

Environmental Risk Assessment

South West Water Ltd

Hayle Waste Water Treatment Works (WWTW)

Environmental Risk Assessment

December 2023

Environmental Risk Assessment

Revision	Date	Description	Author	Checked by	Reviewed by
01	October 2021	Environmental Risk Assessment – draft for client review	Josh Parsons	Talia Albertos Pico	Peter Duncan
02	September 2022	Environmental Risk Assessment – For issue to EA	Josh Parsons	Talia Albertos Pico	Peter Duncan
03	December 2023	Environmental Risk Assessment – draft for client review	Louise Parsons	Josh Parsons	Peter Duncan

CONTENTS

1. INTRODUCTION 1

2. METHOD OF RISK ESTIMATION 5

3. ENVIRONMENTAL RISK ASSESSMENT 6

4. REFERENCES 27

1. INTRODUCTION

This Environmental Risk Assessment (ERA) has been completed for South West Water Limited (SWW) for the site at Hayle Waste Water Treatment Works, Station Approach, St Erth, Hayle, TR27 6LA (the Site), which is collocated within the wider Sewage Treatment Works (STW). This ERA has been completed in accordance with prevailing Environment Agency (EA) technical guidance (Environment Agency, 2020). It is noted that this guidance replaces previous EA H1 Guidance (Environment Agency, 2011), however, the H1 methodology is considered to remain appropriate.

Environmental Risk Assessments have been completed for:

- Emissions / discharges to water (surface water, groundwater and site drainage); [Table 3.1]
- Environmental accidents and incidents; [Table 3.2]
- Odour; [Table 3.3]
- Noise and vibration; [Table 3.4]
- Fugitive emissions (including dust, mud, litter, pests and pollutants) [Table 3.5].and
- Emissions to Air [Table 3.6]

Environmental Risk Assessments are focused on the proposed biological treatment activities, as illustrated in Figure 1.1. Environmental risk is estimated using the 'risk matrix' provided in Section 2. This Environmental Risk Assessment identifies nearby sensitive receptors, with the Site Setting shown in Figure 1.2 for context.

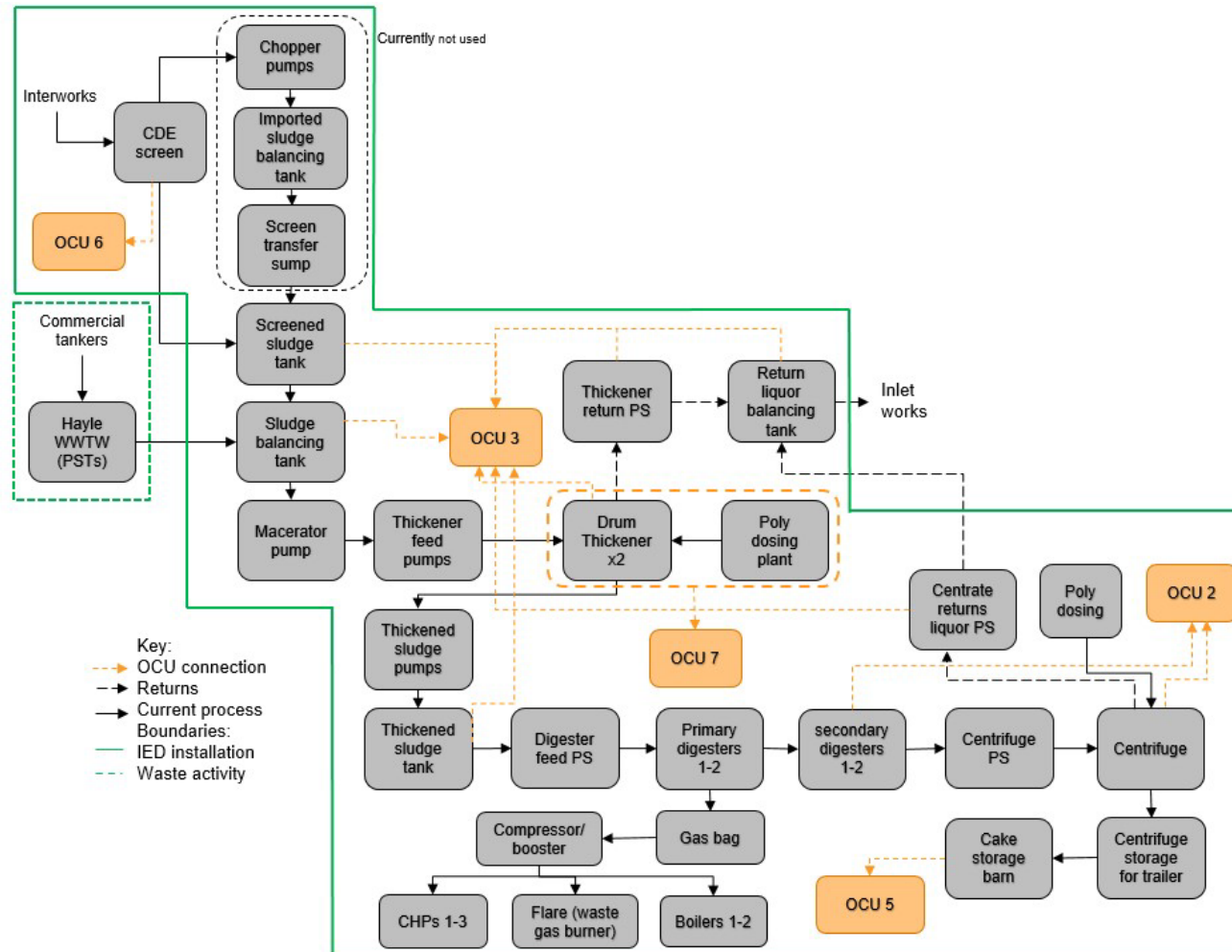
This ERA does not include specific reference to the training of staff, as this aspect of mitigation stretches across all aspects of risk management for the Site. SWW staff are provided with training which is specific to their role and only suitably trained staff are involved in the biological treatment activities. SWW have a training matrix which provides a record of staff training and prompts for refresher training, as required. SWW have a Technically Competent Manager who will oversee the biological treatment activities.

