ENVIRONMENTAL RISK ASSESSMENT (WESTWOOD)

1. Procedure Objectives

1.1. This Environmental Risk Assessment highlights the controls in place to minimise the risk of an environmental incident occurring on site which has the potential to cause pollution of the environment, harm to human health and/or detriment to local amenities. This document provides an assessment of both existing and proposed operations with the potential to cause harm and the overall risk of this occurring with the site-specific control measures and procedural controls in place.

2. Scope

2.1. This Environmental Risk Assessment has been produced in support of an environmental permit variation application to incorporate gas exportation to the national grid alongside the existing gas to engines for electricity generation pending export.

In summary, this proposal includes:

- Increase the permitted waste annual throughput from 65,000 to 110,000 tonnes.
- There will be no increase or changes to the current permitted area or expansion to the geographical footprint of the site.
- The current 1140m^3 Raw Waste Buffer Tank (RWBT) will be replaced with a new tank of the same capacity;
- Total initial design Digester storage capacity of 12,620m^3 will remain unchanged, comprised of 4,560m^3 (2 x 2280m^3 digesters) to continue to serve the CHP engines and 8,060m^3 (2 x 2280m^3 and 1 x 3500m^3 digesters) for gas generation to the national grid.
- Digesters 1, 3, and 4 will be rebuilt to the current dimensions. The current Digester 2 will remain in use for CHP generation.
- Digester 5 was never built as part of the original installation except for the concrete base, although the design storage capacity of the tank was included in the original secondary containment maximum design capacity. Digester 5 will be constructed but with a larger tank diameter than the original planned digester but at the same height as the other 4 digesters at 14 metres. A new digester 5 will have a diameter of 17 metres instead of 14 metres.
- Pasteuriser tanks 1 & 2 will be rebuilt to the same diameter but with an increased height from 7 to 8 metres high which is significantly less than the height of the digesters and the RWBT, which will increase the storage capacity of each tank from 140m^3 to 160m^3. These will be equipped with a digestate chiller system.
- The current redundant 140m^3 Fats, Oils and Greases (FOG) tank will remain and will be recommissioned as a Dirty Water Tank to store captured rainwater from within the bund for treatment pending discharge to the onsite pond.
- An additional gas holder will be installed to serve the Gas to Grid operations. The existing gas holder serving the CHP engines will remain.

- An additional gas flare will be installed to serve the Gas to Grid operations. The existing gas flare serving the CHP engines will remain but will be relocated adjacent to the new Gas to Grid flare.
- Gas boilers will be installed to provide heat for Digesters 3, 4 and 5. There will be a duty and a standby boiler installed within the pump room which will share the same emission stack.
- Installation of Gas to Grid infrastructure including, but not limited to, a Biogas Upgrade Plant (BUP), Gas Entry Unit (GEU) and propane storage.
- The current 3 x CHP engines (1 x 0.8 MW, 2 x 1.63MW) will remain in operation. The existing emissions stack will remain unchanged.
- A new replacement carbon filtration system will be installed to treat extracted channelled air from the waste reception and process building pending emission to air via a stack to aid dispersion. This will include new replacement ventilation and extraction ducting with point source extraction vents/hoods positioned close to all predominant sources of odour within the building.
- The existing below ground pit in the waste reception building is no longer used for its original intended purpose to store treated feedstock and for digester return. As such, the odour concentration within the sump is significantly less and therefore the existing cockle biofilter treating the extracted channelled air from the sump has been isolated and decommissioned (as agreed with the Environment Agency) and can be removed from the permit as a specified abatement system.
- A new sealed separator room will be purpose built to house the Borger screw press separator for digestate screening together with a contaminates skip. Extracted air from the separator building will be channelled through to a new acid scrubber for treatment prior to emission to air via a stack to aid dispersion. This is a new abatement system and emission point to be listed in the permit.
- Digestate Storage Tank 1 will be subject to a full de-grit, cleaned out and then recommissioned with improvements pending use for PAS110 digestate storage. The headspace of this tank will be extracted through to the same purpose designed acid scrubber serving the screening room. Currently the headspace of Storage Tank 1 is extracted through to a containerised woodchip biofilter. This biofilter is now redundant and will be replaced by the acid scrubber to provide effective odour abatement.
- Improvements to the existing clay lined secondary containment bund where required.

3. Responsibility

3.1. The Compliance Director/Head of Compliance is responsible for reviewing the Environmental Risk Assessment following the installation of any new documented procedures, installation of new infrastructure, plant and/or equipment which may influence this plan.

4. Associated Documents

4.1. All associated documents referred to in this risk assessment are underlined.

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Spillage from delivery vehicle / spillage from vehicle during discharge / mechanical failure.	Land Surface waters Groundwater Atmosphere Human receptors	Direct runoff from site, infiltration through soil.	Source segregated food waste will continue to be delivered to the plant in sealed or covered vehicles. All vehicles carrying wastes enter the site, pass over the weighbridge and once cleared by weighbridge control, are allowed to reverse (under supervision) into the waste reception hall. Vehicles are not allowed to tip within reception until the shutter doors are completely closed behind them. All deliveries must be supervised by a site foreman. The roller shutter doors are subject to daily checks and an annual service conducted by an independent third party. The reception building floor is impermeable (concrete) served by sealed drainage. The building floor is engineered to a suitable gradient to drain away from the shutter doors (point of vehicular access) to a sealed drainage system which is contained and put through the treatment process. Any liquor or leachate	Very unlikely. Whilst it is feasible that delivery vehicles could leak, the site has been engineered to include sealed drainage for the discharge of materials. In addition, management systems and documented procedures include spillage response plans, such as the Emergency	Soil contamination Surface water pollution Groundwater pollution Odour – complaints from receptors	Low

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			including from a spillage within the building enters the sealed drainage system and is contained. Once fully discharged, the shutter doors are reopened, and the vehicle is allowed to depart in accordance with the speed restrictions. The waste reception building at Westwood will remain unchanged and will not be subject to any significant structural alterations. The building will remain enclosed and will be served by a new purpose designed and engineered negative air extraction system providing at least three air changes per hour preventing odorous air from escaping from the building. All predominant sources of odour within the reception building, including the storage bays and both hammermills for example will be served by point source extraction hoods or vents in accordance with BAT. Odorous air from the building will be extracted and channelled through to	<u>Preparedness and Response Procedure</u> Duty of care for transportation of waste. The proposed increase in annual throughput from 65,000 to 110,000 tonnes will not increase the risk as a result of spillages from vehicles within the site.		

