

# FRICTION ENERGY LTD

## H1 Accidents and Amenity Risk Assessment

### Application for Environmental Permit

**St Margaret's Farm Composting and Biomass Boiler Facility,  
St Margaret's Road, South Darenth, Dartford, DA4 9LB**

Report Ref: CE-SM-1813-RP02-Final, Rev A



**CRESTWOOD ENVIRONMENTAL LTD**

ENVIRONMENT	LANDSCAPE	NOISE	LIGHTING
ECOLOGY	HERITAGE	WATER	TREES
MINERALS / WASTE	AIR QUALITY	LAND QUALITY	VISUALISATION

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**Produced by Crestwood Environmental Ltd.**

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Data and information				Judgement				Action (by permitting)	
Receptor	Source	Harm	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
What is at risk? What do I wish to protect?	What is the agent or process with potential to cause harm?	What are the harmful consequences if things go wrong?	How might the receptor come into contact with the source?	How likely is this contact?	How severe will the consequences be if this occurs?	What is the overall magnitude of the risk?	On what did I base my judgement?	How can I best manage the risk to reduce the magnitude?	What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).
Designated habitat sites, i.e: Darenth Wood SSSI, which is 1Km to the south east of the Site, areas of Priority Habitat (Deciduous Woodland), the nearest pocket of which is circa 300m to the north west of the Site, An area of Open Mosaic Habitat, circa 200m to the north of the Site, an area of	Emissions to air from the combustion of roundwood timber and green waste combusted in the biomass boilers.  Potentially contaminated run-off water from the Site, including from the green waste composting area.	Damage to delicate and important ecological habitats.	Air – i.e. the dispersion of combustion emissions reaches the designated habitat sites. Contaminated surface water run-off reaching designated habitats via overland flow or through percolation and travel through the ground.	Medium	Medium	Medium	Ecological habitats may be sensitive to combustion gases such as NOx and SOx etc or contaminated such water run-off etc.	7m high stack ensures sufficient dispersion and dilution of emissions in the atmosphere to ensure that combustion gases (i.e. NOx, SOx and particulates) from the biomass boilers do not cause adverse impacts on designated nature sites. SLR Consulting prepared an Air Quality Assessment (AQA) and supporting air dispersion modelling (using Aermid) to model emissions from the biomass boilers. The AQA demonstrates that the impact from annual mean NOx emissions on the Darenth Wood SSSI is not considered to cause an adverse effect, with the impact from 24-hour NOx emissions predicted to cause 'no likely damage'; and the impact of nitrogen and acid gas deposition is considered to cause 'no likely damage' on the SSSI.  The biomass boilers each incorporates a high-temperature combustion chamber	Very Low

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Network Enhancement Zone 2, circa 300m to the north and north east of the Site. There are no European Sites (i.e. SPAs, SACs or RAMSAR Sites within 10Km of the Site.	Scavenging birds and animals and pests that may be attracted to the facility may also have detrimental impact on nearby designated habitat sites.							with moving grate and flue gas recirculation. The residual oxygen in the flue gas is fed back to the combustion zone by automatic progressive rotary slide valves serving as the primary and secondary flue gas return. This minimises emissions from the plant. All potentially contaminated surface water run-off from the waste storage and processing areas falls towards a trash screen protected drainage channel and into a silt collection chamber. From the silt collection chamber the water flows into a pump chamber via a high level weir with an incremental flow gate. The pump chamber lifts the water into an engineered water storage lagoon, which incorporates a low permeability high density polyethylene (HDPE) basal and sidewall liner to ensure that run-off is fully contained and the underlying	

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								<p>groundwater is suitably protected. Lagoon and drainage construction has been designed to meet CIRIA C733 Guidance to ensure a high standard of engineering, containment and groundwater protection.</p> <p>Wastes will be restricted to green waste, thereby avoiding potential food sources that attract birds, scavenging animals and pests. A Pest Management Plan has been prepared for the Site and an ongoing contract will be put in place with a specialist Pest Control Contractor.</p> <p>In the unlikely event of infestations or any complaints received at the Site, details will be logged in accordance with the EMS procedures in place and mitigation measures will be implemented, as appropriate, to ensure a high level of control.</p>	

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								There is effectively no pathway for surface water run-off to reach designated habitat sites and emissions to air from the facility will have an insignificant impact on the protected habitats. Waste types do not inherently attract scavenging birds or animals or pests. Therefore, potential damage due to toxic contamination, nutrient enrichment, smothering, disturbance, predation etc is negligible.	

