



# Environmental Risk Assessment Variation to Installation Permit

**Site name:** Piddlehinton AD Facility  
**Site address:** Bourne Park Industrial Estate, Piddlehinton, Dorchester, Dorset, DT2 7YU  
**Operator name:** Eco Sustainable Solutions Limited

Written by Emily Shann Pitts, Shann Pitts Consulting, 26 January 23

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Shann Pitts Consulting Limited

Westbrook Farm, Westbrook, Gillingham, Dorset, SP8 5DT

Mob: 07866 024096

[emily@shannpittsconsulting.co.uk](mailto:emily@shannpittsconsulting.co.uk)

[www.shannpittsconsulting.co.uk](http://www.shannpittsconsulting.co.uk)

## **1.0 Introduction**

### **1.1 Overview**

This document comprising an Environmental Risk Assessment (ERA) has been prepared by Shann Pitts Consulting (SPC) Limited on behalf of Eco Sustainable Solutions Limited, the Operator, to support a substantial variation permit application to vary the existing bespoke waste operation permit to a bespoke installation permit for the anaerobic digestion plant at Piddlehinton AD Facility, Bourne Park Industrial Estate, Piddlehinton, Dorchester, Dorset, DT2 7YU herein termed 'the Site'.

The application has been prepared by SPC in conjunction with and on behalf of the Operator Eco Sustainable Solutions.

### **1.2 Permitting Background**

The current bespoke waste operation permit authorises the treatment of up to 42,000 tonnes per annum of biodegradable food wastes from source separated commercial and industrial sources.

The substantial permit variation which this ERA supports is to:

- Vary the bespoke waste operation permit to a bespoke installation permit to reflect a treatment capacity of the AD plant of over 100 tonnes per day.
- Reflect an increase in tonnages of waste accepted from a maximum 42,000 tonnes per annum (tpa) to 50,000 tpa, due to process efficiencies.
- Remove European Waste Catalogue (EWC) codes 02 03 02, 02 07 05, 03 03 02, 03 03 08, 04 01 05, 04 01 07 and 15 01 02 in line with Appendix B of the Anaerobic Digestion Quality Protocol.
- Add European Waste Catalogue (EWC) codes 02 01 99, 02 02 04, 02 02 99, 02 03 99, 02 04 99, 02 07 99, 03 01 01, 03 01 05, 03 03 11, 07 01 08, 16 10 02, 19 05 99 and 19 12 12 which are in Appendix B of the Anaerobic Digestion Quality Protocol but are not within the current permit.
- Incorporate the new BAT compliant emergency flare
- Incorporate two new back-up generators to be used when there is a power failure (one single phase and one 3-phase).

## 2. Qualitative Environmental Risk Assessment

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?
1.1 Local human population.	Releases of NOx, SOx, NH <sub>3</sub> , H <sub>2</sub> S, CO and Total Volatile Organic Compounds (TVOC), PM10 and PM2.5	Harm to human health - respiratory irritation and illness.	Air transport then inhalation.	Medium	Medium	Medium	<p>There is potential for exposure to anyone living close to the site and to members of the public at locations to which they could be regularly exposed.</p> <p>There are a number of sensitive receptors within 200m:</p> <ul style="list-style-type: none"> <li>Hanson's Pig Unit (workplace) adjacent to southern boundary</li> <li>Mole Valley Farmers (workplace) 10m west</li> <li>Bride Valley Motors (workplace) 86m south west</li> <li>The Granary (residential) 136, north west</li> </ul> <p>The site is not within an Air Quality Management Area for NOx.</p> <p>Digestate is stored within a covered tank.</p>	<p>Activities are managed and operated in accordance with a written management system which will include the inspection and maintenance of equipment, including engine management systems.</p> <p>Emissions to air from the CHPs is monitored annually by a MCERTS contractor in accordance with the permit. All monitoring required by the permit will be reported as per the permit requirements.</p> <p>Leak detection and repair (LDAR) programme in place to mitigate and prevent methane and VOC emissions.</p> <p>Gas pressure is continuously monitored by SCADA system to minimise the release of biogas.</p> <p>All pressure relief systems are inspected and calibrated as per manufacturers recommendations.</p>	Low

