Unit 15
Melbourne Business Park
Model Farm Road
Cork

O'Callaghan Moran & Associates
ENVIRONMENTAL MANAGEMENT FOR BUSINESS

T: 021 434 5366
E: info@ocallaghanmoran.com
www.ocallaghanmoran.com

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

29th September 2017.

Re: Application for Licence Reg No: W0211-02

Dear Ms Oglesby,

In reviewing the information submitted with the application we noticed that the details on the site infrastructure and plant and equipment referenced in the Environmental Liability Risk Assessment (ELRA) and Decommissioning Management Plan (DMP) were incomplete, that all of the environmental risks associated with the proposed activities had not been assessed and that the location of the back-up flare associated with the Combined Heat and Power plant is not shown on any of the drawings.

The revised ELRA and DMP are in Attachments 1 and 2. The ELRA takes into consideration leaks/spills from the digestate pasteurisation tanks in Building 1 that will be used to pasteurise digestate from feed stock containing Animal By-Products. The DMP now includes for the decommissioning of the reciprocating internal combustion engine CHP plant, the associated gas flare, and the centrifuge. The latter will be used do dewater the digestate to produce a liquor and fibre.

The emission point drawing has been revised (Drawing No. 15-193-03 Rev E) to show the location of the back-up gas flare. As the flare will only be used intermittently during the routine maintenance of the CHP plant, air dispersion modelling of the emissions is not required.

Yours Sincerely,

Jim O' Callaghan

ATTACHMENT 1

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ENVIRONMENTAL LIABILITY RISK ASSESSMENT

ERAS ECO LIMITED

FOXHOLE

YOUGHAL

CO. CORK

INDUSTRIAL EMISSIONS LICENCE NO. W0211-01

Prepared For: -

ERAS ECO Ltd.,
Foxhole,
Youghal,
Co. Cork

Prepared By: -

O' Callaghan Moran & Associates
Unit 15,
Melbourne Business Park,
Model Farm Road,
Cork

September 2017

Project	Environmental Liability Risk Assessment
Client	ERAS ECO Limited

Report No	Date	Status	Prepared By	Reviewed By
1519301	27/03/2017	Draft	Martina Gleeson PhD.	Jim O'Callaghan MSc, CEnv, MCIWM, IEMA
	06/04/2017	Final		
	26/09/2017	Final Rev A		

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1. INTRODUCTION

1.1 Activity Details

ERAS ECO Ltd (ERAS ECO) is Cork's leading sludge management company and has been operating its facility at Foxhole, Youghal since 2007. The facility operates under an Industrial Emissions Licence (W0211-01) issued by the Environmental Protection Agency (Agency) and treats sewage sludge from local authority sewerage treatment plants and non-hazardous sludges from industrial waste water treatment plants operating mainly in the Cork area.

ERAS ECO has applied to the Agency for a review of the Licence to allow the construction of an Anaerobic Digestion (AD) Plant and associated Combined Heat and Power (CHP) plant, and to increase the amount of waste that can be treated.

The Agency requested ERAS ECO to prepare an Environmental Liabilities Risk Assessment (ELRA) as part of the application for a review of the licence. ERAS ECO appointed O'Callaghan Moran & Associates (OCM) to prepare the ELRA.

1.2 Methodology

The assessment was based on the Agency's '*Guidance on assessing and costing environmental liabilities' (March 2014).* The ELRA has been prepared to accurately reflect the risks of unplanned, but plausible incidents occurring.

The assessment included:

- An assessment of site operations, including materials and product handling and storage practices; production processes; process waste management; emission control and management (infrastructural and procedural); accident prevention policy and emergency response procedures;
- Determining the environmental setting and the identification of any particular sensitive receptors that could be impacted in the short, medium and long term by the site operations;
- Establishment of the site history and regulatory compliance performance.

2. SCOPING

The ELRA addresses the liabilities from past and present activities. In this regard, all aspects of the historic and the licensable activities licence that pose a plausible risk to the environment are described and evaluated.

3. RISK IDENTIFICATION

3.1 Site Operation

3.1.1 Size and Nature of the Activity

The installation occupies almost 1.6 hectares and is approximately 2km from Youghal, adjacent to the former Youghal Landfill. The current Licence authorises the acceptance of 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

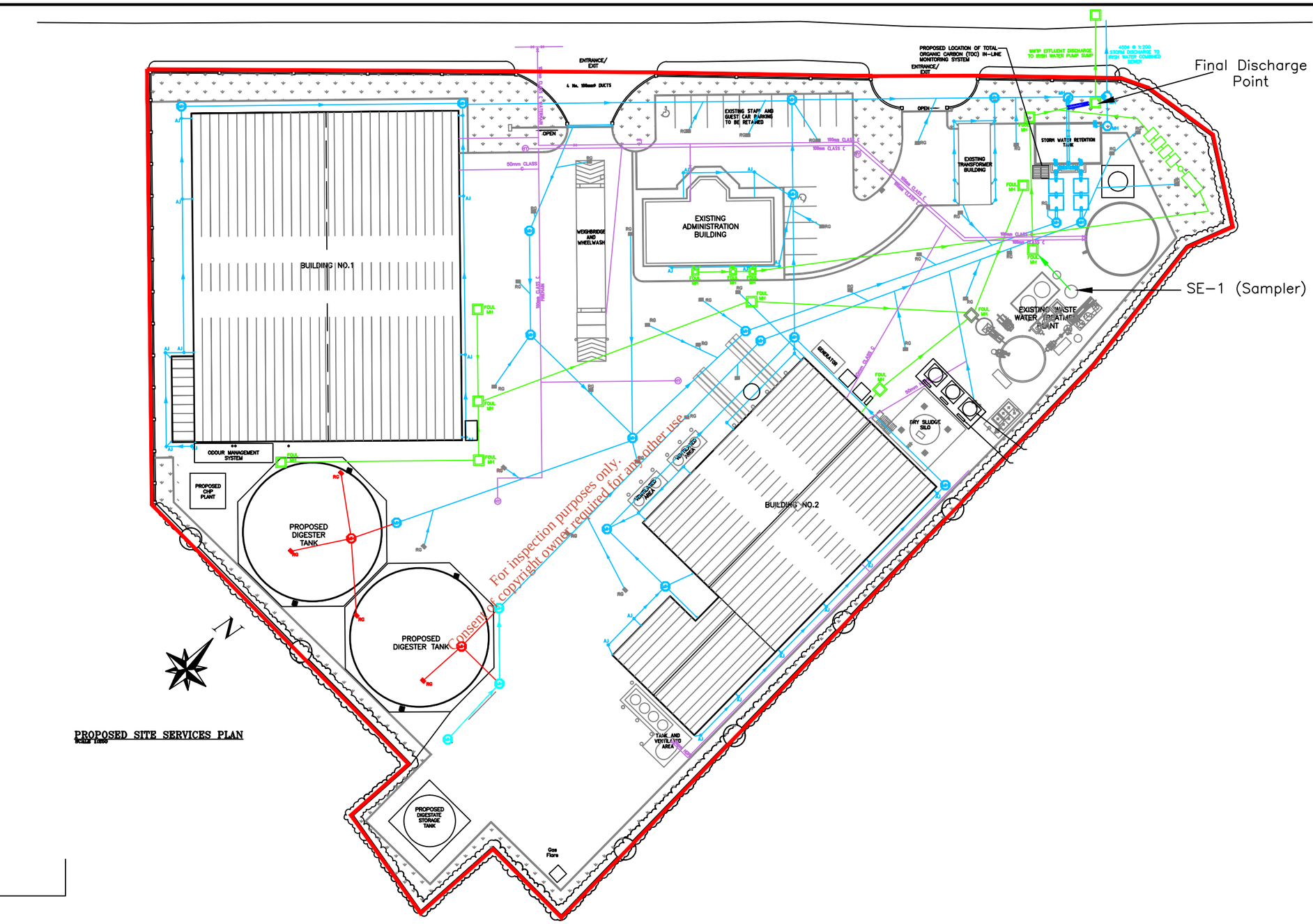
The proposed changes will reduce the overall quantities of waste to 65,000 tonnes/year, which will include:

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

The proposed site layout is shown on Drawing No. 15-193-02 Rev C and details of the infrastructure are presented in Table 3.1 and fixed plant is in Table 3.2.

Table 3.1 – Site Infrastructure

Infrastructure	Details
Administration Building	Two storey (106 m^2) building, houses reception, offices, canteen, toilet & changing rooms, laboratory, public information room
Weighbridges	Precia molen 16M weighbridge located at entrance to access gate.
Building 1	Sludge storage area, biomass/woodchip storage area, workshop
Building 2	Sludge reception area, sludge drying area
WWTP	Balance tank, culligan filters, carbon, filters, hypochlorite mixing tanks, other tanks: treated water, wash water, sludge.
Anaerobic Digesters	2 No. each 2,208m^3.
Liquid Waste Storage Tank	6.No. each 100m^3 and located inside Building 1
Digestate Pasteuriser Tanks	2 No. each 25m^3 and located inside Building 1
CHP Plant	2 No. reciprocating internal combustion engines located south-west of Building 1
Gas Flare	1 No. Back up for flare for CHP plant, located south-west of Building 2
Transformer Building	Houses transformer
Water Storage Tanks	Firewater Storage Tank, Stormwater Retention Tank
Oil Storage Tank	Diesel Oil – Capacity 2,600 litres, double skinned tank.