This ERA does not include reference to risks associated with flooding. This is due to the Site not being located within a Flood Zone¹. It should be noted that the adjacent areas to the east and south of the Site benefit from flood defences.

This ERA concludes that, accounting for the implementation of the mitigation measures, it is considered that the proposed installation will not have a significant impact on the environment.

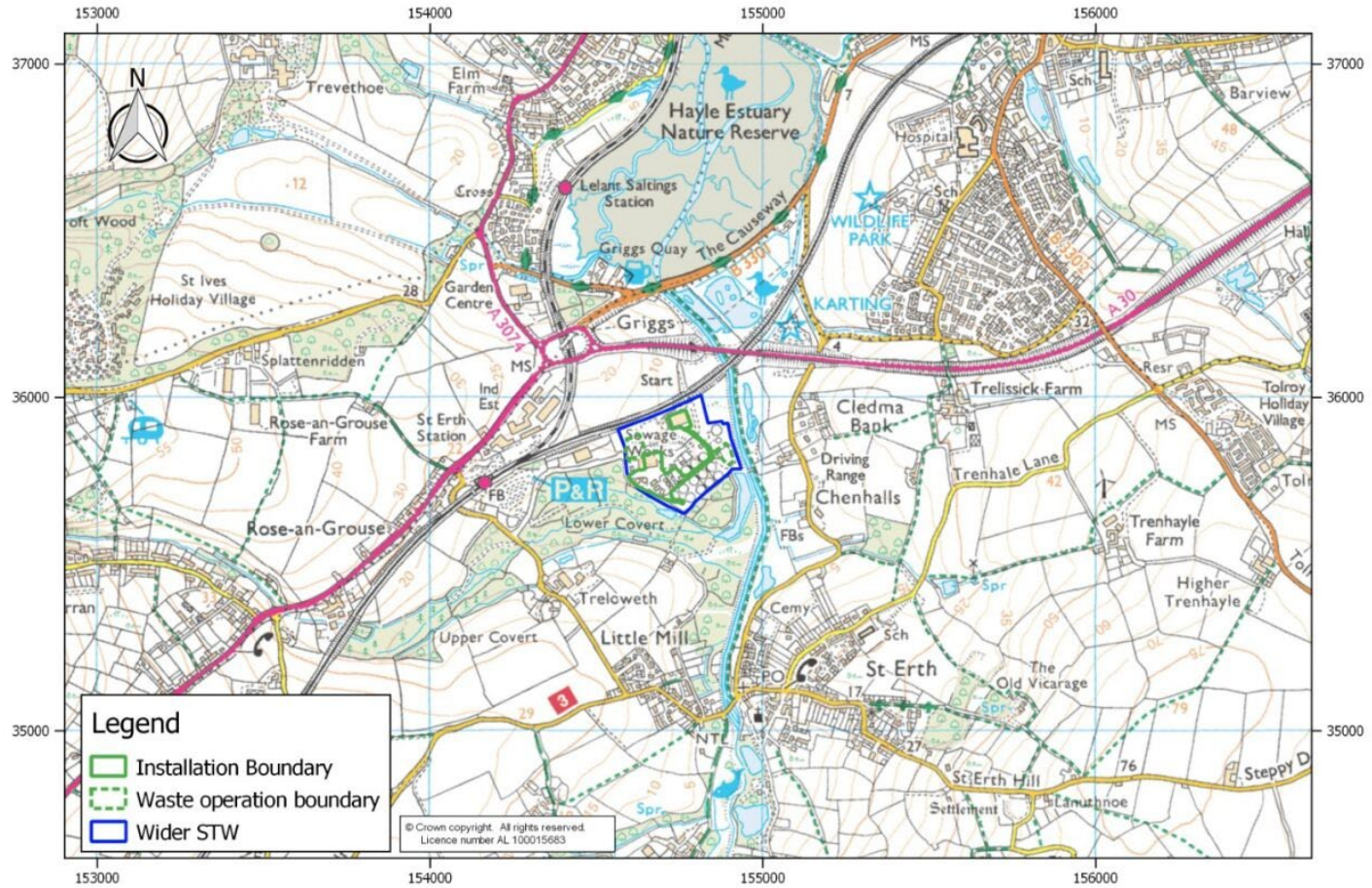
¹ Site not located within a Flood Zone, reference Flood Map for Planning, 2021 (<https://flood-map-for-planning.service.gov.uk>)

Figure 1.1 Anaerobic Digestion Activities – Process Flow Diagram



Note – Chopper pumps, imported sludge balancing tank and screen transfer sump not in use.