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			a new purpose designed and engineered carbon filtration system for treatment prior to being emitted to atmosphere via a stack to aid dispersion. Once deposited within the designated waste reception bays, the load is visually inspected again prior to being picked up with a materials handler and loaded into a hopper to feed a hammermill. Contamination tends to be objects which could cause mechanical damage to front end processing equipment as opposed to hazardous waste materials. However, to ensure this does not pose a risk, training is also provided to employees on hazardous waste, and this is also covered under the Disposal of Hazardous Waste Procedure. A designated quarantine area for non-conforming wastes is available within reception at all times (**document reference WWSLP1**).			

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			The anaerobic digestion process operates on a continuous flow process and with Biogen's strict pre-acceptance waste procedures in place, the maximum storage capacity for feedstock within the reception building will not be exceeded. In the unlikely event further, feedstocks cannot be accepted on site, Biogen would divert feedstocks elsewhere to other anaerobic digestion sites within the company, with the closest sites being Twinwoods (7 miles) in Bedfordshire, or Bygrave (38 miles) and Hoddesdon (54 miles) in Hertfordshire. The area of concrete immediately adjacent to the reception hall door is contoured to fall to two drains which also enter the sealed system; therefore any leak prior to discharge would be directed to and contained within the sealed system.			

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			In the event a mechanical fault resulting in an oil leak, all site operatives are conversant with the Emergency Preparedness and Response Procedure and immediate action would be taken to ensure spill kits are used to absorb any spillage. Used spill kits will be stored and disposed of in accordance with the Disposal of Hazardous Waste procedure. Multiple spill kits are distributed around the site include within and outside the waste reception building. In the unlikely event any fuels entered the sealed drainage system. All fuel / material would be removed by tanker and sent for appropriate recovery or disposal elsewhere in accordance with duty of care and hazardous waste obligations by a registered waste carrier. Any contaminated feedstocks would be removed for appropriate disposal elsewhere. The sealed drainage system			

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			would be flushed through and cleaned prior to a thorough inspection before being put back into use. Odour from any spillage which may occur inside the building should not be detectable outside. The building is served by a negative air extraction system achieving at least three air changes per hour. All extracted air is to be channelled through to a new replacement purpose designed carbon filtration system for treatment prior to emission to air via a stack. Any spillage outside the building within the perimeter bund would be immediately removed and remediated. The CIRIA risk assessment results in a 'low' risk classification for the Westwood site, which therefore requires Class 1 design to C736 guidance. Unlined earth bunds are an allowable design for class 1 sites, with C736 specifying a minimum thickness of 1m of Clay with an impermeability			

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			lower than 1x 10^{-09} m/s. The bund at Westwood exceeds these minimum criteria, with a greater thickness of material with significantly lower permeability. It is noted that there is a localised low spot to the northwest corner of the earth bund. This is to be remediated by clearing the area of topsoil / vegetation, exposing the underlying Clay bund and compacting suitable impermeable Clay under Engineering supervision. This will be brought up to match the level of the adjacent concrete bund wall (98.410mAOD). once completed, the available containment volume for the bund is modelled as 14,008m^3 which exceeds the required volume of 10,875m^3 (document references WWCCA1, WWCM1 & WWBGIR1).			

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			In the event of any significant spillage particularly outside the building, the Environment Agency would be informed immediately The waste reception bays within the building will continue to be used to store incoming feedstocks pending pre-treatment. This system helps demonstrate the 'first in, first out' principle, ensuring the oldest feedstocks are processed first where possible. This helps prevent odour and deterioration in feedstock nutritional value. The large waste reception hall bays ensure adequate storage capacity is available at all times. Due to the continuous nature of the anaerobic digestion process, feedstocks cannot remain in the reception hall for long periods, as continuous feeding of the digesters is essential for digester health and biogas production. Consequently, uninterrupted pre-treatment of feedstocks must take place. If			

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			necessary, liquid waste is added to form the required constituency before it is discharged and stored in the RWBT. The waste reception hall bay will continue to be periodically cleared of all feedstocks which can be demonstrated through CCTV footage. The maximum storage time for feedstock within the reception building prior to processing will remain at 48 hours. This is a worst-case scenario and would only approach this length of time in the event of significant plant malfunction. The maximum storage capacity in the reception building is approximately 400 tonnes at any one time. An increase in the maximum annual throughout to 100,000 tonnes is equivalent to approximately 301 tonnes of feedstock to be accepted each day between Monday to Sunday			

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			which equates to only an additional 123 tonnes per day. This is comparable to approximately 5 additional articulated vehicle loads per day. As part of the gas to grid expansion proposals, the Westwood facility will be operational 24 hours a day 7 days a week due to the nature of the AD process. However, waste processing will take place between 06:30-18:00hrs Monday to Sunday giving a total of 80.5 hours maximum process time per week. Currently waste processing takes place between 07:00-19:00hrs Monday to Friday and between 07:00-13:00hrs on Saturdays giving a total of 66 hours maximum processing time. The reception hall is designed to provide more than adequate storage capacity under an increased annual throughput of 110,000 tonnes per annum. Should no pre-treatment or processing of feedstocks take place, in accordance with the proposed increase in feedstocks to a maximum of 301 tonnes per day, it			

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			would take more than 1.5 days to exceed the maximum storage capacity available within the reception building.			
Spillage from process and storage tanks	Land Surface waters Groundwater Atmosphere Human receptors	Direct surface runoff, infiltration through soil, land drains.	Following pre-treatment, material will be discharged into the process tanks via enclosed pipework. All storage and process tanks will be rebuilt to have a minimum 30-year design lifespan in accordance with BS ISO 15686 Part 1 and incorporate the relevant international standards. The tanks will be constructed of glass fused steel and comply with BS5502 parts 50 and 22. The tanks and pipework will be pressure tested to ensure integrity. Tanks and pipework will be fitted with pressure alarms, flow meters and Pressure Relief Valves (PRVs). All-purpose built tanks will be designed and constructed to prevent leakage or overfilling.	Very unlikely. The management systems together with advanced tank level detection measures in place would prevent this incident from occurring. However, in the unlikely event of catastrophic tank failure the secondary containment area is designed and	Land contamination Surface water pollution Environmental sensitive receptors including Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack	Low

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			All storage tanks are fitted with two sets of high level detection probes continuously monitored and connected to SCADA. In addition to this they are hard-wired to automated valves and feed pumps. Pressure transducers automatically shut down all feeding into the tanks when activated. The high level tank detection probes are subject to monthly testing. In addition, all tank levels will be visually checked daily (where possible) and the findings recorded on a daily checklist. Multiple flood probes are to be positioned throughout the site including within the storage and process tank area. Flood probes will be monitored on SCADA and will be subject to monthly recorded checks. Flood probes will be hardwired to stop all feed pumps once activated.	constructed to contain 25% of the total tank volume. The geology of the area does not provide a readily available pathway to groundwater even in the event that the bund was breached. The **Emergency Preparedness and Response Procedure** would ensure actions to	Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site. Groundwater pollution	

