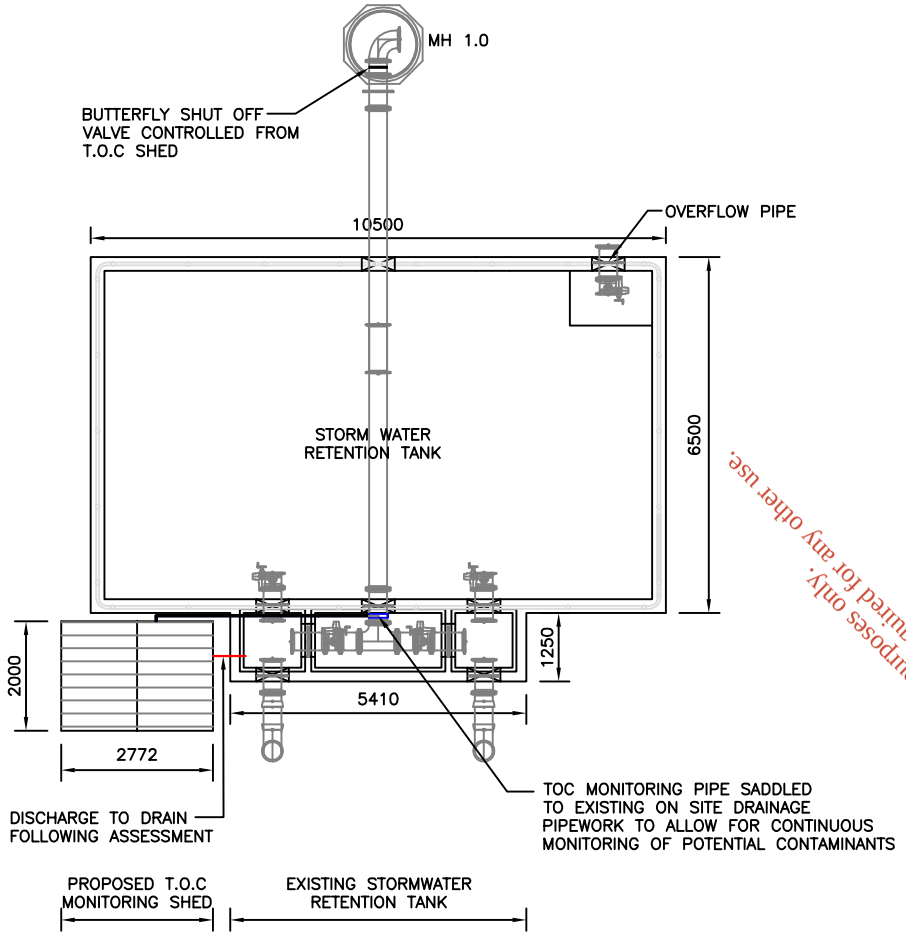

TOTAL ORGANIC CARBON PLAN

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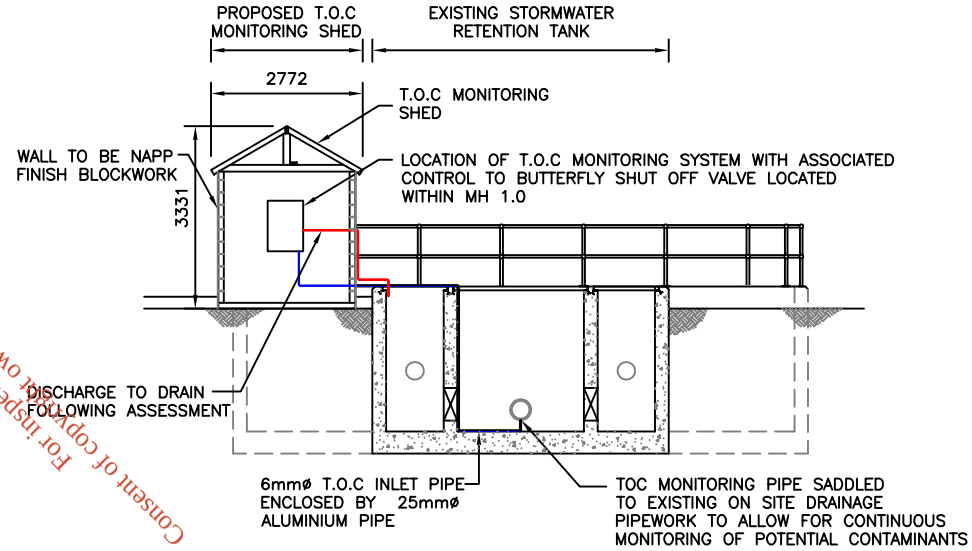