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<p>The Site is accessed off St Margaret's Road, South Darenth, Kent, DA4 9LB.</p> <p>It is located in a predominantly rural area, surrounded by agricultural fields and St Margaret's Road to the north.</p> <p>There are a number of sensitive receptors in</p>	<p>Odour from waste delivery, off-loading, storage and processing.</p> <p>Odour from recovered materials, prior to off-Site dispatch.</p> <p>Odour from oil storage tanks etc.</p>	<p>Detriment or nuisance to local residents and businesses etc</p>	<p>Air</p>	<p><b>Medium</b></p>	<p><b>Medium</b></p>	<p><b>Medium</b></p>	<p>Green waste composting has the potential to give rise to odour.</p>	<p>There is the potential for the green waste composting process to generate odours during waste delivery, off-loading, storage and processing operations such as shredding, turning and screening. Emissions also have the potential to arise from static windrows during composting, finished compost storage and loading, and from leachate storage.</p> <p>Wood chip processing operations will also be undertaken at the Site to generate fuel for use in the biomass boiler plant, which will be located in a dedicated building. Clean wood waste will be chipped and transferred to the building for combustion in the biomass boilers. Due to the nature of the material that will be processed, it is not anticipated that significant odour emissions will occur as a result of the operation.</p>	<p><b>Low</b></p> <p>An Odour Assessment and supporting dispersion modelling has been undertaken for the Site and demonstrates insignificant impact at all sensitive receptors.</p>

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proximity to the Site including independent businesses located to the west of the Site, the closest being circa 10m distance from the permit boundary. St Margaret's Farm Cottage is circa 125m to the west. Other residential properties are located within the St Margaret's Farm complex								Pre-acceptance and acceptance checks will be made and any waste loads that are highly odorous will not be accepted at the Site. In the unlikely event that any highly odorous wastes are inadvertently received they will be placed in a sealed and lidded container and stored as quarantined wastes until they can be removed off-site to the producer or authorised facility. The use of a lidded skip or container will help to minimise any potential odour release during their storage on Site and subsequent transport off-site. The removal of any highly odorous wastes from the Site will be regarded as a priority incident and carried out as soon as practicable and within 24 hours, subject to the producer or authorised facility being able to accept them within this timescale. Any fuels or oils stored on Site, e.g. for use	



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and off of St Margaret's Road, at between 200 to 240m from the Site.								<p>in mobile plant, will be stored in either dedicated tanks or containers. These will be either double skinned tanks or located in an impermeable bunded area, with a capacity of at least 110% of the largest tank's contents. The use of enclosed storage tank will prevent the escape of odours and leaks to the atmosphere.</p> <p>The Site boundary will be inspected on a daily basis for odour.</p> <p>In the unlikely event of any significant odour being detected on Site or any odour complaints, the odour will be monitored and logged in accordance with the Environmental Management System procedures in place and mitigation measures will be implemented, as appropriate, to ensure a high level of control.</p>	

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See above – local residents and businesses	Dust from vehicle movements and waste operations on the Site. Releases of micro-organisms (bioaerosols).	Harm to human health - respiratory irritation and illness.	Air transport then inhalation.	Medium	Medium	Medium	Permitted waste types do not include dusts, powders or loose fibres so only a medium magnitude risk is estimated. There is potential for exposure if anyone is living or working close to the site (apart from the operator	<p>There is a potential for dust emissions to arise from vehicle traffic on the access roads and hardstanding, green waste processing during dry periods, compost handling and turning during maturation, especially during dry periods, compost loading and wood chipping for processing in the biomass boiler plant.</p> <p>Strict dust control measures including the application of water using a hose or bowser will be used to damp down materials if necessary. The Site includes the construction of two water storage lagoons of 1,500m<sup>3</sup> and 4,500m<sup>3</sup> capacity, which will ensure there is an adequate supply of water for dust control if required.</p> <p>Vehicle movements have the potential to emit particulates particularly during prolonged dry periods e.g. summer</p>	Low