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			All tanks are maintained in accordance with the manufacturers recommendations and subject to daily visual checks. Recorded integrity checks are undertaken for all tanks following a degrit by a qualified third party. C736 guidance recommends that the secondary containment volume is the larger of 25% of the bund capacity or 110% of the largest tank. 25% of the proposed total primary containment capacity is 43,500m^3 = 10,875m^3, 110% of the largest tank (digestate storage tank) is 9,700m^3 = 10,670m^3. At Westwood 25% of the total inventory dominates and the required secondary containment capacity is 10,875m^3. The total secondary containment capacity provided by the existing bund of 14,008m^3 exceeds the	prevent contamination. Any spillage on site would be remediated as quickly as possible. This would minimise any likely odour being detected offsite. In the event of a protracted incident and remediation, nearby receptors would be notified. Any contained spillage would be either returned back into the system or	Odour - Human receptors Potable water supplies	

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			required figure of 10,875m^3, and therefore the secondary containment bund has adequate volume. Boreholes drilled identified that the containment bunds are formed from Clay identified predominantly as the Oadby member – Diamicton. Samples were extracted from this material for laboratory permeability testing, which gave results for Coefficients of Permeability of 5.3 x 10^{-11} m/s and 1.2 x 10^{-10} m/s. These permeability values are significantly lower than the required threshold of 1 x 10^{-9} m/s contained within C736 and other similar guidance. Previous site investigation works completed during site construction in 2009 (Rolton Group, 12th February 2009) also proved that the in situ soils were an 'impermeable' clay with measured permeability lower than C736 requirements.	transported to another Biogen AD facility for processing. Failing this, it would be removed pending recovery or disposal elsewhere to an appropriate waste management facility.		

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			SLR have completed a C736 risk assessment for the Westwood site using the Anaerobic Digestion and Bioresources Association (ADBA) methodology. The risk assessment indicates that the site is considered to be 'low' risk, and therefore requires class 1 design (document reference **WWADBARA1**). Unlined earth bunds are an allowable design for class 1 sites, with C736 specifying a minimum thickness of 1m of Clay with an impermeability lower than 1x 10^{-09} m/s. The bund at Westwood exceeds these minimum criteria, with a greater thickness of material with significantly lower permeability. It is noted that there is a localised low spot to the northwest corner of the earth bund. This is to be remediated by clearing the area of topsoil and vegetation, exposing the underlying Clay bund and compacting suitable impermeable Clay under			

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			Engineering supervision. This will be brought up to match the level of the adjacent concrete bund wall (98.410mAOD). Assuming the low spot is remediated, the available containment volume for the bund is modelled as 14,008m^3 which exceeds the required volume of 10,875m^3. In the unlikely event of a spillage from the tanks the Emergency Preparedness and Response Procedure would be actioned with immediate effect. All site staff receive training in emergency preparedness and response. Spill kits are available throughout the site and are periodically checked and stocked. In the unlikely event of significant spillage, incoming feedstocks would be diverted to Biogen's other AD sites. The Environment Agency would be notified as soon as possible.			

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			Environmental sensitive receptors include the Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site. All protected sensitive receptor sites are a significant distance from the Westwood AD installation and there is no hydraulic connection.			
Odour from waste acceptance – waste reception building (under	Local receptors	Atmosphere. Failure of odour	The waste reception and process building is to be served by new purpose designed and engineered negative air extraction system maintaining a minimum of three air changes per hour. Extracted	Planned maintenance will minimise the risk of plant malfunction,	Detriment to local amenities	Low or Medium risk of exposure in the event

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abnormal operation)		abatement equipment within the waste reception and process building.	odorous air is to be channelled through to a carbon filtration system for treatment prior to emission to air via a 12.7 metre high stack to aid dispersion. The odour abatement systems will be subject to periodic checks and maintenance in accordance with the Odour Abatement Maintenance Procedure. The effectiveness of the odour abatement systems will continue to be tested weekly with the use of H_2S and NH_3 RAE tubes (inlet and outlet). In addition to this, 6 monthly emissions testing is conducted for NH_3, H_2S and odour concentration including an odour removal efficiency test. Suitably qualified engineers and trained electricians are available on site in the unlikely event the extraction fans malfunctioned. The extraction system would be made fully operational as soon as possible. Spare parts are held on site.	however, unforeseen plant failure cannot be ruled out. The likelihood of odour impacting the local community is still considered low due to the distances and the sealed nature of the building.	Public dissatisfaction. Public reputational loss. The nearest receptor is the bridleway which is located to the south of the site. The nearest residential property is some 750	of plant failure but would be for a short duration.

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			The new purpose designed negative air extraction system and carbon filtration system is designed and engineered based on the existing size and air extraction requirements of the waste reception and process building. This is based on the current maximum feedstock storage capacity within the reception hall of approximately 400 tonnes at any one time. This will not need to increase or change as a result of a proposed increase in annual throughout from 65,000 to 110,000 tonnes per annum as the size and footprint of the building will not change. As such, there is no requirement to increase the size of the waste reception building which will remain at approximately 13,000m^3 based on a minimum of 3 air changes per hour so total air flow will be 39,000m^3/hr. Consequently, there will be no increase in the volume of air to be treated within the		meters from the site.	

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			reception building. For that reason, the volume of air and the rate of extraction from the waste reception building will remain the same and the rate of extracted air passing through the newly designed carbon filtration system will be unaffected. There will be no increase in the mass of emissions released to air. The air residence time or contact bed time within the carbon filter is designed at 1.5 seconds. There will be no changes to the nature of feedstocks and no changes to the composition of the extracted air passing through the carbon filter. Odour emissions modelling is provided in **Document Reference WWOEM1**. The maximum storage capacity in the reception building is approximately 400 tonnes at any one time. An increase in the maximum annual throughout to 100,000 tonnes is equivalent to an approximate maximum 301 tonnes of feedstock to			

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			be accepted each day between Monday to Sunday which equates to only an additional 123 tonnes per day. This is comparable to approximately 5 additional articulated vehicle loads per day. As part of the gas to grid expansion proposals, the Westwood facility will be operational 24 hours a day 7 days a week due to the nature of the AD process. However, waste processing will take place between 06:30-18:00hrs Monday to Sunday giving a total of 80.5 hours maximum process time per week. Currently waste processing takes place between 07:00-19:00hrs Monday to Friday and between 07:00-13:00hrs on Saturdays giving a total of 66 hours maximum processing time. The reception hall is designed to provide more than adequate storage capacity under an increased annual throughput of 100,000 tonnes per annum. Should no pre-treatment or processing of feedstocks take place, in accordance with the proposed increase in			