TOTAL ORGANIC CARBON SECTION

SCALE:1:100

Issue Register

Rev.	Date	Description	Dwn.	Chkd.	Appvd.
	15.12.10	PLANNING	MB	IB	

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Drawing Title: TOTAL ORGANIC CARBON MONITORING SYSTEM DETAILS

Date: 15.12.10 | Scale: 1:100

Drawn By: MB | Checked By: IB

Client: ERAS ECO LTD FOXHOLE YOUGHAL

Job Description: INTRGRATED WASTE MANAGEMENT FACILITY

Project No: 10P521 | Drawing Ref: 60 | Rev:

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PROPOSED ROAD FRONT ELEVATION

SCALE 1:250

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Revision change notes			Issue register					
Rev.	Date	Description	Rev.	Date	Description	Dwn.	Chkd.	Apprd.
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Drawing Title: PROPOSED ROAD FRONT ELEVATION

Date:	Scale:
15.12.10	1:250
Drawn By: MB	Checked By: IB

Client: ERAS ECO LTD, FOXHOLE, YOUGHAL

Job Description: INTRGRATED WASTE MANAGEMENT FACILITY

Project No:	Drawing Ref:	Rev:
10P521	200	

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APPENDIX I

PRESS RELEASE

€10m Investment for Youghal Waste Recovery Plant

10 new jobs to be created

Eras Eco, the Cork based waste treatment and recycling plant, has announced plans for a €10 million investment in new environmentally friendly technology at its site at Foxhole, Youghal. 10 new full-time jobs will be created once the new facilities are commissioned in addition to approximately 20 jobs during the construction and installation phase.

The key element will be a new green and renewable system for the safe and complete destruction of aqueous organic waste that has been developed by Cork based environmental company, Super Critical Fluids International (SCFI). This innovative system, known as AquaCritox®, has been extensively developed and tested in Ireland and Sweden over the past five years.

The system employs super critical water oxidation technology to provide 100% destruction of organic wet waste converting it into clean water. AquaCritox® does not generate any odours or harmful emissions or residues. This innovative process is carried out in water and generates steam that can be used to make renewable electricity or used elsewhere on the site. The adoption of the AquaCritox® technology will allow Eras Eco to convert the waste streams safely and efficiently into renewable energy thus displacing imported energy.

The company additionally plans to further develop its green energy credentials with the construction of an above ground anaerobic digestion facility on the site to allow for enhanced treatment of bio-solids. The resultant production of methane gas will be used to produce electricity for use on site through a combined heat and power generator.

The upgraded facilities will utilise existing buildings and plant on the site. There will be no increase in the amount of waste permitted under existing permissions and no new entrance points to the site required.

Parsons Engineering's Cork office will perform the design and manage the construction of the AquaCritox® plant which will be built in Cork by Rockwell Automation (formerly Proscon).

To facilitate the development, Eras Eco has applied for planning permission to allow for the upgrading of the existing Waste Recovery Facility to an Integrated Waste Management Facility.

Separately a review of the current Waste License will be applied for from the Environmental Protection Agency.

The planning application may be inspected or purchased at the offices of Cork County Council, County Hall, Carrigrohane Road, Cork during public opening hours, 9am - 4pm, Mondays to Fridays. Any submissions or observations may be made in writing over the five week period from the date of the planning application (x December 2010).

About ERAS ECO

ERAS ECO is an innovative waste management company specialising in the treatment of waste water treatment plant sludges and materials recycling within a single facility. The specialised Sludge Drying Facility located in Foxhole, Youghal, Co Cork has a Waste License for 110,000 tonnes of various waste streams including the treatment of 30,000 tonnes per annum of sludge from industrial and municipal waste water treatment plants. The plant operates to the highest environmental and legislative standards and provides a unique facility for its many Irish manufacturing customers.

About SCFI Group

SCFI Group is an Irish company that owns the patents and worldwide rights to the super critical water oxidation technology named AquaCritox®. The AquaCritox® product is used in the destruction of wet organic waste. The process has no hazardous or toxic emissions. SCFI Group is actively commercialising this technology on a global basis as a green and sustainable alternative to incineration and other disposal methods.

XX December 2010

For further information, please contact: Frans Van Cauwelaert, 01 669 0030 or 087 9476743 email: frans.vancauwelaert@ogilvy.com

DRAFT LETTERS

1. Neighbours

23rd December 2010

Dear XX,

Following our recent conversation, I am writing to let you know that Eras Eco will be applying for planning permission in order to facilitate the upgrading of our existing Waste Recovery Facility at Foxhole, Youghal to an Integrated Waste Management Facility.