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							The 4 No. CHPs have 10m stacks and the boiler (not currently in use) has a stack height of 11m.		
1.2 Local human population.	Release of microorganisms (bio-aerosols).	Harm to human health - respiratory irritation and illness.	Air transport then inhalation.	Low	Low	Low	<p>There is the potential for bioaerosol release:</p> <ul style="list-style-type: none"> <li>When waste is received; and</li> <li>during storage of digestate.</li> </ul> <p>There are a number of sensitive receptors within 200m:</p> <ul style="list-style-type: none"> <li>Hanson's Pig Unit (workplace) adjacent to southern boundary</li> <li>Mole Valley Farmers (workplace) 10m west</li> <li>Bride Valley Motors (workplace) 86m south west</li> <li>The Granary (residential) 136, north west</li> </ul>	<p>Open composting of digestate fibre is not undertaken on site.</p> <p>Bio-filters serving the pasteurisation unit and the Reception Building are maintained and monitored for efficiency.</p> <p>Biofilters are checked daily for integrity and proper operation and are checked 6 monthly intervals for gas break through using calibrated hand-held gas indicators.</p>	Low

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1.3 Local human population	Odour	Nuisance, loss of amenity	Air transport then inhalation	Medium	Medium	Medium	<p>Local residents often sensitive to odour. Odour can result from:</p> <ul style="list-style-type: none"> <li>• receipt of waste</li> <li>• the release of biogas</li> <li>• digestate</li> </ul> <p>All waste reception and pre-treatment are carried out in the Reception Building which benefits from an odour abatement system (biofilter). The digester tanks are covered and gas tight. The digestate storage tank is covered.</p>	<p>A revised odour management plan will be developed and implemented if activities are giving rise to pollution outside the site due to odour.</p> <p>A LDAR programme is in place to mitigate to prevent fugitive emissions of biogas.</p> <p>Bio-filters serving the pasteurisation unit and the Reception Building are maintained and monitored for efficiency.</p> <p>In order to reduce emissions to air and to improve the overall environmental performance process monitoring will be undertaken and digestate samples will be analysed periodically to verify that process controls have been effective in producing stable digestates.</p>	Low
1.4 Local human	Noise and vibration.	Nuisance, loss of	Noise through the air	Medium	Medium	Medium	Local residents can be sensitive to noise and vibration. However,	Operational measures to reduce noise emissions include:	Low

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population.		amenity, loss of sleep.	and vibration through the ground.				<p>there is low potential for exposure.</p> <p>Whilst there are sensitive receptors within Bourne Park within proximity to the site, these are workplaces and also sources of noise. The closest residential receptor to the site is The Granary approximately 136m to the north west of the site. Two of the four CHPs are partially screened from this receptor via the Reception Building.</p>	<ul style="list-style-type: none"> <li>Planned preventative maintenance of plant and equipment including the flare and the CHPs.</li> <li>Only trained staff are able to operate equipment.</li> <li>The planning permission restricts delivery of waste to the site between the following hours: <ul style="list-style-type: none"> <li>07.00 to 17.00 Monday to Friday</li> <li>07.00 to 13.00 Saturday</li> <li>No HGV movements shall take place on Sundays or Bank Holidays.</li> </ul> </li> </ul>	

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								<ul style="list-style-type: none"> <li>There is a 5mph speed limit on site.</li> </ul> <p>The maintenance of all critical plant and equipment (including fans and extraction equipment) is captured on the site's Maintenance Schedules, to ensure it is suitably maintained and reduce the likelihood of noise from improper upkeep.</p> <p>A noise and vibration management plan will be produced in the event that noise complaints are attributed to the operation of the AD Plant.</p>	
2.1 Local human population, livestock and wildlife after gaining unauthorised access	Gaining unauthorised access to the installation.	There is a risk of direct physical contact with all on-site hazards such as wastes, machinery	Direct physical contact.	Low	Low	Low	Direct physical contact is minimised by activity being carried out within an enclosed system of tanks, so a low magnitude risk is estimated.	Activities are managed and operated in accordance with a management system which includes site security measures to prevent unauthorised access. Specifically, there is CCTV monitoring and recording for the Reception Building including entrance, car park, the weighbridge and the secondary containment area. The CCTV can	Low

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to the installation.		and vehicles. There is a risk of causing injury to humans or livestock.						be logged into remotely by site personnel. Only authorised persons are allowed on site and around the AD plant.  Maintenance workers or contractors are not permitted on site without a suitable qualification and they must have permission to do the work.	
3.1 Local human population 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, fire fighters 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 biogas is flammable, risk of direct physical contact is reduced by activity being carried out within enclosed systems.  The consequences of an incident may be serious, affecting both human health and the environment, through loss of containment.	As above.  There is a site-specific Emergency Response Plan ( <b>ECO-EP-03</b> ) which forms part of management system (includes fire, biogas release and spillages).  A DSEAR assessment has identified all areas of risk. Fire control measures and procedures are set out in the DSEAR plan and have been communicated to the local fire service.  Warning signs are clearly displayed and operatives are fully trained in gas alarm procedures	Low