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							and employees)	<p>months. Procedures to prevent dust emissions include the following: the Site entrance and access road comprise engineered surfaces, which will be swept to prevent dust accumulation. Site vehicles will be limited to speeds of ≤10 mph. The waste storage, processing and product storage areas comprise engineered impermeable surface.</p> <p>If on-Site conditions become dusty, a hose or bowser will be used on the Site access road and the working areas, where required (see above). Should the adjacent public highway become muddy a road sweeper will be hired as needed (this is considered unlikely as the Site comprises engineered surface).</p> <p>A bioaerosol risk assessment has been prepared for the Site which demonstrates</p>	

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								that the risks from bioaerosols to local residents and businesses is low.  The Site boundary will be inspected on a daily basis for any dust or particulates escaping the Site. In the event of any dust emissions or complaints received about dust or particulate emissions, details will be logged in accordance with the Environmental Management System. Mitigation measures will be implemented, as appropriate, to ensure a high level of control.	
See above – local residents and businesses (designated habitat sites are addressed previously)	Emissions from combustion process in biomass boilers	Impact of human health (respiratory systems)	Air transport then inhalation	Low	High	Medium	Potential impact of combustion emissions on human health.	An Air Quality Assessment (AQA) and supporting dispersion modelling has been undertaken of emissions from the biomass boilers. The AQA considered the impact of NOx, NO <sub>2</sub> and particulate emissions on local residents and businesses, and nitrogen and acid gas deposition on	Low

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								Darenth Wood SSSI (see designated habitats sites above). The AQA and dispersion modelling demonstrated that the combustion process does not result in any exceedances of the nitrogen dioxide (annual mean or 1-hour) standards or particulate matter (annual mean or 24-hour) standards for the protection of human health at any sensitive receptor.  Both biomass boilers incorporate a 7m high stack and this will assist in the adequate dispersion and dilution of associated emissions from the Site.	
Local residents and businesses, livestock and wildlife.	Litter	Nuisance, loss of amenity and harm to animal health	Air transport then deposition	Low	Medium	Medium	Although local residents are often sensitive to litter, the wastes types do not contain potentially	Although the waste types do not give rise to litter, in the event that contraries in waste loads such as paper, card, plastic film or other light materials are inadvertently received, they will be removed where practicable for authorised disposal off site. Any windblown materials	<b>Very low</b>

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							windblown or litter wastes.	will be collected and placed in a covered skip or container for authorised disposal.	
Users of public highway, especially St Margaret's Road. Local residents and businesses.	Mud and dust on local roads	Nuisance, loss of amenity, road traffic accidents.	Vehicles entering and leaving site.	Medium	Medium	Medium	Road safety, local residents often sensitive to mud on roads.	The Site entrance and access road comprise engineered surfaces, which will be swept to prevent any mud and dust accumulation, as required. All Site vehicles will be limited to speeds of ≤10 mph. The waste storage, recovery and product storage areas comprise engineered concrete surface and sealed drainage system to on-Site storage lagoons. This minimises any potential for mud and debris generation on Site surfaces. As part of the daily inspection regime, the Site will be visually inspected for the presence of mud and debris. Should the adjacent public highway become muddy, a road sweeper will be deployed on an as and when required basis.	Low

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								Any complaints received at the Site about mud and debris will be monitored and logged in accordance with the Environmental Management System procedures in place. Mitigation measures will be implemented, as appropriate, to ensure a high level of control.	
Local residents and businesses.	Scavenging animals, scavenging birds and pests.	Harm to human health - from waste carried off site and faeces. Nuisance and loss of amenity.	Air transport and over land	Low	Medium	Low	Permitted wastes unlikely to attract scavenging animals, birds and pests but may become nesting / breeding sites.	Wastes will be restricted to green waste, thereby avoiding potential food sources that attract birds, scavenging animals and pests. A Pest Management Plan has been prepared for the Site and an ongoing contract will be put in place with a specialist Pest Control Contractor. In the unlikely event of infestations or any complaints received at the Site, details will be logged in accordance with the Environmental Management System procedures in place. Mitigation measures will be implemented, as appropriate, to ensure a high level of control.	<b>Very low</b>