We plan to invest €10 million in new environmentally friendly technology and will create10 new full-time jobs once the new facilities are commissioned in addition to approximately 20 jobs during the construction and installation phase.

The key element of this investment will be a new green renewable system for the safe and complete destruction of aqueous organic waste that has been developed by Cork based environmental company, Super Critical Fluids International (SOH). This innovative system, known as AquaCritox®, has been extensively developed and tested in Ireland and Sweden over the past five years. It employs super critical water oxidation technology to provide 100% destruction of organic wet waste converting it into clean water and steam used to produce renewable electricity. Importantly, it does not generate any odours or harmful emissions or residues.

Additionally, Eras Eco plans to further develop its green energy credentials with the construction of an above ground anaerobic digestion facility on the site to allow for enhanced treatment of bio-solids. The resultant production of methane gas will be used to produce electricity for use on site through a combined heat and power generator.

The upgraded facilities will utilise existing buildings and plant. There will be no increase in the amount of waste permitted under existing permissions and no new entrance points to the site required.

Should you be interested in any further information I would be happy to share the detail of the planning application and the associated Environmental Impact Statement with you, and answer any questions.

I am contactable on 087 255 1404 or by email: pwilson@eras.ie

Yours sincerely,

Paul Wilson

2. Public Representatives

23rd December 2010

Subject: €10 million investment planned for Youghal Waste Recovery Plant

Dear xx,

Eras Eco, the Cork based waste treatment and recycling plant, will today announce plans for a €10 million investment in new environmentally friendly technology at our site at Foxhole, Youghal. 10 new full-time jobs will be created once the new facilities are commissioned in addition to approximately 20 jobs during the construction and installation phase.

To facilitate this development, we will be applying to Cork County Council for planning permission to allow for the upgrading of the existing Waste Recovery Facility to an Integrated Waste Management Facility.

The key element of the planned new investment will be a new green renewable system for the safe and complete destruction of aqueous organic waste that has been developed by Cork based environmental company, Super Critical Fluids International (SCFI). This innovative system, known as AquaCritox®, has been extensively developed and tested in Ireland and Sweden over the past five years. It employs super critical water oxidation technology to provide 100% destruction of organic wet waste converting it into clean water and steam used to produce renewable electricity. Importantly, it does not generate any odours or harmful emissions or residues.

Additionally, Eras Eco plans to further develop its green energy credentials with the construction of an above ground anaerobic digestion facility on the site to allow for enhanced treatment of bio-solids. The resultant production of methane gas will be used to produce electricity for use on the site through a combined heat and power generator.

The upgraded facilities will utilise existing buildings and plant. There will be no increase in the amount of waste permitted under existing permissions and no new entrance points to the site required.

Should you be interested in any further information I would be happy to share the detail of the planning application and the associated Environmental Impact Statement with you, and answer any questions.

I am contactable on 087 255 1404 or by email: pwilson@eras.ie

Yours sincerely,

Paul Wilson

3. Youghal Town Council/Youghal Chamber

23rd December 2010

Subject: €10 million investment planned for Youghal

Dear xx,

I am pleased to inform you that Eras Eco will today announce plans for a €10 million investment in new environmentally friendly technology at our waste treatment and recycling site at Foxhole, Youghal. 10 new full-time jobs will be created once the new facilities are commissioned in addition to approximately 20 jobs during the construction and installation phase.

To facilitate this development, we will be applying to Cork County Council for planning permission to allow for the upgrading of the existing Waste Recovery Facility to an Integrated Waste Management Facility.

The key element of the planned new investment will be a new green renewable system for the safe and complete destruction of aqueous organic waste that has been developed by Cork based environmental company, Super Critical Fluids International (SCFI). This innovative system, known as AquaCritox®, has been extensively developed and tested in Ireland and Sweden over the past five years. It employs super critical water oxidation technology to provide 100% destruction of organic wet waste converting it into clean water and steam used to produce renewable electricity. Importantly, it does not generate any odours or harmful emissions or residues.

Additionally, Eras Eco plans to further develop its green energy credentials with the construction of an above ground anaerobic digestion facility on the site to allow for enhanced treatment of bio-solids. The resultant production of methane gas will be used to produce electricity for use on the site through a combined heat and power generator.

The upgraded facilities will utilise existing buildings and plant. There will be no increase in the amount of waste permitted under existing permissions and no new entrance points to the site required.