O' Callaghan Moran & Associates.
Unit 15 Melbourne Business Park
Model Farm Road, Cork, Ireland.
Tel. (021) 4345366
email: info@ocallaghanmoran.com

CLIENT

Eras Eco

TITLE

Site Services

DRAWING No.

15-193-02

REV.

C

Table 3.2 Fixed Equipment

Items
Feed hopper and conveyor
Pumps and feed lines
Fire and intruder alarm system
Fire sprinkler system
Odour Control Systems in Building 1 (carbon treatment) and Building 2 (scrubber and biofilters)
Wastewater treatment plant
Fuel pump and fuel management system
Biomass Boiler
Rotary Dryer

3.1.2 Site History

Historical reclamation work in this area has resulted in made ground with a proven thickness of up to 3m. Site investigations identified the made ground to be predominately clay with small portion of construction and demolition waste.

The site was initially used by Youghal Town Council to store diesel for vehicles operating on the adjacent Youghal Landfill. It is understood the tanks were located in the vicinity of the current site entrance.

Youghal Waste Disposal & Recycling Ltd acquired a 35-year lease from the landowner-Youghal Town Council, before subletting it to AVR Environmental Solutions Ltd. In 2001, 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).

ERAS ECO Ltd was established to compensate for the lack of recovery facilities within Ireland at the time. In particular, its focus was the treatment of wastewater treatment plant (WWTP) sludges and the recovery of Commercial and Industrial (C&I) wastes. ERAS ECO Ltd acquired the plant in 2006. The Waste Licence was granted in November 2006 and the facility was constructed and commissioned in 2007.

3.1.3 Site Processes

Sludge Treatment

The treatment processes comprise reducing the moisture content and pasteurisation using either a biomass fuelled dryer, 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 dryer, 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 2.

The building is fitted with interlocked rapid roller doors providing efficient containment of odours within the building. The steam from the dryer 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 dryer 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.

Anaerobic Digestion

The plant will comprise six liquid storage tanks, two pasteuriser tanks and a feed hopper and conveyor located in Building 1, and two digester tanks and a digestate storage tank located in the south of the site. The digesters will be enclosed by an impermeable cover and heated to 37˚C and will be continuously stirred and fed with sludges. This process will produce a biogas and a digestate.

The biogas will contain approximately 65% methane, which will then be treated and either used as a fuel in the new CHP plant or exported to the national gas grid. Where the feed stock includes animal by-products, the digestate will be pasteurised to facilitate its use as a fertiliser.

The pasteurisation process will comply with the Animal By-Product Approval issued by the Department of Agriculture, Food and Marine

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

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

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

Wastewater Treatment Plant

The plant is designed to treat condensate from the sludge dryer, landfill leachate and wash water from the wheel wash. It comprises a balance tank with an air diffuser, a dissolved air floatation tank, carbon and sand filters, lamella settlement unit, hypochlorite treatment and a sludge storage tank.

Treatment of Yeast Slurries and Whey Permeates

At some time in the future ERAS ECO may accept and treat yeast slurries to manufacture animal nutrition ingredients. Only whey permeates that have been accepted by the Agency as being by-products will be accepted at the installation. Given the quality control requirements the drying will be carried out in a new building, which will require planning permission. The exhaust from the new dryer will be ducted to existing stack and details will be submitted to the Agency by way of an SEW.

3.2 Site Security

There is a concrete block wall along part of the eastern boundary and the remainder of the site is surround by a fence. The fence is inspected regularly and any damage observed is repaired promptly. The site is accessed via electric security gates. There is a security alarm on the administration building.

3.3 Services

The installation obtains water from the mains supply provided by Irish Water. Sanitary wastewater is treated in the on-site waste water treatment system and discharged to a combined Irish Water sewer that outfalls to the Blackwater River Estuary.

3.4 Foul Water Drainage System

Wastewater generated at the installation includes sanitary wastewater from the offices and process waste water. The sanitary wastewater is treated in a proprietary treatment system (Puraflo ©) adjacent to the northern site boundary, before being discharged to the Irish Water combined sewer that outfalls to the estuary.

Process wastewater comprising condensate from the rotary sludge dryer and wash water from the wheel wash is treated in an on-site process waste water treatment plant (WWTP) comprising, pH adjustment, a balance tank, dissolved air floatation unit, carbon and sand filters, lamella settlement unit, hypochlorite treatment and a sludge storage tank. Currently the treated effluent is discharged to the Irish Water combined sewer that outfalls to the estuary.

3.5 Surface Water Drainage System

The operational yards are paved with concrete and surrounded by a kerb. There is a concrete block wall along part of the eastern boundary. Rainwater run-off from roofs and non-waste storage paved areas is collected in the surface water drainage system that connects to two silt/ oil interceptors (Class 1) and a storm water retention tank.

The run-off is reused on-site when possible (wheel wash, the bio-filter, cooling water for the dry product and to backwash the wastewater treatment plant filters) and the surplus water discharges to the Irish Water combined sewer via a retention tank and a non-return valve. The sewer outfalls to the estuary.

3.6 Inventory of Raw Materials and Wastes

Diesel is stored in a plastic double skinned tank (2,600 litres) adjacent to the southern end of Building 2. The liquid sulphuric acid, sodium hypochlorite and sodium hydroxide used in the process wastewater WWTP are stored in four Intermediate Bulk Containers (IBC) in a bunded Chemstore adjacent to the WWTP. The unit has a 1,200 litre polythene collection sump. Leachate will be delivered in road tankers and pumped directly into the WWTP balance tank. The maximum amount materials and wastes on site at any one time are shown in Table 3.3.

Table 3.3 – Materials Inventory

Wastes/Products	Quantity Stored
Untreated Sludge for Drying	250 tonnes
Untreated Liquid Waste	600 tonnes
Contents of Digesters	4496 tonnes
Digestate	500 tonnes
Landfill Leachate (for WWTP)	25 tonnes
Quarantine Waste	1 tonne
Woodchip (for Boiler)	20 tonnes
Diesel (for Boiler)	2,600 litres
Hydraulic Oil	205 litres
Engine Oil	100 litres
Liquid Alum (for WWTP)	1 tonne
Flopam FO 4107 (for WWTP)	0.8 tonnes
Sulphuric Acid (for WWTP)	1 tonne
Soda Ash (for WWTP)	1 tonne
Sodium Hydroxide Solution (for WWTP)	1 tonne
D-10 (Detergent/Disinfectant)	60 litres

3.7 Environmental Emissions

There is one (1 No.) emission point to the surface water (SW-1). There is one (1 No.) emission to sewer (SE-1). There are three (3 No.) existing point emissions to air, which are the boiler stack, the biofilters and the odour control unit in Building 1. The proposed development will result in one continuous new emission point to air, which will be the stack on the CHP plant and one intermittent emission point, which will be the back-up gas flare.

Site operations are a source of noise and the licence specifies noise emission levels for the nearest noise sensitive locations. Operations are also a potential source of dust emissions and the licence specifies dust deposition limits.

3.8 Emergency Response

ERAS ECO has adopted an Emergency Response Procedure (ERP) that identifies potential hazards at the site that may cause damage to the environment and also specifies the roles, responsibilities and actions required to deal quickly and efficiently with all foreseeable major incidents and to minimise environmental impacts.

3.9 Operator Performance

3.9.1 Facility Management & Staffing Structure

The Facility Manager has over 12 years' experience in Waste Management and holds a Certificate in FAS Waste Management Training Course. The Environmental, Health & Safety Manager has 7 years' experience in EHSQ and holds a BSc in environmental management, a

Certificate in Safety & Health and a NEBOSH Safety Diploma. All operatives are provided with the appropriate and necessary training to complete their assigned tasks.

3.9.1 Compliance History

In 2016 ERAS ECO received notifications of non-compliances regarding waste storage practices, dewatering of sludge, use of waste wood as a fuel, maintenance of the drainage system and stormwater diversion.

3.9.2 Enforcement History

The facility has never been the subject of any enforcement action taken by the regulatory authorities.

3.9.3 Incidents History

There have been no incidents that had the potential to result in significant soil and groundwater contamination.

3.9.4 Complaints History

In 2015 odour complaints were received and an investigation identified these were associated with the emissions from the biofilter. The duct work had become corroded and the emission point was at a relatively low level. The corrective actions included the replacement of the ducting and extending it to and up the southern elevation of Building 2 to a level where the emission point is above the roof height. This was completed in 2015 and resulted in a reduction in the number of complaints.