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			feedstocks to a maximum of 301 tonnes per day, it would take over 1.5 days to exceed the maximum storage capacity available within the reception building. Following loading into the hoppers, the feedstock will continue to be passed through 1 of 2 hammermills (de-packaging plant) and a macerator to process down to a particle size of 12mm (CCP1). The hammermills and macerators are subject to routine maintenance. Each hammermill can process approximately 138 tonnes (276 tonnes combined) per day throughout the proposed 11.5 hour shift pattern which is equivalent to approximately 10-12 tonnes per hour each. Removed contamination predominantly in the form of plastics is currently subject to hot washing then compaction to be squeezed prior to collection			

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			within a designed RoRo container pending removal for site for disposal elsewhere. All macerators are maintained in accordance with documented maintenance procedures and the 12mm front end macerators can process a maximum of approximately 20 tonnes an hour. Once de-packaged, feedstock is subject to maceration prior to discharging into the RWBT tank via Netzch pumps. A spare standby macerator and Netzch pump are held onsite in the event of malfunction to enable processing to continue with minimal disruption. Each hammermill will be subject to a complete overhaul as part of the proposals. The 2 hammermills and front end 12mm macerators processing rates of 10-12 tonnes per hour would enable the maximum storage capacity of 400 tonnes at any one time within reception to be processed within approximately 33 hours			

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			processing time (assuming no new feedstocks were accepted). 123 tonnes per day of additional feedstock as a result of an increase in annual throughout to 110,000 tonnes per annum is equivalent to approximately 5 additional articulated vehicle movements delivering feedstock a day. No upgrade to existing front end plant and equipment or new items of plant or equipment are required for the proposed increase in annual throughout from 65,000 to 100,000 tonnes per annum. All existing front end critical plant and equipment, including the hammermills, macerators and the Borger separator are more than capable of achieving the required increase in processing rate as part of this variation application.			

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			The odour abatement equipment is subject to regular checks and maintenance in accordance with the Odour Abatement Maintenance Procedure.			
Plant and equipment failure resulting in leaks	Land Surface waters Groundwaters	Infiltration through soil, drainage system, direct runoff	All process tanks are steel glass fused brand new purpose built designed to contain food waste. Digestate storage tank 1 will be subject to a full degrit and structural integrity assessment by an independent qualified specialist prior to recommissioning. All tanks have a minimum 30-year design lifespan. All tanks will be subject to a full degrit as required in accordance with operational demand. An internal structural integrity assessment will take place by an independent qualified specialist following a degrit.	Very unlikely. Purpose built high specification equipment contained within a secondary containment area and/or sealed drainage system. Regular inspection and maintenance to minimise failure.	Land contamination Surface water pollution Groundwater pollution Environmental sensitive receptors including Nene Valley Gravel Pits Ramsar and	Low

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			All tanks will be visually checked and inspected as part of the documented daily checks procedure. In the very unlikely event of tank failure resulting in a leak of spillage, all process tanks are positioned within an impermeable concrete bunded area served by impermeable surfacing and sealed drainage. All process and storage tanks are located within a clay lined bund. The CIRIA risk assessment results in a 'low' risk classification for the Westwood site, which therefore requires Class 1 design to C736 guidance. Unlined earth bunds are an allowable design for class 1 sites, with C736 specifying a minimum thickness of 1m of Clay with an impermeability lower than 1x 10^{-09} m/s. The bund at Westwood exceeds these minimum criteria, with a greater thickness of material with significantly lower permeability. It is noted that there is a localised low spot to the northwest corner of the		SPA within 10km of site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site.	

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			earth bund. This is to be remediated by clearing the area of topsoil / vegetation, exposing the underlying Clay bund and compacting suitable impermeable Clay under Engineering supervision. This will be brought up to match the level of the adjacent concrete bund wall (98.410mAOD). Once completed, the available containment volume for the bund is modelled as 14,008m^3 which exceeds the required volume of 10,875m^3 (**document references WWCCA1, WWCM1 & WWBGIR1**). As such, any leak or spillage within the secondary containment area would be isolated and contained accordingly. Any leak or spillage within the front concrete apron area would be contained. This area is designed and engineered to drain towards the front gully drains and then enters the sealed drainage system.			

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			All relevant pipework will be fitted with pressure alarms, flow meters and Pressure Relief Valves (PRVs). PRVs will be installed on the RWBT, all 5 Digesters, both Pasteuriser Tanks, and both gas holders for example. All PRVs will be connected to SCADA and equipped with proximity sensors. All above ground pipework will be checked daily and recorded on daily check sheet. If required, any below ground pipework will be periodically pressure tested. All pumps on site will be regularly maintained in accordance with the manufacturers recommendations. Key parts and spare pumps for example will be retained on site at all times in the event of malfunction to minimise operational disruption. The process pipework is of high quality infrastructure and will continue to be constructed of			

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			stainless steel providing an easy means of checking and maintenance. Any failure within the waste reception building and the pump room would flow into the sealed drainage system for treatment through the process or pending removal offsite by a registered waste carrier to a suitable permitted facility. Any leaks or spillages within the gas to grid infrastructure would be contained within the sealed units. This would be contained and remediated appropriately pending disposal or recovery elsewhere. All plant and equipment will be serviced and maintained, and records will be kept for inspection.			

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			Environmental sensitive receptors include the Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site. All protected sensitive receptor sites are a significant distance from the Westwood AD installation and there is no hydraulic connection.			
Release of contaminated water from secondary containment area sump	Surface waters Groundwaters	Infiltration through soil, drainage system	Strict documented management procedures in accordance with the ensure daily checks are undertaken of the secondary containment area bunded area. Daily inspections look for any evidence of leaks or spillages within the containment area which is likely to cause	Unlikely. All process tanks are newly installed purpose designed tanks with a minimum 30-year design lifespan and	Surface water pollution Groundwater pollution Environmental sensitive	Low

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			contamination to captured rainwater. These checks will be recorded and will be available for inspection. The site manager or duty manager will be responsible for ensuring any captured rainwater is suitable to be released to the onsite surface water pond should it not be put through the process for treatment to offset mains water consumption. This includes opening the sluice to allow water to enter to the offsite reedbed system and drainage ditch from the pond. A visual inspection will take place and an ammonia test prior to release. All results will be recorded and retained for inspection. Captured rainwater will be stored in the 140m^3 FOG tank within the bund. This is entirely a manually controlled system in accordance with a documented Sump Inspection and Release Procedure (Westwood). Only once the manager is satisfied there have been no spillages and following testing,	are engineered to prevent leaks. Captured rainwater can only be discharged manually following treatment and testing and therefore will be checked prior to release. In the unlikely event contaminated water from within the bund was released accidentally to the pond, the sluice would remain closed	receptors including Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife	

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			the sump water will be allowed to discharge to the drainage system connected to the pond. The pond is equipped with an aerator to increase dissolved oxygen levels. Any contaminated water including an ammonia concentration of greater than 2ppm will not be released to the surface water system and will be put through the treatment process. All condenstate is returned to the treatment process at all times. All captured rainwater drains to the below ground sealed sump at the lowest part of the secondary containment area. All condensate from the gas lines drains to separate isolated sump prior to being pumped back into the treatment process. The sumps will be inspected daily for levels and for structural integrity (where structural integrity is in doubt hydraulic testing will be undertaken). All	at all times except when opened to prevent release from site to the reedbed system and drainage ditch system.	Sites (CWS) within 2km of site.	