Should you be interested in any further information I would be happy to share the detail of the planning application and the associated Environmental Impact Statement with you, and answer any questions.

I am contactable on 087 255 1404 or by email: pwilson@eras.ie

Yours sincerely,

Paul Wilson

4. Suppliers

23[1d] December 2010

Dear xx,

I am pleased to inform you that Eras Eco will today announce plans for a €10 million investment in new environmentally friendly technology at our waste treatment and recycling site at Foxhole, Youghal. 10 new full-time jobs will be created once the new facilities are commissioned in addition to approximately 20 jobs during the construction and installation phase. We also expect that the development will potentially increase our level of business with you/your company over the coming years.

To facilitate this development, we will be applying to Cork County Council for planning permission to allow for the upgrading of the existing Waste Recovery Facility to an Integrated Waste Management Facility.

The key element of the planned new investment will be a new green renewable system for the safe and complete destruction of aqueous organic waste that has been developed by Cork based environmental company, Super Critical Fluids International (SCFI). This innovative system, known as AquaCritox®, has been extensively developed and tested in Ireland and Sweden over the past five years. It employs super critical water oxidation technology to provide 100% destruction of organic wet waste converting it into clean water and steam used to produce renewable electricity. Importantly, it does not generate any odours or harmful emissions or residues.

Additionally, Eras Eco plans to further develop its green energy credentials with the construction of an above ground anaerobic digestion facility on the site to allow for enhanced treatment of bio-solids. The resultant production of methane gas will be used to produce electricity for use on the site through a combined heat and power generator.

The upgraded facilities will utilise existing buildings and plant. There will be no increase in the amount of waste permitted under existing permissions and no new entrance points to the site required.

Should you be interested in any further information I would be happy to share the detail of the planning application and the associated Environmental Impact Statement with you, and answer any questions.

I am contactable on 087 255 1404 or by email: pwilson@eras.ie

Yours sincerely,

Paul Wilson

5. Key Customers

23rd December 2010

Dear xx,

I am pleased to inform you that Eras Eco will today announce plans for a €10 million investment in new environmentally friendly technology at our waste treatment and recycling site at Foxhole, Youghal. 10 new full-time jobs will be created once the new facilities are commissioned in addition to approximately 20 jobs during the construction and installation phase.

To facilitate this development, we will be applying to Cork County Council for planning permission to allow for the upgrading of the existing Waste Recovery Facility to an Integrated Waste Management Facility which will provide greatly enhanced services for our customers.

The key element of the planned new investment will be a new green renewable system for the safe and complete destruction of aqueous organic waste that has been developed by Cork based environmental company, Super Critical Fluids International (SCFI). This innovative system, known as AquaCritox®, has been extensively developed and tested in Ireland and Sweden over the past five years. It employs super critical water oxidation technology to provide 100% destruction of organic wet waste converting it into clean water and steam used to produce renewable electricity. Importantly, it does not generate any odours or harmful emissions or residues.

Additionally, Eras Eco plans to further develop its green energy credentials with the construction of an above ground anaerobic digestion facility on the site to allow for enhanced treatment of bio-solids. The resultant production of methane gas will be used to produce electricity for use on the site through a combined heat and power generator.

The upgraded facilities will utilise existing buildings and plant. There will be no increase in the amount of waste permitted under existing permissions and no new entrance points to the site required.

We will be discussing the advantages of these innovative new technologies with you in due course. In the meantime, should you be interested in any further information I would be happy to share the detail of the planning application and the associated Environmental Impact Statement with you, and answer any questions.

I am contactable on 087 255 1404 or by email: pwilson@eras.ie

Yours sincerely,

Paul Wilson

6. Enterprise Ireland — Sample Letter from SCFI

23rd December 2010

Mort O'Connor
Enterprise **Ireland**

Dear Mort,

I am writing to inform you of an important development for Super Critical Fluids International (SCFI).

Eras Eco, the Cork based waste treatment and recycling plant, will today announce plans for the installation of our AquaCritox® System at its waste treatment and recycling site at Foxhole, Youghal. 10 new full-time jobs will be created once the new facilities are commissioned in addition to approximately 20 jobs during the construction and installation phase.

To facilitate this development, they will be applying to Cork County Council for planning permission to allow for the upgrading of the existing Waste Recovery Facility to an Integrated Waste Management. Separately a review of the current Waste License will be applied for from the Environmental Protection Agency.

The upgraded facilities will utilise existing buildings and plant. There will be no increase in the amount of waste permitted under existing permissions and no new entrance points to the site required.