In 2016 three complaints were received (15th and 16th March and 8th June) and all were investigated. The potential source of the March complaints were opening the doors of building for the acceptance of woodchip. The investigation of the June complaint did not identify any source other than the potential loss of negative air pressure in the building after the doors were opened to take a delivery of sludge.

3.10 Environmental Sensitivity

3.10.1 Surrounding Land Use

The installation is approximately 2km from Youghal, adjacent to the former Youghal Landfill. The site and the surrounding area are situated on low lying land reclaimed from the Blackwater Estuary which is known locally as Youghal Mudlands. The northern and western boundaries of the site are defined by a public access road and an adjacent development respectively. The lands to the south and west are undeveloped.

3.10.2 Hydrology

The site is located on reclaimed land to the west of the estuary of the Blackwater River. The Tourig River enters the Blackwater to the north of the site. A drainage ditch, which runs adjacent to the access road to the north-west of the site, receives run-off from the access road

and from reclaimed land to the north-west. There are a number of other drains to the east and south-east of the site, all of which enter the estuary.

Rainwater run-off from roofs and non-waste storage paved areas is collected in the surface water drainage system that connects to two silt/ oil interceptors (Class 1) and a storm water retention tank.

The run-off is reused on-site when possible (wheel wash, the bio-filter, cooling water for the dry product and to backwash the wastewater treatment plant filters) and the surplus water discharges to the Irish Water combined sewer via a non-return valve. The sewer outfalls to the estuary.

3.10.3 Geology & Hydrogeology.

The soils comprise up to 3m of made ground, comprising gravelly clay soils with fragments of plastic (4-5%), wood (1%), glass (2%) and ceramics (2-3%). It is underlain by a stiff gravelly clay that is more than 14m thick. The bedrock underlying the site is Waulsortian Limestone, which consists of massive, unbedded mounds of calcareous deposits in the form of mudstones, wackestones and packstones.

The Geological Survey of Ireland (GSI) has classified the bedrock that underlies the site as a Locally Important Karstified Aquifer. A search of the GSI well database identified one well used for water supply located approximately 5km west of the site (i.e. up-gradient) and has a reported yield of 979m^3/d .

The aquifer vulnerability rating shown on the GSI Vulnerability Map is “High”; however, a site investigation completed in 2007 encountered up to 14m of gravelly clays beneath the site, giving a site specific vulnerability rating of Moderate.

The groundwater flow direction is to the south-east towards the estuary at low tide, but the direction could vary during high tide.

3.10.4 Designated Sites

The Blackwater River and estuary is designated a Special Protected Area (SPA), a Special Area of Conservation (SAC) and a proposed Natural Heritage Area (pNHA). The installation is located outside the designated areas; however, surface water run-off and treated effluent from the installation discharges to the estuary via the Irish Water combined sewer.

4. RISK ANALYSIS

4.1 Installation Design and Operation

The licence conditions require the provision of mitigation measures, both infrastructural and procedural, that effectively minimise the risk of environmental liabilities associated with unplanned events. Such measures, which are subject to regular review by Eras Eco include:

- Provision of an appropriately experienced Facility Management Team and implementation of appropriate staff training programmes;
- Implementation of a site specific Environmental Management System (EMS), including an Environmental Management Programme (EMP);
- Adoption of site specific Accident Prevention Policy and Emergency Response Procedures (ERPs), which will be reviewed annually;
- Provision of impermeable concrete surfaces in areas where wastes are stored and handled;
- Provision of separate surface water drainage system for areas of the site where there is the potential for contamination of the run-off to occur. Run-off from these areas passes through an oil interceptor before discharge to the Irish Water storm sewer;
- Collection and on-site treatment of condensate from the sludge dyer and water from the wheel wash;
- Provision of appropriate secondary containment for the diesel, engine and hydraulic oil and the WWTP treatment chemicals and routine integrity testing of these to ensure that they are fit for purpose;
- Provision and maintenance of appropriate spill response and clean-up equipment in areas where there is a risk of spills occurring;
- Regular site inspections.

4.2 Risk Identification

Environmental liabilities arise from contamination or damage to environmental media (air, surface water, soils and groundwater), which can act as pathways to sensitive receptors. The Agency, in reaching a decision to grant the current licence, concluded that the installation, if designed and operated in accordance with the licence conditions, will not give rise to environmental liabilities.

Therefore, for the purposes of this ELRA, future environmental liabilities are confined to incidents such as fires, explosions, spills and leaks. The receptors that are potentially susceptible to adverse impacts associated with such incidents include, air, soils, groundwater, surface water and nearby commercial activities and residences.

4.3 Plausible Risks

The plausible risks identified at the site are presented in Table 4.1. These take into account the facility history, the controls and mitigating measures that are already in place, with due regard for those controls to contain incidents and for the potential failure of the controls.

Table 4.1 Risks

Risk ID	Process	Potential Hazards/Risks
1	Diesel Storage	Accidental release of diesel from storage tanks - surface water, groundwater and soil contamination
2		Accidental release of diesel during deliveries and dispensing -surface water contamination.
3	WWTP Chemicals Storage	Accidental spill when filling and emptying the IBC - surface water contamination.
4		Accidental spill when filling and emptying the IBC - soil and groundwater contamination.
5	Fire in Building 1 and Building 2	Contaminated firewater generated and released to estuary – surface water contamination
		Contaminated firewater generated and released to estuary – soil and groundwater contamination
6	AD Digesters/Digestate Pasteuriser / Liquid Waste Storage Tanks and Centrifuge	Accidental release of liquor to surface water drains
7		Accidental release of liquor to ground
8	Leachate Treatment	Accidental spill when feeding into WWTP-surface water contamination
		Accidental spill when feeding into WWTP-surface water contamination.
9	WWTP	Leaks/overtopping of treatment tanks and pipework-surface water contamination.
		Leaks /overtopping of treatment tanks and pipework-soil and groundwater contamination.

4.4 Risk Analysis

An assessment of the risks presented by the facility operations was completed taking consideration of site specific characteristics and the Classification Tables for Likelihood and Consequence in the Agency Guidance Document (Ref Table 4.2a and 4.2b).

Table 4.2a – Risk Classification Table (Likelihood)

Risk	Category	Description
1	Very Low	Very low chance of hazard occurring
2	Low	Low chance of hazard occurring
3	Medium	Medium chance of hazard occurring
4	High	High chance of hazard occurring
5	Very High	Very high chance of hazard occurring

Table 4.2b– Risk Classification Table (Consequence)

Risk	Category	Description
1	Trivial	No damage or negligible change to the environment
2	Minor	Minor/localised impact or nuisance
3	Moderate	Moderate damage to the environment
4	Major	Severe damage to the environment
5	Massive	Massive damage to a large area, irreversible in the medium term

The Risk Analysis Form is presented in Table 4.3. The assignation of the severity rating scores takes into consideration the mitigation measures that are already in place. OCM does not consider it plausible that all of the containment and control measures already in place would fail at the time of an incident, as this would require:

a) ERAS ECO to wilfully disregard the licence conditions regarding bund integrity testing; accident prevention and emergency response provisions; inspection and repair of paved areas; maintenance of plant and equipment; staff levels and training, and

b) a failure by the Agency to properly regulate the facility to such an extent that allowed all the control and containment measures to fail.

Table 4.3 Risk Analysis Form

Risk ID	Process*	Potential Risks	Environmental Effect	Likelihood	Basis of Likelihood	Consequence	Basis of Severity
1	Diesel Storage	Uncontrolled release from above ground storage tank that escapes the bund and enters the surface water drains.	Contamination of the surface water drains and the Blackwater Estuary	2	The diesel tank, the bund design and construction complies with licence requirements and has more than 110% capacity of the tank. The bund is subject to regular visual inspection and routine integrity testing and repaired as required. Oil interceptor and shut off-valve on storm water system discharging at SW1. ERP will ensure rapid response to incident, including closing of shut off valves on storm water outlet. The risk is **Low.**	2	Surface water run-off from facility passes through an oil interceptor. In addition, the activation of the shut off valve will contain oil contaminated runoff within the site. Given the limited amount of oil stored on site, the rapid response to an incident and presence of the interceptor, the amount of oil that would enter the storm sewer and consequently the estuary would be negligible. The severity of the impact would be **Trivial**
2	Diesel Storage	Escape of diesel to surface water drainage system during filling/dispensing	Surface water contamination of the sewer and the Blackwater Estuary	2	Oil stored in bunded areas. Documented procedure on refuelling tanks, staff fully trained in spill prevention and clean-up. Oil interceptor and shut off-valve on system discharging at SW1. ERP will ensure rapid response to incident, The risk is **Low.**	1	Surface water run-off from the facility passes through an oil interceptor. Given the rapid response to an incident and presence of the interceptor the amount of oil that would enter the storm sewer and consequently the estuary would be negligible. The severity of the impact would be **Trivial**
3	WWTP Treatment Chemicals	Escape of chemicals to surface water drainage system during filling/emptying the IBC	Contamination of the drainage system and the Blackwater Estuary	2	Chemicals stored in bunded area. Site staff fully trained in spill prevention and clean-up. Shut-off valve on system discharging at SW1. ERP will ensure rapid response to incident. The risk is **Low.**	1	Maximum of 1000 litres of chemicals stored in each IBC. Given the rapid response to an incident and presence of the shut-off valve the amount of oil that would enter the storm sewer and consequently the estuary would be negligible. The severity of the impact would be **Trivial**