Figure 1.2 Site Setting



2. METHOD OF RISK ESTIMATION

Table 2.1 below has been used to demonstrate an estimation of risk from activities to be carried out within the proposed installation boundary. The estimation of risk is based on the magnitude of consequences from hazards associated with the activities carried out at the Site and the probabilities of these hazards occurring.

Table 2.1 Estimation of Risk

Risk ↘	<i>Consequences</i>			
	Severe	Moderate	Mild	Negligible
<i>Probability</i>				
High	High	High	Medium/low	Near Zero
Medium	High	Medium	Low	Near Zero
Low	High/medium	Medium/low	Low	Near Zero
Negligible	High/medium/low	Medium/low	Low	Near Zero

Although the above table is a simplification that cannot represent the true complexity of assessing risk on the Site, it has been used as a guide in preparing the Environmental Risk Assessment included in the subsequent sections of this report.

3. ENVIRONMENTAL RISK ASSESSMENT

Table 3.1 Emissions to Water (Surface Water, Groundwater and Sewer)

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?
Contaminants from the biological treatment operations reaching surface water features	Surface water features (closest being River Hayle which is located immediately to the east of the Site, where it flows northwards into the Hayle Estuary Nature Reserve c. 400 m to the north of the Site), series of tributaries located approx. 15 m south of the Site and pond located approx. 30 m east of the Site. Local flora and fauna associated with listed habitats.	Infiltration and surface water run-off	<p>SWW have an Environmental Management System, which has been prepared in accordance with prevailing EA Guidance (how to develop a management system: environmental permits). A copy of the Environmental Accident Management Plan (Appendix 13) is provided as part of this Environmental Permit application and prevalent points included below.</p> <p>A robust environmental quantitative risk assessment (EQRA) is provided as Appendix 6 to this EP application. The EQRA is based on the source-pathway-receptor model as prescribed by CIRIA C736, and in accordance with sector guidance. The EQRA provides an indication of BAT or BAT equivalent measures for the containment of fugitive emissions to ground/groundwater.</p> <p>The nearest surface water feature is the River Hayle, which is located immediately to the east of the Site. The Site is not located within a Groundwater Protection Zone; the nearest is over 3.2 km to the south west of the Site.</p> <p>Subject to further improvements, the surfacing on the Site is impermeable surfacing with sealed drainage. The site is laid to falls, with flows draining towards gullies with flows back to the head of the works for treatment. Kerbing and containment infrastructure are present to</p>	Negligible	Mild	Low
Contaminants from the biological treatment operations reaching groundwater	Surface water features listed above (ultimately reaching groundwater) and groundwater.			Negligible	Mild	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?
			<p>prevent infiltration and surface water run-off. Spills/leaks that may arise from the biological treatment operations that enters drains with flows draining towards gullies with flows back to the head of the works for treatment. Drainage surveys completed in 2023 identified improvements needed in places. Procurement for repair / replacement work to commence in December 2024. Refer to Improvement Plan for additional details.</p> <p>Spill modelling has been undertaken which has identified areas requiring secondary containment and impermeable surfacing to mitigate the risk of liquids leaving the site boundary in the event of a catastrophic failure, in accordance with CIRIA 736. Design options to be agreed and implemented in the short and long term, respectively. The secondary containment assessment contains spill modelling and proposed containment solution (Appendix 16). Further details are included in the Improvement Plan.</p> <p>SWW's Spill Prevention Plan outlines the response to spill incidents, including the response equipment used to clean up leaks / spills. Emergency spill kits are available in accessible locations.</p> <p>Discharge Consent No. NRA-SWW-0782 authorises the discharge of treated effluent to the required standards.</p>			