Parsons Engineering's Cork office will perform the design and manage the construction of the AquaCritox® plant which will be built in Cork by Rockwell Automation (formerly Proscon). All going well, the system should be operational within a year of the start date.

I am attaching a copy of the press release for your information and would be very pleased to provide any further detail you may require.

Yours sincerely,

David Kerr
Chief Operating Officer

APPENDIX 2

SCFI
SMARTER ENVIRONMENTAL TECHNOLOGIES

Environmental

AQUA CRITOX®

Sustainable sludge handling for the 21st Century

AQUA CRITOX®

Purification of municipal and industrial waste waters leads to the generation of a residue-called “excess sludge”. This material when mechanically dewatered is typically 75-90% water.
The balance of the dewatered sludge consists of organic compounds (solid waste, biomass) and inert materials (sand, salts, and metals).
These sludges have been to date dehydrated to reduce the aqueous fraction using thermal dryers or subjected to other treatment regimes such as composting or alkali addition to render the material acceptable for subsequent disposal.
Treated material has been typically disposed of through the practice of land spreading in agriculture, or by placement in landfill or incineration.
Increasing costs and reduction in land bank availability has caused sludge generators to seek alternative disposal routes for their sludges.
Aqua Critox® offers the total solution to sludge handling.

Alum sludges generated from potable water clarification are typically dewatered and placed in landfill at increasing cost.
Using Aqua Critox® it is possible to recover the coagulant for recycling.

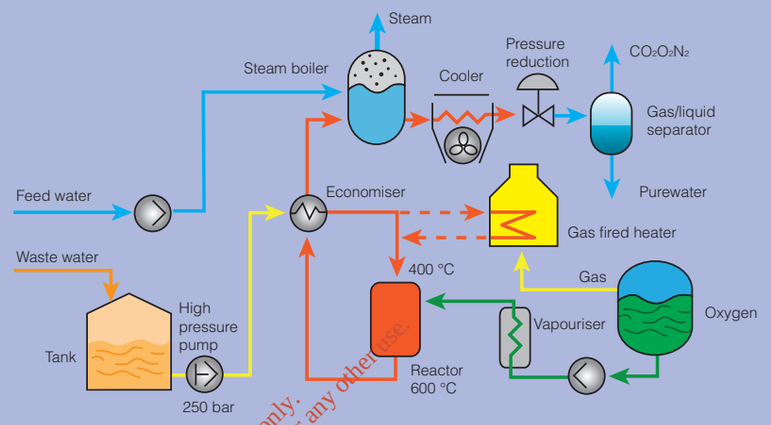
Sustainable sludge handling for the 21st century.

Sewage sludge is reduced to an inert mineral residue.

AQUA CRITOX®

Aqua Critox® ™ Sustainable sludge handling for the 21st century

The Aqua Critox® process uses the unique properties of supercritical water to completely oxidise all organic contaminants from sewage or drinking water sludge. The effluent is separated into a clean water phase and a pure inorganic phase. The inorganic phase is treated in a subsequent step to recover either or both of phosphorous and coagulant. All that remain is a small fraction of inert material that can be utilised as a construction material or landfilled as non-hazardous material.



Process Schematic

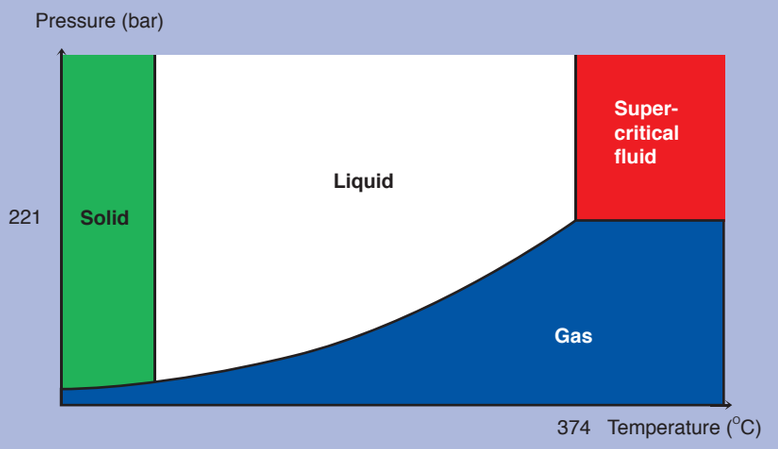
The Aqua Critox®™ Technology

The Aqua Critox® ™ technology was developed for the complete destruction of organic material in sewage and drinking water sludge followed by recovery of phosphorous and coagulant from the inorganic residue. The process is based on SCFI's extensive knowledge of supercritical water and their Aqua Critox ®SCWO process.