Risk ID	Process*	Potential Risks	Environmental Effect	Likelihood	Basis of Likelihood	Consequence	Basis of Severity
4	WWTP Treatment Chemicals	Escape of chemicals to ground during filling/emptying the tank.	Soil/groundwater contamination.	2	The area around the storage unit is paved. Site staff fully trained in spill prevention and clean-up. ERP will ensure rapid response to incident, The risk is **Low.**	1	Subsoils are made ground and not water bearing. Aquifer vulnerability is moderate to low. Bedrock aquifer is Locally Important. Given the rapid response to an incident, the condition of the paving, the amount of oil that would infiltrate to ground would be small. The severity of the impact would be **Trivial**
5	Fire	Smoke emission.	Air pollution.	5	The ERP ensures rapid response to incident. Staff trained in emergency response measures. However if it occurs the risk of smoke emissions is **Very High.**	1	Smoke presents a potential health risk. Surrounding land use primarily commercial. Emergency Service Co-ordinator will make decision on the need to evacuate nearby commercial premises. Could be significant disruption during incident, but no long term effect. The severity of the impact would be **Trivial.**
6	Fire	Escape of firewater to surface water and foul water drainage systems.	Contamination of the Blackwater Estuary.	2	The ERP ensures rapid response to incident. Staff trained in emergency response measures. Shut off valve on the surface water lines. The risk is **Low.**	3	The shut off valve on the surface water drain will contain runoff within the site. The amount of firewater entering the combined sewer would be low and would receive significant dilution before it reached the Blackwater Estuary. The severity of the impact would be **Moderate.**
7	Fire	Infiltration of firewater to ground.	Soil / groundwater contamination.	1	The operational area is paved. Site staff fully trained in spill prevention and clean-up. ERP will ensure rapid response to incident, The risk is **Very Low.**	2	Subsoils are made ground and not water bearing. Aquifer vulnerability is moderate to low. Bedrock aquifer is Locally Important. Given the rapid response to an incident, the condition of the paving, the amount of firewater that would infiltrate to ground would be small. The severity of the impact would be **Minor**

Risk ID	Process*	Potential Risks	Environmental Effect	Likelihood	Basis of Likelihood	Consequence	Basis of Severity
8	AD Tanks/ Digestate, Pasteuriser / Liquid Waste Tanks and Centrifuge	Seepage of liquid leak from tanks to ground due to rupture of tanks or damage as a result of structural failure or explosion	Soil/ Groundwater contamination	1	All operational areas are paved with concrete and surrounded by a perimeter kerb. Routine inspection and repair of damaged paved areas. The tanks will be constructed in 2017. The tanks and pipework will be subject to regular inspection and integrity testing, which will identify any damage and facilitate quick repair. Tanks fitted with a blast release roof to minimise damage in event of explosion. The risk is **Very Low**	2	Subsoils are made ground and not water bearing. Aquifer vulnerability is moderate to low. Bedrock aquifer is Locally Important. Given the rapid response to an incident, the condition of the paving, the amount of liquid that would infiltrate to ground would be small. The severity of the impact would be **Minor**
9	AD Tanks/ Digestate, Pasteuriser / Liquid Waste Tanks and Centrifuge	Entry of liquid to surface water drains due to rupture of tank or damage to pipework as result of structural failure or explosion	Surface water contamination	1	The tanks will be constructed in 2017. The tanks and pipework will be subject to regular inspection and integrity testing, which will identify any damage and facilitate quick repair. All drainage passes through a retention tank that limits flow to the river and a shut off valve is provided. Tanks fitted with a blast release roof to minimise damage in event of explosion The risk is **Very Low**.	3	Surface water run-off is discharged to the Blackwater Estuary. Given the restricted flow from the retention tank, the presence of the shut off valve and the dilution available in the river, the severity of impact, including cost of remediation would be **Moderate.**

5. RISK EVALUATION

The risks associated with the operation of the facility fall into four categories:

1 Risk of surface water and/or soil and groundwater contamination associated with diesel storage and handling.

2 Risk of surface water and/or soil and groundwater contamination associated with waste oil handling.

3 Risk of surface water and/or soil and groundwater contamination associated with a fire.

4 Risk of surface water and/or soil and groundwater contamination associated with a failure of the digester tanks.

Each of the risks have been ranked to assist in the prioritisation of treatment and these are presented in Table 5.1. Only those risks with a risk score greater than 2 have been included.

Table 5.1 Risk Ranking

Risk ID	Process	Potential Risk	Consequence	Likelihood	Risk Score
5	Fire	Air Pollution	1	5	5
6	Fire	Firewater run-off contamination of the Blackwater Estuary	3	2	6
9	AD Digesters/Digestate / Pasteuriser /Liquid Waste Tanks and Centrifuge	Seepage of liquid leaked to surface water system and Blackwater Estuary due to rupture or damage	3	1	3

A colour coded risk matrix (Table 5.2) has been prepared to provide a broad indication of the critical nature of each risk and is a visual tool for regular risk reviews since the success of mitigation can be easily identified.

Table 5.2 Risk Matrix

Likelihood

V. High	5	**5**				
High	4					
Medium	3					
Low	2			**6**		
V. Low	1			**9**		
Consequence		Trivial	Minor	Moderate	Major	Massive
		1	2	3	4	5

Red – High-level risks requiring priority attention.

Amber – Medium-level risks requiring treatment, but not as critical as a High risk.

Green – Lowest-level risks that do not need immediate attention but there is a need for continuing awareness and monitoring on a regular basis.

There are no risks in the red and amber zones that require either priority attention or treatment. The remaining risks are in the green zone indicating a need for continuing awareness and monitoring on a regular basis. A risk treatment programme has been prepared and is presented in Section 6.

6. RISK TREATMENT

The risk management programme for the installation is set out in Table 6.1

Table 6.1 –Risk Management Plan

Risk ID	Potential Risk	Risk Score	Mitigation Measures	Outcome	Action	Person Responsible
6	Firewater run-off contamination of the Blackwater Estuary	6	Shut off valves on both the storm water and drain. Operational area contained by a combination of perimeter kerb and block wall ERP prepared and staff trained in emergency response.	Firewater Retention Assessment to be carried out.	Carry out firewater retention assessment within 6 months and implement any recommendations within 12 months. Staff training on ERP	Facility Manager
9	Seepage of liquid leaked to surface water and Blackwater Estuary due to rupture or damage to digesters and the digestate, pasteuriser and liquid storage tanks and centrifuge.	6	Shut off valve on surface water drain. Operational area contained by a combination of perimeter kerb and block wall ERP to be prepared	No further physical mitigation measures required.		Facility Manager

7. IDENTIFICATION OF PLAUSIBLE WORST CASE SCENARIO

The risk analysis identified two (Risk ID 6 and 9) with a moderate consequence and these considered to be the 'worst case' scenario for the facility. It is considered that a fire in Building 2 (ID 6) is the worst possible case as it could have the 'knock on effect' of damage to the diesel storage tank (ID 1) smoke emissions (ID 5). Given the distance between the building and the digesters the fire will not have any effect on the tank.

7.1 Source-Pathway-Receptor

7.1.1 Sources

The source of firewater run-off is a fire at the sludge drying building, which damages the diesel storage tank.

7.1.2 Pathways

Potential pathways for the fumes is the atmosphere. The pathway for the contaminated firewater is the stormwater lines. The pathway for contaminated firewater and digestate to soil/groundwater is damaged paving and underlying subsoil.

7.1.3 Receptors

Potential receptors that could be affected by the fumes are facility staff and the occupants of the adjoining landfill. Given the distance to the nearest private residence it is possible it would have to be evacuated, depending on the wind direction. The potential receptors for the contaminated run-off are the storm sewer and the Blackwater Estuary.

Surface Water

The activation of shut-off valve on the discharge point from the facility will retain firewater and digestate within the drainage system and the site boundary. The kerbs and block wall around the paved areas provide retention capacity, however the volume has not been established.

Foul Water Sewer

The activation of the shut-off valve on the foul sewer will prevent the discharge to the Irish Water foul sewer and onwards to the Blackwater Estuary.