Table 3.2 Environmental Accidents and Incidents

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?
<p>Leaks and spills from plant/equipment, hazardous liquid containment facilities (e.g. polymer and fuel), tanks and pipework.</p> <p>Transfer of substances (e.g. filling and overfilling)</p>	<p>Nearby land uses, surface water features (closest being River Hayle which is located immediately to the east of the Site, where it flows northwards into the Hayle Estuary Nature Reserve c. 400 m to the north of the Site), series of tributaries located approx. 15 m south of the Site and pond located approx. 30 m east of the Site. Local flora and fauna</p>	<p>Surface water run-off, infiltration.</p>	<p>As above, the drainage system will contain any leaks/spills. Spills will be directed to site drains and retained in drainage sump (hazardous substances from leaks will not be acceptable to the process and therefore won't be directed to the head of works). Drainage surveys have identified improvements to the drainage system. Remedial actions are to be undertaken in line with the Improvement Plan.</p> <p>Hazardous liquids e.g. polymer and fuel are stored appropriately in bunded tanks/containers.</p> <p>Supervision of all fuel deliveries. Fuel delivery will take place in a designated area</p> <p>Spill modelling has been undertaken which has identified areas requiring secondary containment and impermeable surfacing to mitigate the risk of liquids leaving the site boundary in the event of a catastrophic failure, in accordance with CIRIA 736. Design options to be agreed and implemented in the short and long term, respectively. The secondary containment assessment contains spill modelling and proposed containment solution (Appendix 16). Further details are included in the Improvement Plan.</p> <p>SWW's Spill Prevention Plan outlines the response to spill incidents, including the response equipment used to clean up leaks / spills. Emergency spill kits are available in accessible locations.</p> <p>All plant and equipment on the Site are fitted with process monitoring equipment, which will continuously monitor the process to detect any faults which could lead to an incident. This system will raise an alarm if a fault has, or is likely to, occur. As an example, an alarm will activate if levels within a tank exceed a trigger limit in order to minimise the risk of overfilling. Alarms notify key staff who will act to resolve the issue.</p> <p>All plant and equipment on the Site are checked and maintained in line with manufacturers or design guidelines as part of a maintenance programme by SWW maintenance team. Checking for leaks is a specific</p>	<p>Low</p>	<p>Negligible</p>	<p>Near Zero</p>