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			below ground sumps are served by submersible pumps and are monitored on SCADA. Any captured rainwater which is to be released to the surface water system is subject to treatment in the form of aeration for example to reduce ammonia. All captured rainwater within the gas to grid infrastructure area including the access road drains to the process tank secondary containment area served by impermeable surfacing and sealed drainage. This rainwater is subject to the same treatment as all other captured rainwater. Surface water from the front concrete apron will continue to drain to the onsite surface water attenuation pond. Environmental sensitive receptors include the Nene Valley Gravel Pits Ramsar and SPA within 10km of			

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			site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site. All protected sensitive receptor sites are a significant distance from the Westwood AD installation and there is no hydraulic connection.			

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Flooding of site	Land Groundwater, Surface waters	Flood waters	A flood risk assessment was undertaken in support of the original planning application for the Westwood AD Facility 2008. The risk of flooding from rivers was regarded as 0.1% (1 in 1000) or less. A flood risk assessment was also undertaken in support of the variation to the planning permission to incorporate gas to grid operations and for increased tonnages in 2024. The risk of flooding from surface waters was regarded as low at 0.1%-1% chance. The risk of flooding from rivers and the sea was very low at less than 0.1%. The site is located within a Flood Zone 1 of low probability of flooding.	Very unlikely. In the very unlikely event of flooding on site, the Emergency Preparedness and Response Procedure and Environmental Accident Management Plan would be implemented.	Land contamination Surface water pollution Groundwater pollution Environmental sensitive receptors including Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey	Low

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			All waste is contained either within the building or within purpose designed new tanks. All waste accepted on site is non-hazardous. The surface water pond onsite would effectively provide tertiary containment for any contaminated runoff in the unlikely event of flooding. The surface water pond has the capacity to store a 1 in 100-year return period storm. Environmental sensitive receptors include the Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site. All protected sensitive receptor sites are a significant distance		Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site.	

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			from the Westwood AD installation and there is no hydraulic connection.			
Methane / gas release	Air quality Public health Public nuisance	Atmosphere	The gas generated from within Digesters 1 and 2 will be stored in an existing gas holder before being used as fuel in existing Combined Heat and Power (CHP) units. Digesters 3, 4 and 5 will be stored in a new larger gas holder prior to being transferred to a Biogas Upgrade Plant (BUP) and a Gas Export Unit	Unlikely. The risk of large releases to atmosphere is very unlikely due to the	Detriment to health Public nuisance	Low

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			(GEU) pending export to the national grid via a gas pipeline. Both gas holders will consist of an inner membrane which contains the gas and an outer membrane which is inflated by forced ventilation. If the inner membrane was to leak, the void between the inner and outer membranes could become an explosive environment. Therefore, the void area between the two membranes will be continually subject to forced ventilation. The gas holders will be specially designed and installed to the highest specification. The site is subject to periodic DSEAR conformance assessments. DSEAR plans will be available on site and electronically, which have been revised in advance of any infrastructural changes made.	control measures in place.	Reputational loss Environmental sensitive receptors including Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse	

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			The continuous nature of the process together with the engineered safety controls in place ensures additional storage capacity will be available within both gas holders at all times. Gas pressures are continuously recorded on SCADA. In the event of elevated gas pressures, the site has been designed and engineered that in the event of total CHP failure from both engines together with loss of connection to grid, the auxiliary gas flares will automatically activate in order to burn any excess biogas prior to the Pressure Relief Valves (PRVs) releasing to atmosphere ultimately followed by the release of the condensate pits / water (gas traps). The existing flare will be repositioned adjacent to the new Gas to Grid flare. Both auxiliary gas flares will provide a 100% burn rate and would auto ignite when the capacity of each of the gas holders reaches a pre-determined level or volume		Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site.	

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			and would reduce the gas holder volume down to a pre-set limit in accordance with current SCADA controls. Pressure Release Valves (PRVs) will be installed on all 5 Digesters, both Pasteurisers, , the RWBT and both gas holders. The PRVs would release at 25mb. By installing an additional gas holder to serve the gas to grid operations, and to allow for an additional digester, gas levels and available storage capacity can be maintained throughout the process to allow for an increase in feedstock acceptance and biogas production. The sites critical control measures would continue to demonstrate the gas mass balance would be maintained at equilibrium at all times throughout the facility both for gas to engines and gas to grid operations (See Gas Mass Balance **document reference WWGMB1**).			

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			The current auxiliary gas flare was utilised for 146 hours in 2024 which equates to 2% of the total available operational hours for the year and was comfortably within the allowable 10% limit. In 2023 the flare was utilised for 97 hours which equates 1.1% and in 2022 215 hours equivalent to 2.45% usage. Both auxiliary gas flares will be used during essential plant maintenance and/or in an emergency. CHP gas flow rates, gas to grid gas flow rate, flare flow rates and flare operating hours will be recorded on SCADA and on a Plant Monitoring Spreadsheet. Gas pressures are also recorded on SCADA. A proposed increase in annual throughput from 65,000 to 110,000 tonnes will increase biogas generation by approximately 5,723,100m^3 per			

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			annum based on 127.18m^3 of biogas produced per tonne of feedstock to 13,989,800m^3. This would equate to approximately 1,597m^3 of biogas produced per hour for both CHP and gas to grid operations. Of this 13,989,800m^3 of biogas, approximately 64% is likely to be generated for export to gas to grid at approximately 8,953,472m^3 per annum which is equivalent to approximately 1022m^3 of biogas produced per hour. Of the 13,989,800m^3 of biogas generation, approximately 36% is likely to be produced for gas to engine generation at approximately 5,036,328m^3 per annum which is equivalent to approximately 575m^3 of biogas produced per hour. In the unlikely event the CHP engines completely malfunctioned, and gas to grid network was unavailable, gas would be recirculated back to the their respective digesters. In the event flaring was			

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			required, both flares will have a design burn rate to exceed the maximum rate of biogas production to burn all surplus biogas should the rate and level of biogas generation not decrease through reduced feeding and stopping mixing. The Westwood AD Facility currently has 3 Jenbacher CHP engines which will remain in operation to convert biogas into electricity and heat. The electricity is initially utilised within the plant (parasitic load) and the remainder is sold via purchase power agreement to National Grid or to a third-party user. The CHP units will continue to be subject to routine servicing to maintain maximum combustion efficiency. Records of all monitoring undertaken and for maintenance carried out are stored and available on request. Biogen operate a very intensive			

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			maintenance regime to ensure the optimal performance of both the CHP engines. This is contracted to a specialist third party, Clarke Energy. This includes, but not limited to, 60,000 hour operating services which involves the engine being removed from site for a full service and recommissioning. This ensures the CHP is maintained to the highest standard. Both engines are fitted with a 'Leanox System', which evaluates the gas quality and adjusts itself to ensure the most efficient burn of the gas and eliminating any methane slippage that could occur. By having this advanced technology on the CHP engines and also by maintaining it to such a high level, Biogen believe they are operating to the current highest level of BAT.			