Soil & Groundwater

Contaminated run-off and digestate could infiltrate to ground via damaged paving. The subsoils above the bedrock are made ground, clay and gravel up to 14 m below ground level. The aquifer is classified as Locally Important; however the vulnerability at the site is considered to be Moderate to Low. There is only one well within the aquifer, which is located approximately 5 km upgradient of the facility.

7.2 Impacts and Remedial Measures

The potential impacts are on human health, surface water, groundwater or soils. The potential remedial measures include spill containment; demolition and removal of damage buildings or tanks, surface water quality monitoring and ecological compensatory measures, excavation and removal of contaminated soils and reinstatement, monitoring and possible installation and monitoring of groundwater quality and/or possibly groundwater remediation.

8. QUANTIFICATION & COSTING

The costs, which are presented in Table 8.1, are based on the following assumptions:

- The fire service will be on site within 20 minutes of the alarm being raised. The fire will be fought over one day by four fire crews, with one crew remaining on site for 12 hours after the fire has been extinguished.

- The surface water shut-off valve will be closed before the emergency services arrive at the site.

- The rates applied for the removal and off-site disposal of wastes and the contaminated firewater run-off are those currently charged by hazardous waste contractors and include transport and treatment costs.

- Following the incident a soils and groundwater assessment will be carried out. It is assumed that groundwater monitoring wells will be required to determine the nature and extent of the impacts. Provision is made for the remediation of impacted soils.

- Provision is made for surface water quality monitoring and an ecological assessment of the Blackwater Estuary and the implementation of compensatory measures.

- It is not possible to quantify the losses to the atmosphere, but an air quality impact assessment will be carried out following the incident to determine the likely extent, if any, of the impacts associated with emissions to air.

- Given the environmental sensitivity of the site, it is considered that a contingency of 30% is appropriate.

Table 8.1 Worst Case Costs

Task	Description	Quantity (No.)	Measurement Unit	Unit Rate (€)	Cost (€)	Source of unit rates
Response to **Risk ID 9-** Fire and knock-on Risk ID 1, and ID 5	Facility Management and Security.	6	Week	6,000	36,000	ERAS ECO
	Fire Services Attendance on Site[1].	1.5	Day	60,000	90,000	OCM
	Spill containment consumables (extinguishers, booms).	1	Incident	5,000	5,000	ERAS ECO
	Testing of contaminated firewater[2]	4	Sample	250	1,000	OCM
	Transport of contaminated firewater	1,055	m^3	12	12,660	OCM
	Off-site treatment of fire water.[3]	1,055	m^3	23	24,265	OCM
	Demolition of Building[4]	21,175	m^3	20	423,500	OCM
	Removal and off-site disposal of fire damaged materials[5]	300	Tonnes	150	45,000	OCM
	Plant and Equipment Hire	3	Day Rate	5,000	15,000	ERAS ECO
	Removal and disposal non-hazardous building debris[6]	800	Tonne	100	80,000	OCM
	Cleaning yards	2	Day Rate	1,000	2,000	ERAS ECO
	Cleaning drains.[7]	Item	Jet Vac	9,750	9,750	OCM
	Drain integrity survey.	Item		3,500	3,500	OCM
	Air quality assessment.	1	Fees	3,000	3,000	OCM
	Surface water quality monitoring in storm sewer and Blackwater Estuary	12	Sample	250	3,000	OCM
	Remediation of the Blackwater Estuary • Sediment monitoring • Modelling extent of impact • Developing remedial programme • Implementing programme Monitoring effectiveness of programme	Item		300,000	300,000	OCM
	Monitoring in foul sewer	12	Sample	250	3,000	OCM
	Remedial works on Irish Water foul sewer/WWTP	Item		50,000	50,000	PC<

[1] The day rate of €60,000 is very significantly higher than that set in the EPA's ELRA guidance on fires at landfills, which in approximately €18,000
[2] Includes for laboratory analysis, consultants fees itemised separately
[3] Includes transport and treatment cost
[4] Building 2
[5] Based on tonnage in Building 2 listed in the DMP and assumes all is fire damaged, but none consumed by the fire
[6] Based on the non-hazardous nature of the waste in the Shed, the debris will be classified as non-hazardous
[7] Includes use of Jet Vac tankers and transport and off-site treatment costs.

	Soil borings.	10	Boring	100	1,000	OCM
	Soil monitoring.	20	Sample	200	4,000	OCM
	Soil excavation, transport and disposal[8].	120	Tonnes	250	30,000	EPA Guidance
	Reinstatement of excavated area, including repaving.	120	Tonnes	20	2,400	OCM
	Groundwater wells.	3	Borehole	2,500	7,500	OCM
	Groundwater samples[9]	36	Sample	250	9,000	OCM
	Consultancy Services[10].	40	Day	500	20,000	OCM
Total (€)					**980,575**	
Contingency (30%[11])					**294,172**	
Total Including Contingency (€)					**1,274,748**	

[8] Site is paved and subject to regular inspection and repair. Only pathway to soil is damaged paving and leaking drains. Quantity based on and estimated impacted area of 800m^2 to a depth of 0.1m
[9] Includes for three years post incident monitoring at quarterly intervals
[10] Includes for Structural Engineer and Environmental Consultant
[11] Bases on environmental sensitivity of the site

9. CONCLUSION

This ELRA was carried out in accordance with Agency's Guidance (March 2014). The cost associated with the 'worst case' scenario, is €1,274,748. These costs will be recouped from the Eras Eco's insurance policy.

ATTACHMENT 2

Unit 15
Melbourne Business Park
Model Farm Road
Cork

T: 021 434 5366
E:info@ocallaghanmoran.com
www.ocallaghanmoran.com

DECOMMISSIONING MANAGEMENT PLAN

ERAS ECO LIMITED

FOXHOLE

YOUGHAL

CO. CORK

Prepared For: -

ERAS ECO Ltd.,
Foxhole,
Youghal,
Co. Cork

Prepared By: -

O' Callaghan Moran & Associates
Unit 15,
Melbourne Business Park,
Model Farm Road,
Cork

September 2017

Project	Decommissioning Management Plan			
Client	ERAS ECO Ltd.			
Report No	Date	Status	Prepared By	Reviewed By
1519301	27/03/2017	Initial Client Comment	Martina Gleeson PhD.	Jim O'Callaghan MSc, CEnv, MCIWM, IEMA
	05/04/2017	Final		
	26/09/2017	Final Rev A		

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1. INTRODUCTION

1.1 Activity Details

ERAS ECO Ltd (ERAS ECO) is Cork's leading sludge management company and has been operating its facility at Foxhole, Youghal since 2007. The facility operates under an Industrial Emissions Licence (W0211-01) issued by the Environmental Protection Agency (Agency) and treats sewage sludge from local authority sewerage treatment plants and non-hazardous sludges from industrial waste water treatment plants operating mainly in the Cork area.

ERAS ECO has applied to the Agency for a review of the Licence to allow the construction of an Anaerobic Digestion (AD) Plant and associated Combined Heat and Power (CHP) plant, and to increase the amount of waste that can be treated.

The Agency requested ERAS ECO to prepare a Decommissioning Management Plan (DMP) as part of the application for a review of the licence. ERAS ECO appointed O'Callaghan Moran & Associates (OCM) to prepare the DMP. The methodology followed the EPA Guidance on Assessing and Costing Environmental Liabilities (2014) and the document addresses both the existing and proposed operations.

1.2 Site Description

The site is located on reclaimed land in an area zoned for industrial development and encompasses approximately 1.6 hectares (ha). It comprises two waste processing buildings (Building 1and Building 2), an administrative office building, wastewater treatment plant and open yards. It is proposed to construct an Anaerobic Digestion Plant.

1.3 Commencement of Operations

Historical reclamation work in this area has resulted in made ground with a proven thickness of up to 3m. Site investigations identified the made ground to be predominately clay with small portion of construction and demolition waste.

The site was initially used by Youghal Town Council to store diesel for vehicles operating on the adjacent Youghal Landfill. It is understood the tanks were located in the vicinity of the current site entrance.

Youghal Waste Disposal & Recycling Ltd acquired a 35-year lease from the landowners Youghal Town Council, before subletting it to AVR Environmental Solutions Ltd. In 2001, 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).

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. ERAS ECO Ltd acquired the plant in 2006. The Waste Licence was granted in November 2006 and the facility was constructed and commissioned in 2007.

1.4 Closure Scenario and Scope

The facility has no defined lifetime and the risk of closure is low. The commercial viability of the facility will be kept under review and, if market conditions dictate the need to close the facility, the Agency will be notified and the DMP will be implemented. Following a planned closure ERAS ECO may, depending on the future plans for the facility, apply to surrender the Licence.

For the purpose of costing this DMP, it has been assumed, in accordance with the Agency's Guidance, that the plant will close unexpectedly and that the DMP will be implemented by third parties contracted by the Agency.

1.5 Restoration and Aftercare Plan

At the time of the preparation of this plan a Restoration and Aftercare Plan was not considered necessary.