The recovery process.

The sludge is passed through the Aqua Critox® plant, where, under supercritical conditions, oxygen is added and the organics are destroyed, producing clean water containing a fine particulate phase of inorganic material. The inorganic phase can easily be separated from the water phase, through thickening or dewatering, and treated in a subsequent step to recover either or both of coagulant and phosphorous.

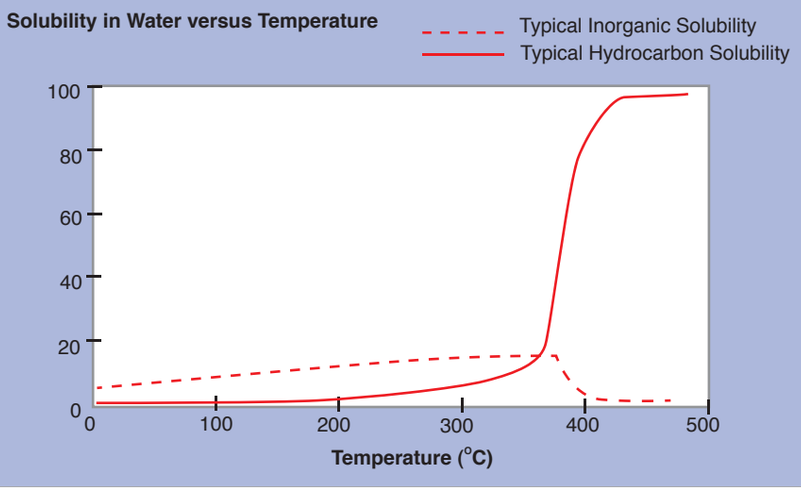
www.aquacritox.ie



Phase Diagram

AQUA CRITOX®

Sludge to clear water

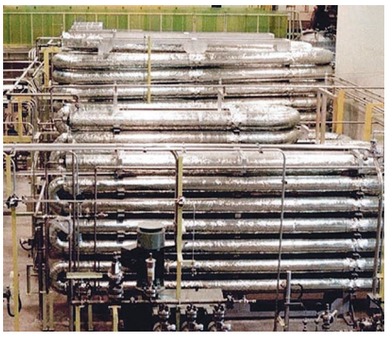


Why chose Aqua Critox® ?

Facts about Aqua Critox®™

Technology

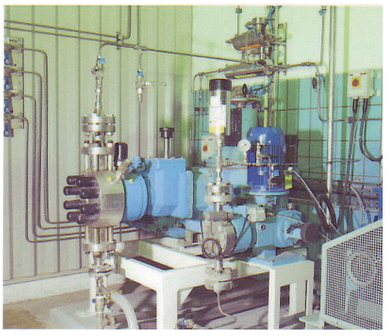
- Rapid & complete destruction of organics.
- No harmful by-products.
- No exhaust gas cleaning requirements.
- Continuous process.
- Easily recoverable coagulants and phosphorous.
- Phosphorous can be selectively extracted.
- Can be applied to both sewage and drinking water sludge.
- Full CO_2 recovery as liquid for resale.
- Total conversion of organics to CO_2 , H_2O , N_2



Tubular Reactor

Summary of Advantages

- A continuous exothermic process with potential to generate renewable electricity and heat.
- The recovery of by-products (i.e. coagulants, phosphorous and carbon dioxide) results in little if any residual materials.
- The purity of the carbon dioxide by-product offers the potential for industrial use.
- The residual materials are non hazardous.
- Permitting requirements are not demanding.
- The process does not fall under the waste incineration directive.
- The plant can process 3% to 25% dry solid content.
- Reduces over all carbon foot print of works.
- It may reduce or eliminate flocculent use for dewatering.
- There are no odour issues.
- On site installation eliminates haulage movements.
- The foot print is small.