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			Emissions from the CHP combined stack are subject to annual testing. The 3 CHP engines ran for a combined total of 25,581 hours in 2024 (97.97% of availability) and 24,873 hours in 2023 (94.65% of availability). The plant exported 20,945 MWh of electricity in 2024 and 18,682 MWh in 2023. In 2022 the engines ran for a total of 25,561 hours (97% of availability). In 2021 the engines ran for a total of 25,606 hours (97% of availability). The latest annual CHP engine emissions testing on 16th October 2025 confirmed that all parameters were within the current permitted ELVs. The site will continue to be subject to 6 monthly Leak Detection and Repair (LDAR) surveys in accordance with the LDAR Procedure. The external process tanks are gas tight and therefore under normal operating conditions there			

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			will be no releases to atmosphere. The pipework and tanks are fitted with over-pressure valves; these would only activate during abnormal event. The PRVs will be inspected and tested monthly. The pressure relief valves will also be serviced on a 3-yearly basis, or when tanks are de-gritted (whichever is the sooner). There is a Leak Detection and Repair (LDAR) programme in place, with twice yearly site-wide surveys completed using an Opgal EyeCsite camera. Biogen has purchased a Opgal EyeCsite gas detection camera at considerable cost and members of the Biogen compliance team are trained to use the camera to assist with the LDAR programme across the business. Where a methane leak is detected, corrective actions will be put in place. By having our own gas detection camera, we			

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			are in a position to not only fulfil the six monthly LDAR requirement, but to also address any potential concerns around methane slippage which can be investigated and resolved. Biogen has an appointed Technical Compliance Manager who oversees the LDAR schedule and monitoring schedule. Gas levels and pressures are continuously monitored on SCADA. Environmental sensitive receptors include the Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site. All protected			

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			sensitive receptor sites are a significant distance from the Westwood AD installation.			
Unauthorised entry/arson and/or vandalism causing pollution incident	Land Groundwater Surface waters Public Local amenities	Surface runoff Atmosphere Potable water supplies	The site is securely fenced to prevent other unauthorised entry with appropriate signage. The site is located in a remote rural location with a private access/egress driveway and is not readily accessible by car. The site will be covered by remotely accessible CCTV system and equipped with an intruder alarm. The site will be supervised during normal working operations. As part of the gas to grid expansion proposals, the Westwood AD Facility will be operational 24 hours a day 7 days a week due to	Unlikely.	Soil contamination Surface water pollution Air pollution Public nuisance	Low

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			the nature of the AD process. Waste processing will take place between 06:30-18:00hrs Monday to Sunday. Currently waste processing takes place between 07:00-19:00hrs Monday to Friday and between 07:00-13:00hrs on Saturdays. There are security doors and locks on all valves to prevent tampering. An end of operations lock up / shutdown procedure is in place to ensure the site remains secure at all times.			
Catastrophic failure of process and storage tanks	Public Land Surface waters	Atmosphere Surface runoff Soil infiltration	All storage and process tanks will be rebuilt to have a minimum 30-year design lifespan in accordance with BS ISO 15686 Part 1 and incorporate the relevant international standards. The tanks will be constructed of glass fused steel and comply with BS5502 parts 50 and 22. Catastrophic failure of a	Very unlikely	Public health implications Public nuisance	Low

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	Groundwater		tank is very unlikely. However in the event of tank failure the material would be contained within the secondary containment area and would not escape the operators control. The tanks and pipework will be pressure tested to ensure integrity. Tanks and pipework will be fitted with pressure alarms, flow meters and Pressure Relief Valves (PRVs) monitored on SCADA. All-purpose built tanks will be designed and constructed to prevent leakage or overfilling. All storage tanks are to be fitted with two sets of high level tank detection probes continuously monitored and connected to SCADA. In addition to this they are hard-wired to automated valves and feed pumps to shut down all feeding into the tanks when activated. The high level tank detection		Soil contamination Surface water pollution Groundwater pollution Environmental sensitive receptors including Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey	

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			probes are subject to monthly testing. In addition, all tank levels will be visually checked daily (where possible) and the findings recorded on a daily checklist. Multiple flood probes will be positioned throughout the site including within the storage and process tank area at the lowest points. Flood probes will be monitored on SCADA and will be subject to monthly recorded checks. All tanks are maintained in accordance with the manufacturers recommendations and subject to daily visual checks. Recorded integrity checks are undertaken for all tanks following a degrit by a qualified third party at least every three years. C736 guidance recommends that the secondary containment volume is the larger of 25% of the bund		Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site.	

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			capacity or 110% of the largest tank. 25% of the proposed total primary containment capacity is 43,500m^3 = 10,875m^3, 110% of the largest tank (digestate storage tank) is 9,700m^3 = 10,670m^3. At Westwood 25% of the total inventory dominates and the required secondary containment capacity is 10,875m^3. The total secondary containment capacity provided by the existing bund of 14,008m^3 exceeds the required figure of 10,875m^3, and therefore the secondary containment bund has adequate volume. Boreholes drilled identified that the containment bunds are formed from Clay identified predominantly as the Oadby member – Diamicton. Samples were extracted from this material for laboratory permeability testing, which gave results for Coefficients of Permeability of 5.3 x 10^{-11} m/s			

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			and 1.2 x 10^{-10} m/s. These permeability values are significantly lower than the required threshold of 1 x 10^{-9} m/s contained within C736 and other similar guidance. Previous site investigation works completed during site construction in 2009 (Rolton Group, 12th February 2009) also proved that the in situ soils were an 'impermeable' clay with measured permeability lower than C736 requirements. SLR have completed a C736 risk assessment for the Westwood site using the Anaerobic Digestion and Bioresources Association (ADBA) methodology. (**Document reference WWADBARA1**). The risk assessment indicates that the site is considered to be 'low' risk, and therefore requires class 1 design. Unlined earth bunds are an allowable design for class 1 sites, with C736 specifying a minimum thickness of 1m of Clay with an impermeability			

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			lower than 1x 10^{-09} m/s. The bund at Westwood exceeds these minimum criteria, with a greater thickness of material with significantly lower permeability. It is noted that there is a localised low spot to the northwest corner of the earth bund. This is to be remediated by clearing the area of topsoil and vegetation, exposing the underlying Clay bund and compacting suitable impermeable Clay under Engineering supervision. This will be brought up to match the level of the adjacent concrete bund wall (98.410mAOD). Assuming the low spot is remediated, the available containment volume for the bund is modelled as 14,008m^3 which exceeds the required volume of 10,875m^3. In the unlikely event of a spillage from the tanks the Emergency Preparedness and Response Procedure would be actioned with immediate effect. All site staff receive training in emergency			

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			preparedness and response. Spill kits are available throughout the site and are periodically checked and stocked. In the unlikely event of significant spillage, incoming feedstocks would be diverted to Biogen's other AD sites. The Environment Agency would be notified as soon as possible. Environmental sensitive receptors include the Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site. All protected sensitive receptor sites are a significant distance from the Westwood AD installation and there is no hydraulic connection.			