1.6 Limitations

The assessment of costs associated with the implementation of the DMP is based on the information available at the time of the report preparation, including the Agency's Guidance, and may be subject to amendment based on future investigations and the annual review required under Condition 10.2 of the Licence.

2. SITE EVALUATION

2.1 Operator Performance

2.1.1 Facility Management

The Facility Manager has over 12 years' experience in Waste Management and holds a Certificate in FAS Waste Management Training Course. The Environmental, Health & Safety Manager has 7 years' experience in EHSQ and holds a BSc in environmental management, a Certificate in Safety & Health and a NEBOSH Safety Diploma. All operatives are provided with the appropriate and necessary training to complete their assigned tasks.

2.1.2 Compliance History

In 2016, ERAS ECO received no notifications of non-compliances regarding waste storage practices, dewatering of sludge, use of waste wood as a fuel, maintenance of the drainage system and stormwater diversion.

2.1.3 Enforcement History

The facility has never been the subject of any enforcement action taken by the regulatory authorities.

2.1.4 Incidents History

There have been no incidents that had the potential to result in significant soil and groundwater contamination.

2.1.5 Complaints History

In 2015 odour complaints were received and an investigation identified these were associated with the emissions from the biofilter. The duct work had become corroded and the emission point was at a relatively low level. The corrective actions included the replacement of the ducting and extending it to and up the southern elevation of Building 2

to a level where the emission point is above the roof height. This was completed in 2015 and resulted in a reduction in the number of complaints.

In 2016 three complaints were received (15th and 16th March and 8th June) and all were investigated. The potential source of the March complaints was opening the doors of building for the acceptance of woodchip. The investigation of the June complaint did not identify any source other than the potential loss of negative air pressure in the building after the doors were opened to take a delivery of sludge.

2.2 Environmental Pathways & Sensitivities

2.2.1 Surface Water

Rainwater run-off from roofs and non-waste storage paved areas is collected in the surface water drainage system that connects to two silt/oil interceptors (Class 1) and a storm water retention tank.

The run-off is reused on-site when possible (wheel wash, the bio-filter, cooling water for the dry product and to backwash the wastewater treatment plant filters) and the surplus water discharges to the Irish Water combined sewer via a non-return valve. The sewer outfalls to the estuary.

2.2.2 Foul Water

Wastewater generated at the installation comprises sanitary wastewater from the offices, condensate from the sludge drying unit and wash water from the vehicle wheel wash. The sanitary wastewater is treated in a proprietary treatment system (Puraflo ©) adjacent to the northern site boundary, before being discharged to the Irish Water combined sewer, that outfalls to the estuary.

The condensate and water from the wheel wash is treated in the on-site process wastewater treatment plant, with the treated effluent discharged to the Irish Water combined sewer that outfalls to the estuary. Landfill leachate will also be treated in the plant following receipt of approval as required by Condition 3.21.3 of the current licence. It is intended to divert the discharge to the Irish Water municipal wastewater treatment plant in Youghal, when this is commissioned.

2.2.3 Geology & Hydrogeology

The site is underlain by up to 3m of made ground, which overlies up to 11.6m of glacial till, which in turn overlies up to 2m of sandy gravel. The made ground is predominately clay, with small portion of construction and demolition. The bedrock underlying the site consists mainly of the Waulsortian Limestones, which consists of massive, unbedded mounds of calcareous deposits in the form of mudstones, wackestones and packstones.

2.2.4 Neighbouring Developments

A local road runs along its northern boundary, while south of the site is mudlands. To the east of the site is the Youghal Landfill and Civic Amenity Centre operated by Cork County Council. The adjoining lot to the west is occupied by the National Car Test (NCT) centre. The nearest private dwelling is 250m from the site, at the junction of the site access road and the R634.

2.2.5 Designated Sites

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). The site itself is located outside the designated zone.

2.2.6 Emissions

There is one (1 No.) emission point to the surface water (SW-1). There is one (1 No.) emission to sewer (SE-1). There are three (3 No.) existing point emissions to air, which are the boiler stack, the biofilters and the odour control unit in Building 1. The proposed development will result in one new emission point, which will be the stack on the CHP plant.

Site operations are a source of noise and the licence specifies noise emission levels for the nearest noise sensitive locations. Operations are also a potential source of dust emissions and the licence specifies dust deposition limits.

2.3 Site Processes & Activities

<u>Sludge Treatment</u>

The treatment processes comprise reducing the moisture content and pasteurisation using either a biomass fuelled dryer, 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 dryer, 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 dryer 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 dryer 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.

Anaerobic Digestion

The plant will comprise six liquid storage tanks, two pasteuriser tanks and a feed hopper and conveyor located in Building 1, and two digester tanks and a digestate storage tank located in the south of the site. The digesters will be enclosed by an impermeable cover and heated to 37^{O}C and will be continuously stirred and fed with sludges. This process will produce a biogas and a digestate.

The biogas will contain approximately 65% methane, which will then be treated and either used as a fuel in the CHP plant or exported to the national gas grid. Where the feedstock includes animal by-products, the digestate will be pasteurised to facilitate its use as a fertiliser. The pasteurisation process will comply with the Animal By-Product Approval issued by the Department of Agriculture, Food and Marine.

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

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

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

Wastewater Treatment Plant

The plant is designed to treat condensate from the sludge dryer, landfill leachate and wash water from the wheel wash. It comprises a balance tank with an air diffuser, a dissolved air floatation tank, carbon and sand filters, lamella settlement unit, hypochlorite treatment and a sludge storage tank.

Treatment of Yeast Slurries and Whey Permeates

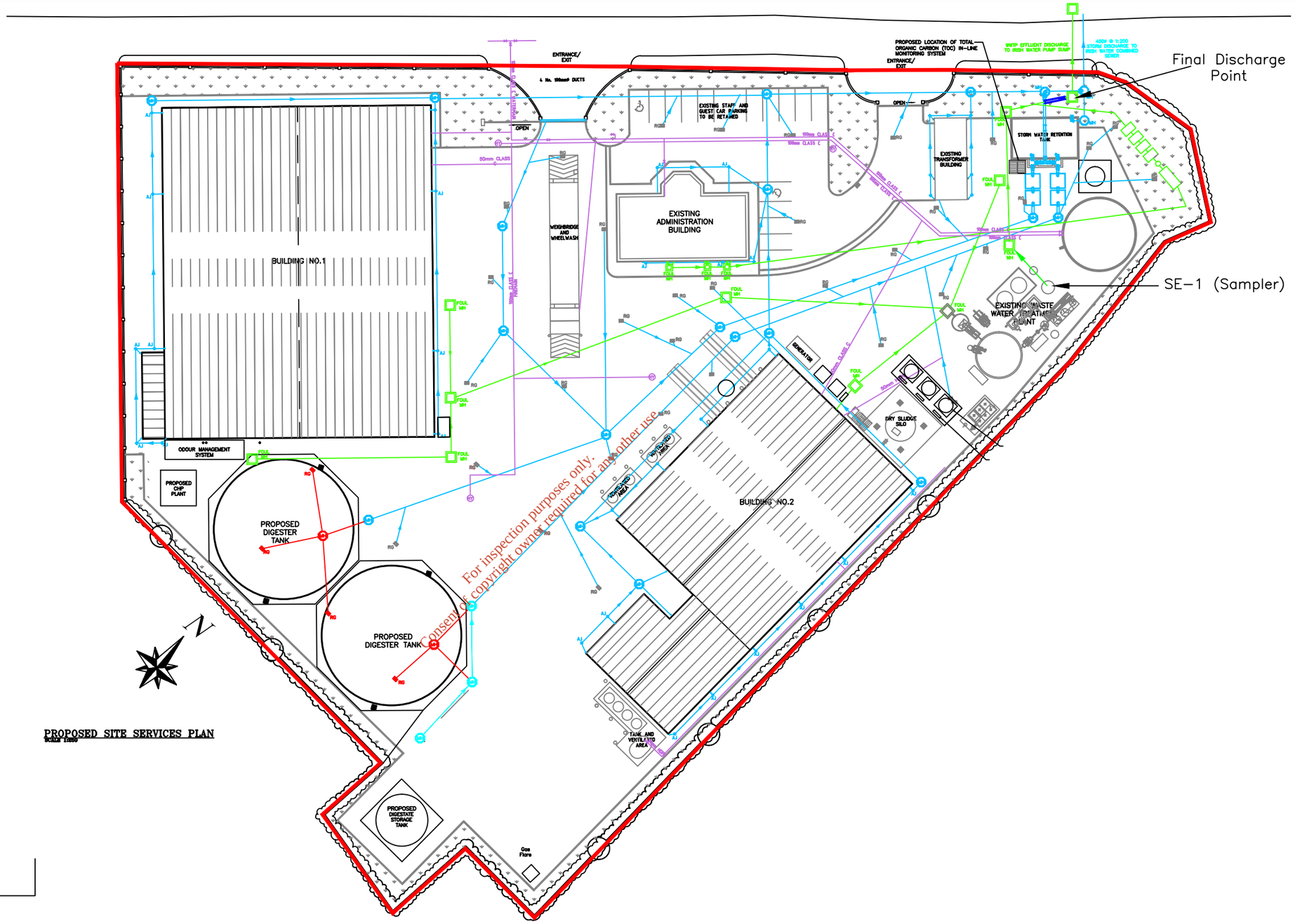
At some time in the future ERAS ECO may accept and treat yeast slurries to manufacture animal nutrition ingredients. Only whey permeates that have been accepted by the Agency as being by-products will be accepted at the installation. Given the quality control requirements the drying will be carried out in a new building, which will require planning permission. The exhaust from the new dryer will be ducted to existing stack and details will be submitted to the Agency by way of an SEW.