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?
	associated with listed habitats.		item within the operational regime. This will act to reduce the likelihood of any loss of containment or leaks, alongside various control measures.			
Failure of plant / equipment e.g. from blockages, pressure, faulty pipework, valves, pumps etc. which could cause accidents / incidents e.g. injury, fire etc.	Staff on site (direct harm), woodland located directly adjacent to the south and west of the Site, residential land uses located approx. 80 m east of the Site and nearby industrial units located approx. and 230 m west of the Site	Direct – harm/injury, spread of fire. Air (air quality impact)	<p>SWW have an Environmental Management System (EMS), which has been prepared in accordance with prevailing EA Guidance (how to develop a management system: environmental permits). A copy of the Environmental Accident Management Plan (Appendix 13) is provided as part of this Environmental Permit application and prevalent points included below. SWW also have emergency procedures detailing actions to be taken in the event of a fire, including liaising with fire service, and notifying the EA (see EMS Summary in Appendix 3).</p> <p>A DSEAR assessment has been completed for site and only appropriate ATEX rated equipment may be used in high-risk areas. The Leak Detection and Repair (LDAR) Plan (Appendix 21) includes information on preventing and detecting gaseous leaks. All plant and equipment on the Site are fitted with process monitoring equipment, which will continuously monitor the process to detect any faults. This system will raise an alarm if a fault has, or is likely to, occur. As an example, an alarm will activate if pressure is low or the temperature of the pump exceed a pre-set limit. Alarms notify key staff who will act to resolve the issue.</p> <p>All plant and equipment on the site are inspected, maintained and calibrated (if applicable) as part of a maintenance programme. Operations and Maintenance (O & M) manuals inform the inspection and maintenance regime required for strategic assets. Alarms will trigger as part of a continuous monitoring system for all plant, which will ensure prompt response to faults. The maintenance programme incorporates requirements from the Leak Detection and Repair Plan (Appendix 21), which includes information on preventing and detecting gaseous leaks.</p> <p>Pressure relief and vacuum relief valves (PVRVs) are installed on all tanks where there is a risk of over or under pressurisation. The tanks are also fitted with pressure sensors to maintain safe operating pressure.</p>	Low	Moderate	Medium/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?
			<p>The gas bag is also fitted with a pressure relief valve at the inlet point. An inspection of the PVRV's has been completed with an improvement plan in place in the short-term to replace where required. See Improvement Plan for further details.</p> <p>Actions will be taken to fix plant / equipment in the event of a failure / breakdown to address the incident as quickly as possible. In some instances, a failure could have severe consequences i.e. a failure involving infrastructure managing biogas.</p> <p>Management may make the decision to stop operations by utilising manual stops on assets. This decision will be largely based on if the plant is integral to the operation and likely to pose a wider concern to the Site and/or the environment.</p> <p>Any firewater would enter drains on the Site and either be collected within a sump if unacceptable for treatment at the STW, or directed to the STW if it is possible to treat.</p>			
Fire e.g. from a fault in plant / equipment or from arson	Staff on site (direct harm), residential land uses located approx. 80 m east of the Site, nearby industrial units located approx. and 230 m west of the Site woodland located	Direct – spread of fire. Air (air quality impact)	<p>SWW have an Environmental Management System, which has been prepared in accordance with prevailing EA Guidance (how to develop a management system: environmental permits). A contingency plan in the event of a fire is detailed in the Fire Emergency Plan and communicated to all relevant parties. A copy of the Environmental Accident Management Plan (Appendix 13) is provided as part of this Environmental Permit application and prevalent points included below. SWW also have emergency procedures detailing actions to be taken in the event of a fire outlined in a Fire Emergency Plan, including liaising with fire service, mandatory training for site personnel and notifying the EA (see EMS Summary in Appendix 3).</p> <p>Waste accepted and treated on the Site is sludge and the resulting 'cake' and solids e.g. 'rags', which are not combustible in nature (as defined by EA Guidance for Fire Prevention). The majority of waste will have a high liquid content exceeding 95% by weight. A waste pre-acceptance,</p>	Low	Moderate	Medium/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?
	<p>directly adjacent to the south and west of the Site.</p> <p>Local amenity and flora/fauna associated with the above listed habitats and other land uses e.g. agricultural.</p>		<p>acceptance and rejection procedure (Appendix 18) is implemented to ensure robust waste characterisation and verification procedures are carried out to ensure only authorised wastes are received at the acceptance stage and that tracking procedures are followed.</p> <p>Water is immediately available on the site for use by the emergency services in the event of a fire. The site's drainage plan will be made available for emergency services on their arrival</p> <p>Biological treatment activities produce biogas, which is flammable and, if not properly managed, could cause a fire or explosion. Equipment involved in the management of biogas is checked and maintained as part of a maintenance regime</p> <p>Any firewater would enter drains on the Site and either; be collected within a sump if unacceptable for treatment at the STW, or directed to the STW if it is possible to treat.</p> <p>There are risks of fire/explosion on the Site from the storage and use of containerised hazardous (flammable) substances such as oils and gases, as well as the biogas as outlined above. A DSEAR assessment has been completed for site and only appropriate ATEX rated equipment may be used in high-risk areas.</p> <p>The Leak Detection and Repair (LDAR) Plan (Appendix 21) includes information on preventing and detecting gaseous leaks.</p>			
Flooding from blocked drains, burst pipes, and handling fire water	Nearby land uses, surface water features (closest being River Hayle which is located immediately	Overwhelmed drainage system and resulting surface water-runoff.	<p>SWW have an Environmental Management System, which has been prepared in accordance with prevailing EA Guidance (how to develop a management system: environmental permits). A copy of the Environmental Accident Management Plan (Appendix 13) is provided as part of this Environmental Permit application and prevalent points included below.</p> <p>Drainage system unlikely to be overwhelmed, as it is directly linked to the STW. Drainage gullies are visually inspected on a regular basis to ensure they are operational e.g. no blockages. Drainage improvements are detailed in the Improvement plan.</p>	Negligible	Moderate	Medium/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?
	to the east of the Site, where it flows northwards into the Hayle Estuary Nature Reserve c. 400 m to the north of the Site), series of tributaries located approx. 15 m south of the Site and pond located approx. 30 m east of the Site. Local flora and fauna associated with listed habitats.		<p>Impermeable surfacing and containment infrastructure is present on the site with additional areas to be improved in response to the Environmental Quantitative Risk Assessment (Appendix 6 to the EP Application). Spill modelling has been undertaken which has identified areas requiring secondary containment and impermeable surfacing to mitigate the risk of liquids leaving the site boundary in the event of a catastrophic failure, in accordance with CIRIA 736. Design options to be agreed and implemented in the short and long term, respectively. The secondary containment assessment contains spill modelling and proposed containment solution (Appendix 16). Further details are included in the Improvement Plan.</p> <p>Pipes are inspected as part of the maintenance programme.</p>			
Failure of services e.g. water, gas, electricity which could result in the failure of plant e.g. from overheating, which in turn could cause a fire	Staff on site (direct harm), residential land uses located approx. 80 m east of the	<p>Direct – spread of fire.</p> <p>Air (air quality impact)</p>	SWW have an Environmental Management System, which has been prepared in accordance with prevailing EA Guidance (how to develop a management system: environmental permits). A copy of the Environmental Accident Management Plan (Appendix 13) is provided as part of this Environmental Permit application and prevalent points included below.	Negligible	Moderate	Medium/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?
	<p>Site, nearby industrial units located approx. and 230 m west of the Site woodland located directly adjacent to the south and west of the Site.</p> <p>Local amenity and flora/fauna associated with the above listed habitats and other land uses e.g. agricultural.</p>		<p>Risk management identified in above rows, specifically in relation to 'failure of plant' and 'fire'.</p> <p>The site has 2 back-up generators on site in the event of a loss of power scenario. SWW's Site Contingency Plan outlines when and how these will be utilised.</p> <p>The Site uses final effluent as a water source for cleaning/washdown operations. If water was not available then activities would stop if necessary.</p> <p>Plant and equipment are fitted with process monitoring equipment. An alarm would be activated, and staff notified if plant/equipment failed e.g. pumps were overheating.</p> <p>All plant and equipment on the site is inspected, calibrated and maintained in line with manufacturer and/or design guidelines as part of a maintenance programme. Alarms will trigger as part of a continuous monitoring system for all plant, which will ensure prompt response to faults.</p>			
<p>Unauthorised entry and damage to plant and equipment e.g. from vandalism</p>	<p>Staff on site (direct harm), residential land uses located approx. 80 m east of the Site, nearby industrial</p>	<p>Direct – harm/injury, spread of fire.</p> <p>Air (air quality impact)</p>	<p>SWW have an Environmental Management System, which has been prepared in accordance with prevailing EA Guidance (how to develop a management system: environmental permits). A copy of the Environmental Accident Management Plan (Appendix 13) is provided as part of this Environmental Permit application and prevalent points included below.</p> <p>Unauthorised entry could result in arson, see entry for 'fire' above.</p>	Low	Moderate	Medium/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?
	<p>units located approx. and 230 m west of the Site woodland located directly adjacent to the south and west of the Site.</p> <p>Local amenity and flora/fauna associated with the above listed habitats and other land uses e.g. agricultural.</p>		<p>Unauthorised entry could result in tampering / vandalism of plant and equipment, see 'failure of plant' above.</p> <p>In addition, SWW have a number of site security measures to include:</p> <ul style="list-style-type: none"> • Intruder alarm connected via telemetry to SWW control room, Exeter; • CCTV with recording and remote access; • Controlled site entry (i.e. electrically operated gate with call button); and, • Perimeter fencing <p>SWW's Site Contingency Plan outlines when and how these will be utilised.</p>			
Hazardous atmospheres in confined spaces	Staff on site, land uses in the vicinity of the site, atmosphere.	Air (Atmospheric Migration)	<p>There is a potential of explosion in the management of biogas. A DSEAR assessment has been completed for site and only appropriate ATEX rated equipment may be used in high-risk areas.</p> <p>The Leak Detection and Repair (LDAR) Plan (Appendix 21) includes information on preventing and detecting gaseous leaks.</p> <p>Relevant plant and equipment on the Site are fitted with process monitoring equipment, which will continuously monitor the process to detect any faults. This system will raise an alarm if a fault has, or is likely to, occur.</p>	Low	Severe	Medium