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Explosion of gas	Public Air quality	Atmosphere	All process tanks will be gas tight vessels and therefore do not release into the atmosphere. The RWBT, Digesters 1 and 2, and both Pasteurisers, will all be connected to the common gas line to serve the gas holder for the CHP engines. Digesters, 3, 4 and 5 will be connected to the gas holder serving the gas to grid infrastructure. Biogas from within the gas to grid line will be passed through a gas scrubber independently prior to the gas holder. Both gas holders serving the CHP engines and gas to national grid will consist of an inner membrane which contains the gas and an outer membrane which is supported by a flow of air at pressure. In	Unlikely.	Public health implications Damage to local amenities Environmental sensitive receptors including Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey	Low

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			the unlikely event the inner holder was to leak, the space between the inner and outer membranes could become an explosive mixture environment. As such, the area between the two membranes is continually subject to forced ventilation so that the area between the membranes and the outer area are designated as a zone two in accordance with DSEAR. The gas holders are specially designed & installed to a high specification. Gas entering the Biogas Upgrade Plant (BUP) pending export to the national grid will be subject to further H_2S removal, compression, condensate removal and CO_2 removal by being passed through a series of membranes which are impermeable to CO_2 and allow CH_4 to pass through with a minimum CH_4 composition >97% to produce biomethane.		Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site.	

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			Propane will be stored in tanks and will be injected to increase the calorific value of the biomethane. TDT will be injected prior to entry to the national grid as an odourant. The gas generated from within Digesters 1 and 2 will be stored in an existing gas holder before being used as fuel in two Combined Heat and Power (CHP) units (see section 8.0). Digesters 3, 4 and 5 will be stored in a new gas holder prior to being transferred to a Biogas Upgrade Plant (BUP) and a Gas Export Unit (GEU) pending export to the national grid via a gas pipeline. So called reject gas which fails to meet the gas to grid composition and quality will be diverted back to Digesters 3, 4 and 5. The site is subject to periodic DSEAR conformance assessments. DSEAR plans will be available on site			

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			and electronically, which have been revised in advance of any infrastructural changes made. The continuous nature of the process together with the engineered safety controls in place ensures additional storage capacity will be available within both gas holders at all times. The gas holders will be maintained at a typical gas pressure of approximately 15mb. Gas pressures are continuously recorded on SCADA. In the event of elevated gas pressures, the site has been designed and engineered that in the event of total CHP failure from the engines together and/or loss of connection to grid, the auxiliary gas flares will automatically activate in order to burn any excess biogas prior to the Pressure Relief Valves (PRVs) releasing to atmosphere ultimately followed by the release of the condensate pits / water (gas			

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			traps). The existing CHP flare will be repositioned adjacent to the new auxiliary flare. A new gas flare will be installed to serve the gas holder providing gas to the GEU for the national grid. Both auxiliary gas flares will provide a 100% design burn rate and would auto ignite when the capacity of each of the gas holders reaches a pre-determined volume or pressure and would reduce the gas holder volume down to a pre-set limit in accordance with current SCADA controls. Pressure Release Valves (PRVs) will be installed on all 5 Digesters, RWBT, both Pasteurisers, both gas holders, the BUP and the GEU. As a result, storage capacity within the gas holders will be maintained throughout the process. By installing an additional gas holder to serve the gas to grid operations, and to allow for an additional digester, gas levels and available storage capacity can be maintained			

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			throughout the process to allow for an increase in feedstock acceptance and biogas production. The sites critical control measures would continue to demonstrate the gas mass balance would be maintained at equilibrium at all times throughout the facility both for gas to engines and gas to grid operations. Environmental sensitive receptors include the Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site. All protected sensitive receptor sites are a significant distance from the Westwood AD installation.			

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Incompatible substances allowed to come into contact/Unexpec-ted reactions	Land Surface waters Groundwater Public	Accidental release Explosion Atmosphere Surface water runoff	No chemicals/substances will be stored or used onsite without prior approval of the Operations Director. Material Safety Data Sheets will be kept on site and electronically for all chemicals/ substances. All chemicals/substances will be stored within secondary containment where necessary. This includes for example ferrous chloride and Trace Element Additive (TEA). A strict Feedstock Pre-Acceptance Procedure (**document reference WWFPAP1**) with pre-acceptance checks and a Contaminated Feedstock Procedure (**document reference WWCFP1**) is in	Unlikely due to the management procedures in place and rigorous monitoring.	Soil contamination Surface water pollution Groundwater pollution . Public health implications . Public nuisance	. Low

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			place which reduces the risk of non-conforming items.			
Wrong connections made to drains or other misconnections	Land Groundwater Surface waters	Wrong connection to surface waters	Plans are held onsite for all pipework including drainage plans as well as being available electronically. Any engineering works including reconfigurations will be carried out by experienced competent personnel familiar with the site design and layout. Any changes to pipework infrastructure including drainage will be accompanied revised drawings and plans. See **document reference WWSWDP1** for an existing site drainage plan. If required, any new drainage infrastructure would be subject to dye trace testing or a CCTV survey.	Very unlikely The use of trained personnel only. In the unlikely event of a misconnection, effluent would drain into the onsite rainwater harvesting pond and would be contained.	Soil contamination Surface water pollution Groundwater pollution Environmental sensitive receptors including Nene Valley Gravel Pits Ramsar and SPA within	Low

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			Uncontaminated rainwater captured within the secondary containment area will be pumped to an above ground 140m^3 FOG tank and discharged to the onsite surface water attenuation pond following treatment and ammonia testing. The surface water attenuation pond is equipped with an aerator. Subject to a visual assessment and an ammonia test of no greater than 2ppm concentration, the sluice gate will be opened to allow water to pass through to the reedbed system. This is entirely a manual operation and will be overseen by site manager or duty manager. All test results will be recorded and available for inspection. All rainwater captured within the process tank storage area will be pumped back into the waste reception building and put through the treatment process to offset mains water consumption if		10km of site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site.	

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			required. Any surplus rainwater captured within the process tank area will be released under controlled conditions to the surface water attenuation pond subject to assessment and testing. The volume of water released and the test results will be recorded and available for inspection on request. Any rainwater which is not suitable for release to the pond will be put through the treatment process. All condensate from the gas line will be collected, kept isolated and returned to the treatment process at all times. Rainwater captured within the front concrete apron will continue to drain to a gulley drain and will be kept isolated from site operations. This will be channelled through to the surface water attenuation pond.			

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What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who responsible for what?**	**How likely is this contact & reasoning behind**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequen-ce**
			Roof water will continue to be kept isolated from site operational areas and will diverted directly to the rainwater harvesting pond. The volume of water used in operations will be recorded. Environmental sensitive receptors include the Nene Valley Gravel Pits Ramsar and SPA within 10km of site, Sheeprack Wood, Halsey Wood ancient woodlands and Forty-foot Lane, Strawberry Hill Knottingley, Newton Gorse Green Lane, Sharnbrook Summit and Halsey Wood County Wildlife Sites (CWS) within 2km of site. All protected sensitive receptor sites are a significant distance from the Westwood AD installation and there is no hydraulic connection.			

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who responsible for what?**	**How likely is this contact & reasoning behind**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequen-ce**
Failure of Mains Services	Land Atmosphere Surface waters	Surface runoff Atmosphere	In the event of a mains power outage, the site has been designed and engineered that in the event of total CHP failure from both engines and/or loss of connection to grid, the auxiliary gas flares will automatically activate in order to burn any excess biogas prior to the Pressure Relief Valves (PRVs) releasing to atmosphere. The existing CHP flare will be repositioned adjacent to the new gas to grid flare. A new gas flare will be installed to serve the gas holder providing gas to the BUP for the national grid. Both auxiliary gas flares will provide a 100% burn rate and would auto ignite when the capacity of each of the gas holders reaches a pre-determined volume or pressure in accordance with current SCADA controls.	Unlikely, however in unforeseen circumstances, the back-up provisions and systems onsite would ensure the site was self-sufficient to prevent any potential adverse effects.	Land contamination Air pollution Surface water pollution	Low

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who responsible for what?**	**How likely is this contact & reasoning behind**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequen-ce**
			Pressure Release Valves (PRVs) will be installed on the RWBT, all 5 Digesters, both Pasteurisers, and both gas holders. As a result, storage capacity within the gas holders will be maintained throughout the process. By installing an additional gas holder to serve the gas to grid operations, and to allow for an additional digester, gas levels and available storage capacity can be maintained throughout the process to allow for an increase in feedstock acceptance and biogas production. The sites critical control measures would continue to demonstrate the gas mass balance would be maintained at equilibrium at all times throughout the facility both for gas to engines and gas to grid operations. Both auxiliary gas flares will be used during essential plant maintenance and/or in an emergency. CHP gas flow rates, gas to grid gas flow rate, flare flow rates and flare operating hours			

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who responsible for what?**	**How likely is this contact & reasoning behind**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequen-ce**
			will be recorded on SCADA and on a Plant Monitoring Spreadsheet. Gas pressures are also recorded on SCADA. In addition to the existing backup diesel generator which will continue to serve the gas to engines infrastructure, a second generator will be positioned on an impermeable concrete pad to maintain power to all protected supply equipment to serve the gas to grid operations. This will include, but no limited to, the fan blowers for both gas holders, both auxiliary flares, SCADA, control room sockets, roller shutter doors and CCTV for example. Each generator will be tested monthly and serviced yearly by an independent specialist. In the event of mains water failure, the process does not require high volumes of water. Captured rainwater from within the secondary containment			

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who responsible for what?**	**How likely is this contact & reasoning behind**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequen-ce**
			area can be put through the process to offset mains consumption. Biogen also recirculate from the RWBT or from the Digesters to front end processing to reduce water use. However, if additional water was required, water can be abstracted from the onsite surface water attenuation pond and/or from the existing FOG tank (to be renamed Water Tank). Minimal mains water is required for welfare facilities. Therefore a temporary failure in water supply would not be detrimental.			
Operator Error	Land Surface waters Groundwater	Accidental release to air, land or water	Regular training is provided to staff on plant and equipment operations and environmental awareness. The site has been designed such that in the event of operator error or plant malfunction any release of	Unlikely due to management systems in place and site design.	Soil contamination Surface water pollution	Low

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who responsible for what?**	**How likely is this contact & reasoning behind**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequen-ce**
	Atmosphere		material or substance would be contained within the site boundary. The site has been designed and engineered that in the event of total CHP failure together with loss of connection to grid, the auxiliary gas flares will automatically activate in order to burn any excess biogas prior to the Pressure Relief Valves (PRVs) releasing to atmosphere ultimately followed by the release of the condensate pits / water (gas traps) at 30mb. All process tanks are to be fitted with 2 sets high level detection probes continuously monitored and connected to SCADA. In addition to this they are hard-wired to automated valves and feed pumps. The high level tank detection probes are subject to monthly testing. In addition, all tank levels will be		Groundwater pollution Air pollution	

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**What is the overall risk?**
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs – who responsible for what?**	**How likely is this contact & reasoning behind**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequen-ce**
			visually checked daily (where possible) and the findings recorded on a daily checklist. Multiple flood probes are to be positioned throughout the site including within the storage and process tank area. Flood probes will be monitored on SCADA and will be subject to monthly recorded checks. Flood probes will be hardwired to stop feed pumps in the event of activation. Gas pressures are continuously monitored on SCADA. Staff receive Emergency Preparedness and Response training with a refresher every two years.			

Gas to grid downtime	Air quality Public nuisance	Atmosphere	In the event of sustained gas to national grid downtime for reasons beyond the operators control, the site has been designed and engineered to ensure overall operations will be undisrupted and will continue. The rate of feeding into Digesters 3, 4 and 5 would be reduced to decrease gas production and mixing stopped. So called rejected gas will be recirculated back to Digesters 3, 4 and 5. Methane compression will take place. This can be utilised as a contingency in the event of connection to national grid is unavailable. Methane compressed to less than 1% of the volume it occupies at standard atmospheric pressure. It is stored in hard containers at a pressure of 20-25 megapascals in cylindrical or spherical shapes. Compressed natural gas is used in modified traditional petrol/internal combustion engine vehicles, or in vehicles specifically manufactured for compressed natural gas use. Where gas to grid connection is unavailable, compressed methane could be transported via road tankers to be utilised elsewhere.	Unlikely	Public nuisance	Low

BIOGEN

Appendix 1 – Existing Site Drainage Map