2.4 Plant Inventory

The proposed site layout is shown on Drawing No. 15-193-02 Rev C and details of the infrastructure are in Table 2.1.

Table 2.1 – Site Infrastructure

Infrastructure	Details
Administration Building	Two storey (106 m^2) building, houses reception, offices, canteen, toilet & changing rooms, laboratory, public information room
Weighbridges	Precia molen 16M weighbridge located at entrance to access gate.
Building 1	Sludge storage area, biomass/woodchip storage area, workshop
Building 2	Sludge reception area, sludge drying area
WWTP	Balance tank, Culligan filters, carbon, filters, hypochlorite mixing tanks, other tanks: treated water, wash water, sludge.
Anaerobic Digesters	2 No. each 2,208m^3.
Liquid Waste Storage Tanks	6.No. each 100m^3 and located inside Building 1
Digestate Pasteuriser Tanks	2 No. each 25m^3 and located inside Building 1
CHP Plant	2 No. reciprocating internal combustion engines located south-west of Building 1
Gas Flare	1 No. Back up for flare for CHP plant, located south-west of Building 2
Transformer Building	Houses transformer
Water Storage Tanks	Firewater Storage Tank, Stormwater Retention Tank
Oil Storage Tank	Diesel Oil – Capacity 2,600 litres, double skinned tank.



PROPOSED SITE SERVICES PLAN

50 metres

O' Callaghan Moran & Associates.
Unit 15 Melbourne Business Park
Model Farm Road, Cork, Ireland.
Tel. (021) 4345366
email: info@ocallaghanmoran.com
environmental management for business

CLIENT

Eras Eco

TITLE

Site Services

DRAWING No.

15-193-02

REV.

C

Facility operations require the use of a range of mobile and fixed plant, which are listed in Tables 2.2.

Table 2.3 Mobile Plant

	Item
1	CAT IT62H Loading Shovel
1	Toyota Geneo 25 Forklift
1	Porpata Scale DC Milano Vertical Hoist Platform

Table 2.4 Fixed Equipment

Items
Feed hopper and conveyor
Pumps and feed lines
Fire and intruder alarm system
Fire sprinkler system
Odour Control Systems in Building 1 (carbon treatment) and Building 2 (scrubber and biofilters)
Centrifuge
Wastewater treatment plant
Fuel pump and fuel management system
Biomass Boiler
Rotary Dryer

2.5 Inventory of Raw Materials and Wastes

Diesel is stored in a plastic double skinned tank (2,600 litres) adjacent to the southern end of Building 2.

The liquid sulphuric acid, sodium hypochlorite and sodium hydroxide used in the process wastewater WWTP are stored in four Intermediate Bulk Containers (IBC) in a bunded Chemstore adjacent to the WWTP. The unit has a 1,200 litre polythene collection sump 1.

Leachate will be delivered in road tankers and pumped directly into the WWTP balance tank.

The maximum amount materials and wastes on site at any one time are shown in Table 2.5.

Table 2.5 – Materials Inventory

Wastes/Products	Quantity Stored
Untreated Sludge for Drying	250 tonnes
Untreated Liquid Waste	600 tonnes
Contents of Digesters	4,496 tonnes
Digestate	500 tonnes
Landfill Leachate (for WWTP)	25 tonnes
Quarantine Waste	1 tonne
Woodchip (for Boiler)	20 tonnes
Diesel (for Boiler)	2,600 litres
Hydraulic Oil	205 litres
Engine Oil	100 litres
Liquid Alum (for WWTP)	1 tonne
Flopam FO 4107 (for WWTP)	0.8 tonnes
Sulphuric Acid (for WWTP)	1 tonne
Soda Ash (for WWTP)	1 tonne
Sodium Hydroxide Solution (for WWTP)	1 tonne
D-10 (Detergent/Disinfectant)	60 litres

The quantities given in the table are based on the maximum amounts that can be stored on site at any one time, but in the event of the planned closure, the actual quantities should be considerably smaller, as the shutdown would be preceded by a reduction in the on-site inventory.

3. CLOSURE TASKS & PROGRAMMES

3.1 Closure Tasks

3.1.1 Materials Management

A planned shutdown of operations would be carried out after the last batches of waste received at the site had been processed and consigned. It would be preceded by a scaling down of activities, thereby reducing the quantities of materials, particularly fuel and wastes, to be dealt with when implementing the DMP.

Diesel, engine and hydraulic oil will be used to fuel plant and equipment deployed in the decommissioning works. When these are completed, it should be possible to return any remaining diesel and the WWTP chemicals to the suppliers either for resale, or reuse. The remaining materials may have to be disposed of as waste, some of which may be deemed hazardous due to their composition.

A vacuum tanker will empty the oil interceptors and the contents will be sent for disposal at a suitably licensed facility.

3.1.2 Buildings

It is not proposed to demolish any of the buildings, but they will be cleaned out and left in situ for future use. Given the nature of the waste handled at the facility, specialist decontamination of the buildings will not be required, and the cleaning will primarily involve wash down and use of road sweeper to clean the floors.

3.1.3 Plant & Equipment

In the event of a planned closure, the plant and equipment will be either be sent to other biological treatment plants, sold for use, or scrapped at an approved waste recycling/recovery facility.

At the time of the preparation of this DMP, it is not possible to accurately quantify every item of plant that would be suitable for resale, as this depends on their future condition. Those items of mobile plant that cannot be sold will be scrapped. The fixed plant will remain in situ. All the metal items have a scrap value, and therefore the removal of the plant and equipment should be cost neutral.

Given the nature of the wastes handled at the facility, none of the plant items will require specialist decontamination or cleaning before being scrapped.

3.1.4 Interceptors & Drains

As referred to above, the interceptors will be cleaned and the contents sent off site for treatment. All surface water and foul water drainage pipes will be flushed using water.

3.1.5 Services

The telecom, electricity and water supply services will be disconnected.

3.1.6 Environmental Monitoring

Monitoring will continue until all the decommissioning works have been completed.

3.2 Closure Programme

In the event that the entire facility is closed, all the operational areas will be decommissioned. The decommissioning will take 8 weeks (Table 3.1) and will be carried out in a number of tasks, some of which will happen concurrently.

Table 3.1 Decommissioning Plan Schedule

	START	DURATION	Week							
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Tasks										
Task 1 Operate the AD plant										
Task 2 Removal of untreated and treated sludge and empty and clean the liquid waste storage tanks and consumables	1	2								
Task 3 Empty and clean digesters, digestate tank, pasteuriser tank and centrifuge.	3	2								
Task 4 Clean-out Buildings 1 and 2, including AD feed hopper and Sludge Bin. Remove office equipment	3	3								
Task 5 Clean drains and storm water retention tank	5	1								
Task 6 Empty and clean interceptors	5	1								
Task 7 Decommission WWTP, Puraflow and CHP plant and flare										
Task 8 Clean yards	6	1								
Task 9 Disconnecting services	6	1								
Task 10 Closure audit	7	1								

4. CRITERIA FOR SUCCESSFUL CLOSURE

Successful closure will only be complete when:

- All consumables, wastes, end of waste and residual materials have either been treated onsite, or consigned to appropriately authorised recovery/disposal facilities;
- Records of all wastes, materials and plant removed from the site have been prepared;
- All buildings have been cleaned out and services disconnected;
- A site investigation, if required, confirms that soil and groundwater conditions present no significant environmental risk;
- The environmental monitoring confirms no impact associated with the closure and decommissioning works;
- A Closure Audit has been completed and approved by the Agency.

5. CLOSURE PLAN VALIDATION

5.1 Closure Audit & Validation Report

Following the completion of the site clean out, ERAS ECO will appoint an experienced independent environmental auditor, who will be approved by the Agency, to carry out a Closure Audit, and produce a Validation Report that demonstrates the successful implementation of the Plan. The Closure Audit will address:-

1. Disposal of raw materials;

2. Disposal of wastes;

3. Decommissioning of plant and equipment;

4. Disposal of obsolete equipment;

5. Results of monitoring and testing during the decommissioning period;

6 Soil & Groundwater Assessment, and

7 The need for on-going monitoring, remedial actions or aftercare management.

The Validation Report will describe all of the activities carried out during the Closure Audit, and will contain records of the destinations of all wastes and materials consigned from the site during decommissioning. The Report will be submitted to the Agency within three months of execution of the Plan.