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?
			Contingency measures will be put in place, as appropriate, to ensure continuity in the treatment process and/or to reduce risk by stopping certain plant/processes. Details are included in the SWW Contingency Plan.			
Plant and equipment damage from extreme weather e.g., very high winds, extreme heat, freezing temperatures	<p>Staff on site (direct harm), could result in emissions to water (see Table 3.1) or fires.</p> <p>Local amenity, residential land uses located approx. 80 m east of the Site and nearby industrial units located approx. and 230 m west of the Site.</p> <p>Flora/fauna e.g. agricultural land,</p>	<p>Direct – harm/injury, spread of fire.</p> <p>Air (air quality impact)</p>	<p>The site has weather monitoring stations at appropriate locations to forecast wind speed and wind direction.</p> <p>The Crisis Management Plan details procedures to be taken and responsibilities in the event of Amber/Red weather warnings or any extreme weather event that may impact biosolid recycling. Should a critical event be identified, the Regional Bio-resources Manager circulates an initial event notification and schedules an initial Web-Ex to declare the event and management tasks to relevant SWW personnel.</p>	Low	Moderate	Medium/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?
	estuary/river habitats and woods.					

Table 3.3 Odour and Bioaerosols

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?
Odour from Biological Treatment activities	Staff on site (direct harm), local amenity, residential land uses located approx. 80 m east of the Site and nearby industrial units located approx. and 230 m west of the Site.	Air (Atmospheric Migration)	<p>An Odour Management Plan (OMP) is available for the Site (Appendix 9), which includes mitigation measures adopted by SWW to minimise odour. This OMP requires that all plant on Site limits the risk of causing an odour nuisance. All new plant installed on the site is designed and operated to minimise the risk of causing odour nuisance. The OMP includes key contacts and responsible parties in relation to odour control. The OMP is regularly reviewed to ensure mitigation measures remain appropriate and that actions are taken as a result of any odour related complaints.</p> <p>Biological treatment operations, where possible are carried out within a building and/or containers/covered tanks. e.g. sludge screen, reception tanks, strain presses, thickeners and some dewatering activities. Some processes are not covered due to operational/process restrictions, for example where covering could lead to oxygen depletion, which could result in methane generation and a potential explosive atmosphere. Further information is provided in the Odour Management Plan.</p> <p>Air/odour emissions from the sludge import tanks, sludge screen, drum thickeners and sludge tanks are extracted and treated by Odour Control Units (OCUs).</p>	Low	<p>Moderate</p> <p>May present more risk of nuisance in the summer months.</p>	Medium/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?
			<p>An OCU performance survey has been undertaken. Any upgrades and/or replacements identified in the survey will be considered and implemented as detailed in the Improvement Plan.</p> <p>All plant and equipment are fitted with process monitoring equipment. This equipment monitors the performance of assets and will continuously monitor these performance metrics. An alarm is activated in the event that any plant / equipment is not functioning as expected. Actions will be taken to rectify the issue. This will act to reduce the likelihood of odour generation.</p> <p>A maintenance programme is followed for plant and equipment present on the site. Plant will be checked regularly to ensure they are in good working order. This will act to reduce the likelihood of breakdown, which could result in odour emissions.</p> <p>The SWW website contains an area where the public can lodge a complaint and a site sign is present on site with contact details. Odour complaints will be recorded, and actions taken to resolve these complaints. Communications between SWW, the EA and the Environmental Health Department of Exeter City Council will be conducted in accordance with the Communication Plan in the Odour Management Plan. The Odour Management Plan includes</p>			