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Local residents and businesses.	Engine noise from vehicles entering and exiting the Site, including reversing beepers, and works associated with waste offloading and processing.	Nuisance, loss of amenity, loss of sleep.	Noise through the air and vibration through the ground.	Medium	Medium	Medium	Local residents are often sensitive to noise and vibration	To minimise noise emissions, all vehicles, plant and machinery operated at the Site will be maintained in accordance with the manufacturer's specification. Plant and vehicles will be switched off when not in use and no activity will be carried out beyond the permitted hours of working as specified under the planning consent. Routine maintenance of plant and equipment will be carried out to minimise noise emissions. In the event of any noise complaints from local residents and other businesses, details will be logged in accordance with the Environmental Management System. Mitigation measures will be implemented, as appropriate, to ensure a high level of control.	Low



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Local residents and businesses and local environment	Flooding of site	If waste is washed off site it may contaminate buildings / gardens / natural habitats downstream.	Flood waters	Low	High	Medium	Although the Site is low risk of flooding, nearby businesses could be adversely affected by a flooding incident.	A climate change risk assessment has been carried out for the Site and included in the permit application as Document D8 (Ref: EN124/SMFC/CCRA). The Site is located in an elevated position remote from any potential flooding. The potential for increased surface water runoff has been designed into the drainage management system and two lagoons of 1,500m <sup>3</sup> and 4,500m <sup>3</sup> capacity will be constructed to capture and manage all surface water run-off. As a result of the integrated design, the risk is identified as very low and no additional mitigation is required. Any other fuels or oils stored on Site, e.g. for use in mobile plant, will be stored in either dedicated tanks or containers. These will be either double skinned tanks or located in an impermeable bunded	Very low

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								<p>area, with a capacity of at least 110% of the largest tank's contents.</p> <p>Any complaints received at the Site about surface water run-off will be monitored and logged in accordance with the Environmental Management System in place. Mitigation measures will be implemented, as appropriate, to ensure a high level of control.</p>	

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Local human population and / or livestock after gaining unauthorised access to the waste operation.	All on-site hazards: wastes; machinery and vehicles.	Bodily injury	Direct physical contact	Medium	Medium	Medium	Site security measures at these facilities are normally good to prevent theft. A medium magnitude risk is estimated.	The operational area is surrounded by a mix of an earth bund and security fencing, The Site entrance will be protected by a heavy gate. 24 hour CCTV will be installed and this will be monitored outside of operational hours with a call escalation for managers in the event of break-in or fire. The CCTV will be recorded with copy retained automatically for 5 days.	Low

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Local residents and businesses and local environment	Arson and / or vandalism causing the release of polluting materials to air (smoke or fumes), water or land.	Respiratory irritation, illness and nuisance to local population. Injury to staff, firefighters or arsonists/vandals. Pollution of water or land.	Air transport of smoke. Spillages and contaminated firewater by direct run-off from site and via surface water drains and ditches.	Medium	Medium	Medium	Although permitted waste types are potentially flammable, a medium magnitude risk is estimated.	See above details on site security.	Low

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Receptor	Source	Harm	Pathway	Probability of exposure	Consequence	Magnitude of risk	Justification for magnitude	Risk management	Residual risk
What is at risk? What do I wish to protect?	What is the agent or process with potential to cause harm?	What are the harmful consequences if things go wrong?	How might the receptor come into contact with the source?	How likely is this contact?	How severe will the consequences be if this occurs?	What is the overall magnitude of the risk?	On what did I base my judgement?	How can I best manage the risk to reduce the magnitude?	What is the magnitude of the risk after management? (This residual risk will be controlled by Compliance Assessment).
Local human population and local environment	Accidental fire causing the release of polluting materials to air (smoke or fumes), water or land.	Respiratory irritation, illness and nuisance to local population. Injury to staff or firefighters. Pollution of water or land.	As above.	Medium	Medium	Medium	Risk of accidental combustion of waste is moderate.	A detailed Fire Prevention Plan (FPP) has been prepared for the Site that meets the requirements of the Environmental Agency's Fire Prevention and Mitigation Plan Guidance-Waste Management New Guidance Note 16 version 2 August 2017. The requirements of the FPP will minimise the risk of any fire occurrence and spread at the Site (see FPP). On Site plant and equipment will be maintained on a regular basis to ensure it is working effectively to minimise the risk of fire. Fire extinguishers will be located in the Site Office and Site staff will be trained in the event of a fire using the fire-fighting equipment available. If deemed necessary the fire brigade will be contacted and EA informed.	Low