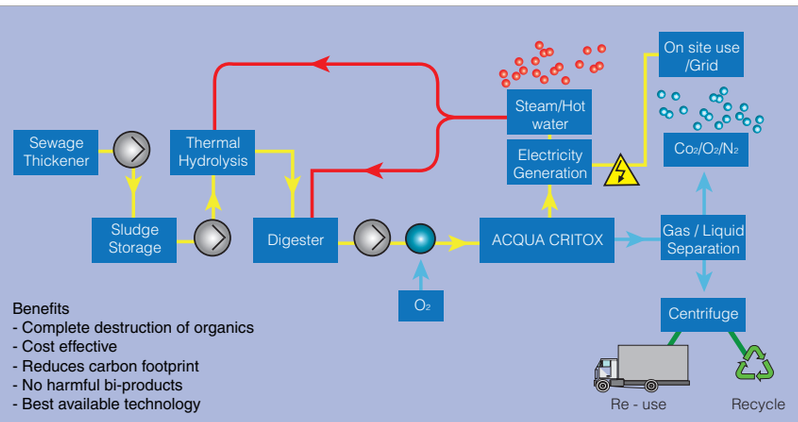
Feed Pump

AQUA CRITOX®

Destruction of sludge with respect for the environment.

Aqua Critox®
For digested and raw sludge.

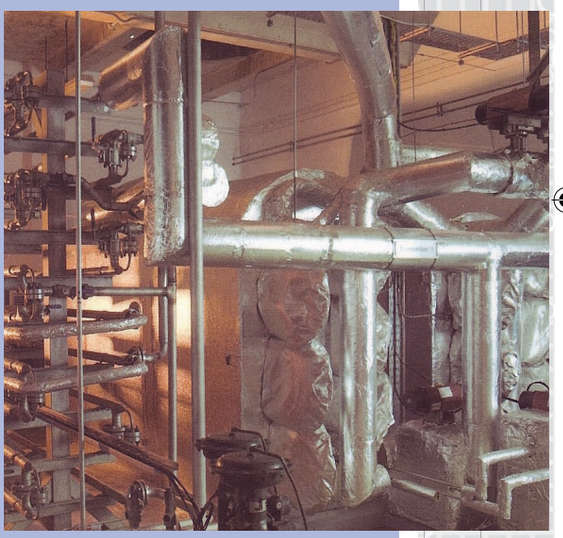
Aqua Critox®
Can eliminate requirement for anaerobic digesters if required.



Benefits
- Complete destruction of organics
- Cost effective
- Reduces carbon footprint
- No harmful bi-products
- Best available technology

Electricity Generation

Aqua Critox® offers the ability to generate electricity from even digested sludge.



Part of the validation facility

SCFI
SMARTER ENVIRONMENTAL TECHNOLOGIES

Offer to customers a technically and economical solution to sludge treatment.

The process is controlled by sophisticated software.

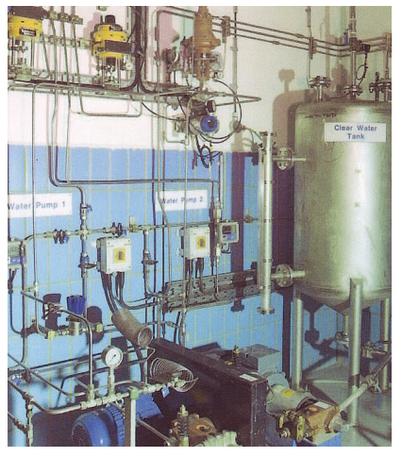
www.aquacritox.com

AQUA CRITOX®

Treatment of Industrial sludges & waste streams.

The Aqua Critox® process will handle biodegradable and non biodegradable organic streams.

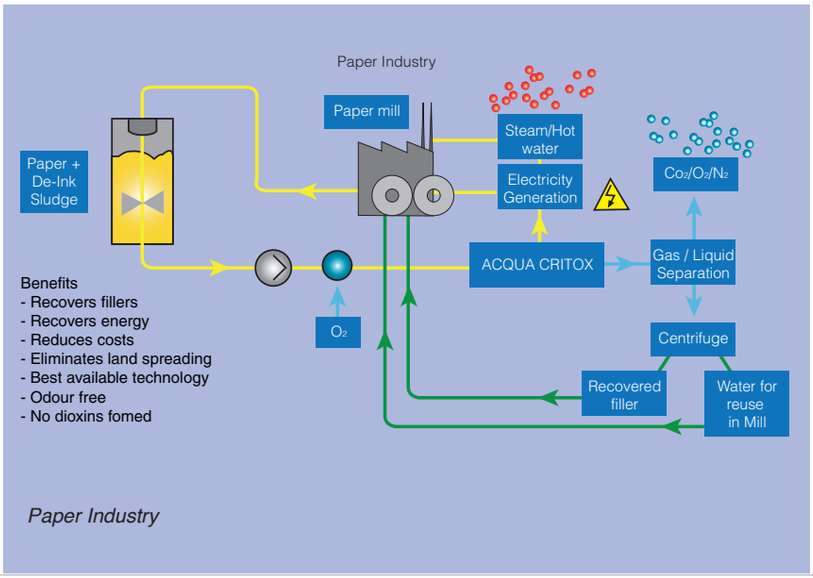
- 30g/L - 200g/ltr COD range
- The generation of electricity is possible where COD > 100g/ltr and volume > $3M^3/hr$
- Effluent from the process will have a COD < 5ppm
- All inorganics are easily separated as non- ash-like material for reuse
- Off gas is N_2 & O_2



Who will benefit from use of Aqua Critox® ?

- Chemical/Pharmaceutical & Petrochemical Industry
- Bio Pharma
- Paper Industry
- Toll treatment facilities
- Sewage treatment plants
- Food waste generator/ processor
- Catalyst recovery
- Electronic scrap processor

De-inking sludge with filler recovery



Paper Industry

For the Paper Industry

- Filler recovery
- Electricity generation
- Steam/hot water generation

AQUA CRITOX®

Phosphorus & Coagulant recovery.

The Aqua Critox® Technology

The Aqua Critox® technology was developed for the complete destruction of organic material in sewage and drinking water sludge followed by recovery of phosphorous and coagulant from the inorganic residue. The process is based on SCFI's extensive knowledge of supercritical water and their Aqua Critox® SCWO process. The sludge is passed through the Aqua Critox® plant, where, under supercritical conditions, oxygen is added and the organics are destroyed, producing clean water containing a fine particulate phase of inorganic material. The inorganic phase can easily be separated from the water phase, through thickening or dewatering, and treated in a subsequent step to recover either or both of coagulant and phosphorous.

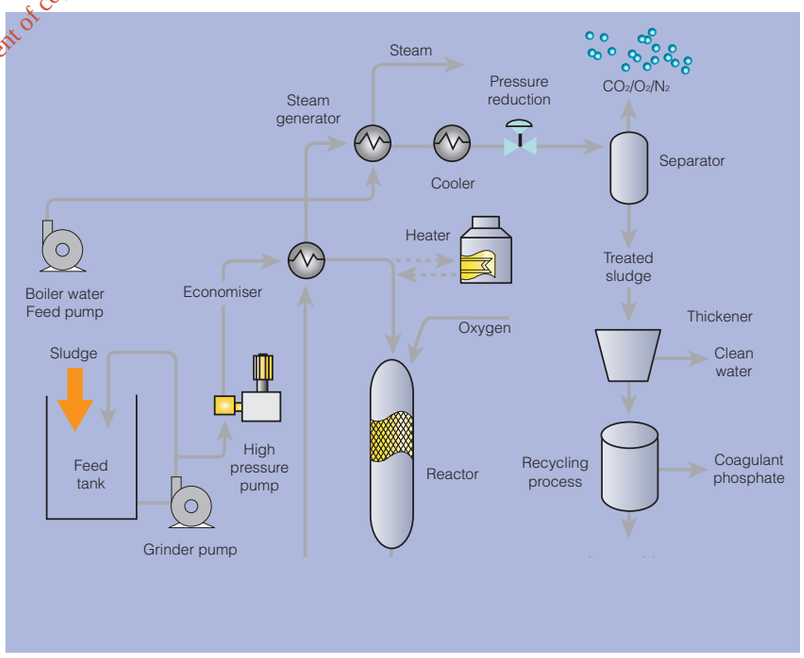
Facts about the Aqua Critox® Technology

- Rapid & complete destruction of organics
- No harmful by-products
- No exhaust gas cleaning requirements
- Continuous process
- Easily recoverable coagulants and phosphorous
- Phosphorous can be selectively extracted
- Can be applied to both sewage and drinking water sludge

Benefits of Aqua Critox®

- Low consumption of chemicals
- Good heat recovery
- Compact design
- No incineration - Easier permitting

Sewage sludge before and after treatment.



Simplified Aqua Critox™ process flow scheme.

www.aquacritox.com

AQUA CRITOX®

SMARTER ENVIRONMENTAL TECHNOLOGIES

SCFI Group
Rubicon Centre, CIT Campus, Bishopstown, Cork, Ireland.

T +353 21 492 8900
E info@scfi.eu
W www.scfi.eu

www.aquacritox.com

SCFI
SMARTER ENVIRONMENTAL TECHNOLOGIES

Environmental

AQUA CRITOX®

Sustainable sludge handling for the 21st Century

AQUA CRITOX®

Purification of municipal and industrial waste waters leads to the generation of a residue-called “excess sludge”. This material when mechanically dewatered is typically 75-90% water.
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