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?
			additional details of how SWW deal with complaints.			
Odour from general site activities associated with the biological treatment activities.			Good housekeeping is enforced on the Site to minimise the likelihood of odour emissions leaving the Site boundary. Housekeeping will include keeping doors to buildings closed, sealing covers, cleaning Site surfacing and dealing with spillages.			
Bioaerosol emissions from: <ul style="list-style-type: none"> • Screening Skip; • Sludge thickener building; • Secondary digesters; • Cake barn; and, Vents from OCU units	Staff on site (direct harm), local amenity, residential land uses located approx. 80 m east of the Site and nearby industrial units located approx. and 230 m west of the Site	Air (Atmospheric Migration)	<p>A Bioaerosols Risk Assessment is provided for the Site (See Appendix 10), which includes the results of bioaerosol baseline monitoring carried out in addition to mitigation measures for the Site to minimise bioaerosols.</p> <p>The monitoring was conducted in accordance with the EA guidance ‘M9: environmental monitoring of bioaerosols at regulated facilities’ and quantified concentrations of <i>aspergillus fumigatus</i> and <i>mesophilic bacteria</i>. Concentrations for both parameters were below the respective threshold levels.</p> <p>In summary, the Bioaerosol Risk Assessment, supported by the course of monitoring, indicates that the residual risk from all on-site sources generate a residual risk of very low or low.</p> <p>Site workers identified as vulnerable (i.e., those with respiratory complaints/asthma)</p>	Low	Moderate	Low/Very 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?
			<p>will be made aware of the potential for elevated ambient bioaerosols and will be provided with appropriate recommended face masks.</p> <p>All plant and equipment are fitted with process monitoring equipment. This equipment monitors the performance of assets and will continuously monitor these performance metrics. An alarm is activated in the event that any plant / equipment is not functioning as expected. Actions will be taken to rectify the issue.</p> <p>Wind speed and direction is also monitored by the SCADA system, to enable SWW to assess risk to nearby sensitive receptors located downwind of the bioaerosol sources.</p> <p>A maintenance programme, in line with manufacturer or design guidelines, is followed for plant and equipment present on the site. Plant will be checked regularly to ensure they are in good working order. This will act to reduce the likelihood of breakdown, which could result in bioaerosol emissions.</p>			

Table 3.4 Noise and Vibration

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?
<p>Noise and vibrations from biological treatment operations, notably those identified in the Noise & Vibration Risk Assessment:</p> <ul style="list-style-type: none"> • CHP (including exhaust) • Fans on air cooled radiators • Waste gas burner 	<p>Staff on site (direct harm), local amenity, residential land uses located approx. 80 m east of the Site and nearby industrial units located approx. and 230 m west of the Site.</p> <p>Local amenity and flora/fauna e.g. agricultural land, estuary/river habitats and woods.</p>	<p>Air (Atmospheric Migration)</p>	<p>A Noise & Vibration Risk Assessment (Appendix 11) has been prepared as part of this Environmental Permit application. Points below draw upon information from this assessment, including mitigation measures that are in place on the Site.</p> <p>All plant and equipment on the Site are fitted with process monitoring equipment, which will continuously monitor the process to detect any faults which could lead to excess noise. This system will raise an alarm if a fault has, or is likely to, occur.</p> <p>Plant which has the potential to generate significant noise (listed in 'hazards' column) are located at a significant distance from receptors. The CHP (including exhaust) is located within a high performance acoustically treated enclosure and designed for external applications.</p> <p>The CHP and fans on air cooled radiators are located such that surrounding structures provide further noise mitigation.</p> <p>The Waste Gas Burner is used intermittently i.e., when CHP's are unavailable.</p> <p>All plant and equipment on the Site are checked and maintained as part of a maintenance programme. This will act to reduce the likelihood of any fault / malfunction. The integrity of Site infrastructure, including acoustic enclosures are checked to ensure the</p>	<p>Medium</p>	<p>Mild</p>	<p>Low</p>

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?
			<p>risk of noise leaving the boundary of the Site is being sufficiently minimised.</p> <p>No recent noise complaints have been received for the Site.</p>			
Noise and vibrations caused by vehicle movements within the Site			<p>A Noise & Vibration Risk Assessment (Appendix 11) has been prepared as part of this Environmental Permit application. Points below draw upon information from this assessment.</p> <p>Deliveries would take place during the daytime hours only when background sound levels are higher.</p> <p>Vehicle movements are screened from noise sensitive receptors by existing structures.</p> <p>No recent noise complaints have been received for the Site.</p>	Medium	Negligible	Near Zero