6. CLOSURE PLAN COSTING

The costs of a planned closure will be met in full by Ormonde Organics. The costs of implementing the DMP in an unplanned closure scenario where Ormond Organics is not is a position to meet the cost are presented in Table 6.1. The costs are based on the following assumptions:

- The closure will be unforeseen and unexpected with no advance warning that would allow an orderly wind down of activities.
- 250 tonnes of untreated sludge and 600m^3 of liquid waste will be in Building 1.
- All of the digesters, digestate storage tanks and pasteurisers are full (4,966m^3).
- A temporary site manager and operatives will be appointed to manage the plant to ensure that the sludge drying and anaerobic digestion processes are successfully completed and to implement the decommissioning and clean out.
- The cleaning of the digesters, digestate tank, pasteuriser tanks and liquid storage tanks will be carried out by specialist contractors. The washwater will be sent off site for treatment.
- Only the wastes already in the dryer and the AD digesters will continue to be treated. The untreated sludge and liquid waste in Building 1 will be sent off-site for disposal/treatment.
- The diesel storage tank (2,600) litres is full and there are 4 full IBCs of sulphuric acid, sodium hydroxide, aluminium sulphate and hypochlorite on-site. The water treatment chemicals will be used in the WWTP until it is decommissioned.
- The digestate and fibre will be sent to the normal outlets, which based on the nutrient value of the materials and proximity of the land banks will be cost neutral; however an allowance is made for transport costs.
- The entire facility will be decommissioned, all buildings will be cleaned and all wastes products and consumables will be removed from the site.
- The decommissioning of the process WWTP and the CHP and flare will be carried out by third parties.
- It is not proposed to demolish any of the buildings or tanks.

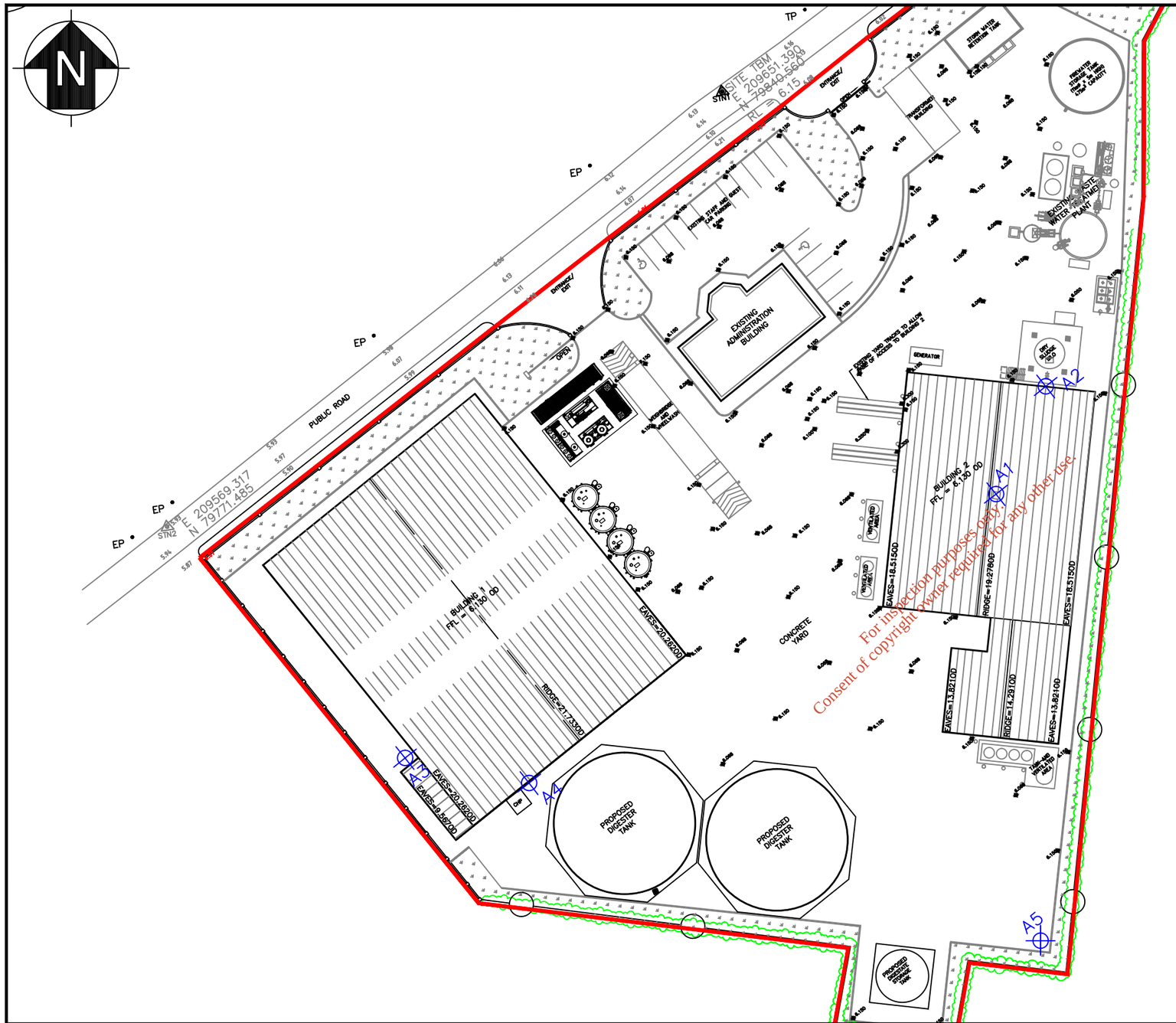
Table 6.1 Costs

Task	Description	Quantity	Unit	Rate	Cost	Source of Unit Rates
Facility Management	Site Manager (2.5 days/week for 7 weeks)	17.5	Day	€ 500	€ 8,750	Eras Eco
	1 No Operative 5 days/week for 7 weeks	35	Day	€300	€10,500	Eras Eco
	Utility Bills				€2,500	Eras Eco
Materials/Waste Disposal/Recovery	Removal, transport off-site and treatment of untreated sludge in Building 1	250	Tonnes	€30	€7,500	Eras Eco
	Removal, transport off-site and treatment of liquid waste in Building 1	600	Tonnes	€ 15	€ 9,000	Eras Eco
	Transport and off-site land spread of digestate[1]	4966	m^3	€ 6.50	€32,279	Eras Eco
	Removal and off-site disposal of leachate	25	m^3	€ 65	€ 1,625.00	Eras Eco
	Removal and off-site disposal of diesel and waste oils	1000	litres	€ 0.70	€700.00	EPA Guidance
Building Plant & Equipment Clean Out	Clean out of Building 1 and 2 (Included in Management Cost)		Day Rate		€ -	
	General cleaning of plant and equipment (Included in Management Cost)		Day Rate		€ -	
	Removal of plant and equipment[2]				€ -	
	Cleaning digesters, digestate tank ,pasteurisers, liquid waste storage tanks, centrifuge (High powered jetting +confined space equipment +trained operatives)	2	Day Rate	€ 1,500	€3,000	Eras Eco
	Removal and off-site treatment of wash water from tanks	40	m^3	€50.00	€ 2,000	Eras Eco
	Cleaning of drains, interceptors and storm water retention tank	1	Day Rate	€700.00	€700.00	Eras Eco
	Decommissioning process WWTP and CHP plant and flare	1	Item	€5,000.00	€5,000.	OCM
Yard Cleaning	Cleaning open yard (Roadsweeper)	1	Daily Hire	€ 400.00	€ 400	Eras Eco
Environmental Monitoring	Air emission and surface water quality monitoring	1	Quarter	€ 5,000.00	€ 5,000	OCM
Validation Audit	Validation Report (Consultant)	1		€ 2,500.00	€ 2,500	OCM
Security Costs	Netwatch	7	Week	€100	€ 700	Eras Eco

[1] Cost is for transport only as digestate has a nutrient value
[2] Cost neutral

Task	Description	Quantity	Unit	Rate	Cost	Source of Unit Rates
Services Disconnection	Disconnect electricity and telecoms	1	Day	€ 400.00	€ 400	Eras Eco
Total Liability €)					€ 92,554	
Contingency (10%)					€ 9,255	
Total					€101,809	

ATTACHMENT 3



LABEL	EASTING	NORTHING
A1	209695	079800
A2	209703	079817
A3	209605	079760
A4	209624	079756
A5	209702	079732

50 metres

O' Callaghan Moran & Associates.
Unit 15 Melbourne Business Park
Model Farm Road, Cork, Ireland.
Tel. (021) 4345366
email: info@ocallaghanmoran.com
environmental management for business

CLIENT

Eras Eco Ltd

TITLE

Emission Points

Drawing No.

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SCALE

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