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								There is a schedule of planned maintenance in place.  All visitors shall be accompanied by trained staff.  LDAR programme is in place to mitigate and to prevent fugitive emissions of biogas.	
3.2 Local human population and local environment.	Accidental explosion of biogas risks causing fire and smoke to travel through the air.	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or arsonists/vandals. Pollution of water or land.	Air transport. Spillages and digestate direct run-off from site and via surface water drains and ditches.	Low	Medium	Medium	The risk of occurrence is reduced by effective management systems.  However, biogas is flammable, and the consequences are likely to be serious, including risk to: <ul style="list-style-type: none"> <li>safety and wellbeing of those working or in close proximity to the site</li> <li>loss of containment may be detrimental to the environment</li> </ul> The site benefits from a secondary containment system.	Risks are managed as per 2.1 and 3.1.  There is a site-specific Emergency Response Plan ( <b>ECO-EP-03</b> ) which forms part of management system (includes fire, biogas release and spillages). There is staff training in place on emergency procedures.  The management system includes planned maintenance schedules including checks on the secondary containment system.	Low

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3.3 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 fire fighters. Pollution of water or land.	As above.	Low	Medium	Medium	The risk is reduced by an effective management system.	<p>This risk is managed in the same way as risks 2.1, 3.1 and 3.2.</p> <p>The following control measures are in place to mitigate an explosion caused by a lightning strike on the roof of the digesters and the pre-storage tanks (which will both be referred to as the 'tanks'):</p> <ul style="list-style-type: none"> <li>The roofs of the tanks are domed and do not have a point in the middle which could act as a conductor.</li> <li>There is a gap between the outer membrane and the gas-tight liner, which will spread a strike sufficiently that the energy is dissipated before it gets through to the methane.</li> <li>The site has been modelled for lightning strikes by Omega Red Group Ltd. A lightning strike is more likely to occur down the sides of the tanks. Therefore, the</li> </ul>	Low

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								<p>tanks are earthed directly to ground with their own earthing rods;</p> <ul style="list-style-type: none"> <li>The pre-storage tanks have a steel pole through the middle, which will conduct the electricity to ground.</li> </ul> <p>A Fire Risk Assessment carried out in March 2022 recommended that lightning conductors are installed on the Reception Building.</p> <p>Activated charcoal and other combustible materials are stored safely and in accordance with any manufacturers' recommendations.</p>	
4. Risk of land bank contamination	Plastic in digestate and chemicals of concern contaminating the land bank	Risk of long-term impact on soil and crop quality.	Direct application to soils through landsprea ding, uptake of contamin	Medium	Medium	Medium	<p>The reasons for giving the activity this rating is because there is a risk of:</p> <ul style="list-style-type: none"> <li>long term impact on soil quality</li> </ul>	<p>Waste acceptance procedures are in place -Piddlehinton Feedstock Acceptance and Rejection Procedure (<b>ECO-OP-25</b>).</p> <p>Waste is shredded (12mm) to remove plastics and other contraries prior to digestion. The</p>	Low

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	Operators landspreading contaminated digestate.		ants from crops.				<ul style="list-style-type: none"> <li>loss of an end market for digestate</li> </ul>	<p>digestate is screened to 6mm prior to pasteurisation.</p> <p>Digestate is routinely tested to ensure it is suitable for application to land and it is applied at an appropriate rate.</p> <p>The digestate complies with PAS110 requirements in accordance with the Biofertiliser Certification Scheme.</p> <p>Quarterly waste returns will include the details of any recovered outputs.</p>	
5.1 All surface waters close to and downstream of site.	Spillage of liquids, including oil and digestate.	Acute effects: fish kill.  Water supply pollution	Direct run-off from site across ground surface, via surface water drains, ditches etc.	Low	Medium	Low	<p>There is the potential for spillage from digestion tanks and digestate and other polluting substances such as oil from storage vessels on site.</p> <p>The site is remote from any watercourses, the River Piddle is more than 900m away to the west of the site.</p>	<p>Primary infrastructure bunding of the buffer tanks, digesters and digestate storage tank is in line with CIRIA 736 and industry standards.</p> <p>Polluting substances are all contained.</p> <p>Oil storage tanks are provided with the CHP Engines and are bunded within the container.</p>	Low

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								<p>Wastes is stored on impermeable surfaces with sealed drainage back to the process.</p> <p>Run-off is restricted to clean surface water.</p> <p>There is a sealed drainage system in place with designated clean and 'dirty areas'. Run-off from areas designated as 'dirty' as well as condensate are recirculated back through the AD process. Condensate traps are checked daily.</p> <p>Operational staff are trained and conversant with the site-specific Emergency Response Plan (<b>ECO-EP-03</b>).</p>	
5.2 All surface waters close to and downstream of site.	As above	Chronic effects: deterioration of water quality.	As above. Indirect run-off via the soil layer.	Low	Medium	Low	As above	<p>As above.</p> <p>All tanks benefit from high level sensors and alarms and are connected to SCADA.</p> <p>There is a daily check in place on all tanks, pipes and ducts in accordance with Daily Checks. All</p>	Low

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								tanks will be inspected by a competent qualified engineer every 5 years as part of a scheduled degrid.  The secondary containment system for the AD plant is in accordance with CIRIA C736.	
6. Abstraction from watercourse downstream of facility (for agricultural or potable use).	As above	Acute effects, closure of abstraction intakes.	Direct run-off from site across ground surface, via surface water drains, ditches etc. then abstraction.	Medium	Medium	Medium	As above	This risk is managed in the same way as risks 5.1 and 5.2 above.  The site is not located within a Groundwater Source Protection Zone, or within 50 metres of any well, spring or borehole used for the supply of water for human consumption.  Impermeable surfacing is in place to prevent potential pathways for any pollution; spills for example, to groundwater.  Visual integrity checks of all primary containment will be undertaken daily in line with the site's Daily Checks (PWEL-FT-01) and primary containment is	Medium

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								subject to integrity testing every 5 years.	
7. Groundwater	As above	Chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole.	Transport through soil/groundwater then extraction at borehole.	Medium	High	Medium	There is the potential for spillage from digestion tanks and digestate and other polluting substances such as oil from storage vessels on site.  The site is located in a groundwater source protection zone 1.	Risk management is as set out in 5.1, 5.2 and 6.1.	Low
8. Risk of diffuse emissions from polluting and greenhouse gases such as methane and ammonia	Fugitive releases of volatile organic compounds such as methane from storage of gas bags, lagoons, tanks, vents and pipe work.	Acute effects and long-term effects on air quality, longer term effects of volatile organic compound releases and adding to global	Airborne fugitive emissions from site	Medium	Medium	Medium	Biogas contains high levels of methane and carbon dioxide.  Digestate and digestate storage may release ammonia which can impact air quality.  Burning biogas can produce harmful pollutants.	There are a series of controls in place to mitigate the risk of diffuse emissions from the site which include:  Venting to air from digester tank is minimised by the correct fitting and configuration of PRVs including daily checks. Process monitoring of the AD plant minimises excess biogas production and the likelihood of an overpressure event.	Low

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		climate change						<p>An emergency biogas flare is installed with a set point lower than that of the PRVs preventing emissions of unburnt biogas. The operation of the PRVs is recorded as an abnormal event.</p> <p>Gas pressures are continually measured and monitored within SCADA.</p> <p>LDAR programme will be actioned to mitigate and prevent fugitive emissions.</p> <p>Gas holders are maintained as per manufacturer's recommendations and are included on the sites Maintenance Schedule.</p> <p>Emissions to air from the CHP stacks are monitored annually by a MCERTS contractor in accordance with the permit. All monitoring required by the permit is reported as per the permit requirements.</p> <p>Biofilters are checked daily for integrity and proper operation</p>	



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								and are checked 6 monthly intervals for gas break through using calibrated hand held gas indicators.	
9. Protected Sites, including National Parks and Areas of Outstanding Natural Beauty, Marine Conservation Zones, Sites of Special Scientific Interest, Special Areas of Conservation,	Any, but principally NOx and NH <sub>3</sub> .	Harm to protected site toxic contamination  nutrient enrichment  leachate  contaminated surface water run-off  smothering  disturbance  predation from pests and vermin	Any	Low	Low	<b>Low</b>	Anaerobic digestion operations may cause harm to and deterioration of nature conservation sites.  The site is located; <ul style="list-style-type: none"> <li>&gt;500m from any European site (defined within Regulation 8 of the Conservation of Habitats and Species Regulations 2017) or a Site of Special Scientific Interest. The nearest statutory designated environmentally sensitive receptor to the site is Lyscombe and Highdon Site Special Scientific Interest 3.3km to the north west;</li> </ul>	Emission limits for stack gases are specified within the permit.  The digester and the digestate lagoon are covered.  There will be no composting of digestate fibre on site.	<b>Low</b>

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Special Protection Areas & Ramsar wetland sites							<ul style="list-style-type: none"> <li>• 250 metres of the presence of great crested newts, and</li> <li>• &gt;50 metres of a Local Nature Reserve, Local Wildlife Site, Ancient Woodland, Scheduled Monument or a site that has species or habitats of principle importance.</li> </ul>		

Magnitude of Risk	Consequence		
	Low	Medium	High
Probability of Exposure			
Low	Very Low	Low	Medium
Medium	Low	Medium	Medium
High	Medium	Medium	High