Table 3.5 Fugitive Emissions (including dust, mud, litter, pests and pollutants)

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?
Dust emissions from biological treatment activities leaving the Site boundary.	Staff on site (direct harm), local amenity, residential land uses located approx. 80 m east of the Site and nearby industrial units located approx. and 230 m west of the Site. Local amenity and flora/fauna e.g., agricultural land, estuary/river habitats and woods.	Air (Atmospheric Migration)	The nature of the waste accepted on to the Site is not likely to generate significant dust emissions. Polymer used in the thickening and dewatering activities has the potential to generate dust. Polymer is used within a building and container, which will prevent dust emissions leaving the Site boundary. The Site is subject to regular visual inspections and a regular cleaning regime. This will ensure that any mud/residues on the Site surfacing is managed as required. A Residues Management Plan is in place to mitigate risk (Appendix 17).	Negligible	Mild	Low
Mud / residues reaching the public highway	Nearby public highway and nearby roads.	Tracking of mud on wheels / undercarriage of vehicles.	Waste stored and treated on the Site is not likely to generate mud/residues. Waste storage and treatment activities are largely contained, either within a building and/or containment e.g., tanks and skips.	Negligible	Negligible	Near Zero
Litter leaving the Site boundary		Air (windblown)	Waste stored and treated on the Site is unlikely to contain significant quantities of litter. Any solids within the waste are unlikely to become windblown, which could cause litter on the Site. There are skips located around the Site which contain general waste and screenings from different parts of the STW wastewater treatment process. There is a low risk of litter associated with these skips.	Negligible	Mild	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?
			<p>Fencing/screening around the perimeter of the Site prevents any windblown litter crossing the Site boundary.</p> <p>Site walkovers will be conducted to remove any litter from the Site, including from site fencing.</p>			
Pests and vermin infestation causing an amenity impact and potential damage to plant / equipment and infrastructure on Site.	Amenity impact – staff on site and nearby residential dwellings and industrial units.	Air transport and over land	SWW will conduct regular visual inspections to monitor potential pest/vermin infestations. SWW's Waste Permit Management procedure outlines that specialist contractors will be used to manage pest/vermin infestations.	Low	Mild	Low
Storage of liquids (hazardous or potential to cause pollution) e.g., polymer, fuel	Surface water features (closest being River Hayle which is located immediately to the east of the Site, where it flows northwards into the Hayle Estuary Nature Reserve c. 400 m to the north of the Site), series of tributaries located approx. 15 m south of the Site and pond located approx. 30 m east of the Site. Local flora and fauna associated with listed habitats.	Infiltration and surface water run-off	<p>Hazardous liquids stored on the Site will be stored within bunded containers.</p> <p>The integrity of bunded containers is inspected as part of the maintenance programme.</p> <p>Spill modelling has been undertaken which has identified areas requiring secondary containment and impermeable surfacing to mitigate the risk of liquids leaving the site boundary in the event of a catastrophic failure, in accordance with CIRIA 736. The Secondary Containment Assessment contains spill modelling and proposed containment solution (Appendix 16). Further details are included in the Improvement Plan.</p>	Negligible	Mild	Low

Table 3.6 Emissions to Air

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?
<p>Uncontrolled Air Emissions as a result of a leak / plant malfunction (including explosions)</p> <p>Failure of abatement systems</p> <p>Failure of CHP and flare stacks</p>	<p>Staff on site, land uses in the vicinity of the site, atmosphere.</p>	<p>Air (Atmospheric Migration)</p>	<p>There is a potential of explosion with plant and equipment involved in the management of biogas. A DSEAR assessment has been completed for site and only appropriate ATEX rated equipment may be used in high-risk areas.</p> <p>The Leak Detection and Repair (LDAR) Plan (Appendix 21) includes information on preventing and detecting gaseous leaks.</p> <p>All plant and equipment on the site are inspected, calibrated and maintained in line with manufacturer or design guidelines as part of a maintenance programme. Alarms will trigger as part of a continuous monitoring system for all plant, which will ensure prompt response to faults involving biogas. The maintenance programme incorporates requirements from the LDAR plan.</p> <p>All plant and equipment on the Site are fitted with process monitoring equipment, which will continuously monitor the process to detect any faults as part of proactive maintenance. This system will raise an alarm if a fault has, or is likely to, occur.</p> <p>Any incidents will be managed in accordance with the Environmental Accident Management Plan (Appendix 13) Incidents will be recorded, and actions taken to resolve. The EA is notified in the event of an incident, in accordance with the Environmental Permit.</p>	<p>Low</p>	<p>Severe</p>	<p>Medium</p>

			Contingency measures will be put in place, as appropriate, to ensure continuity in the treatment process and/or to reduce risk by stopping certain plant/processes. Details are included in the SWW Contingency Plan.			
--	--	--	---	--	--	--

4. REFERENCES

Environment Agency. (2011). *Horizontal Guidance Note H1: Overview Document. H1 Annex A - Amenity & accident risk from installations and waste activities.*

Environment Agency. (2020, December). *Risk assessments for your environmental permit.* Retrieved from <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit>