Local Operating Procedure (LOP)

Site	Monkmoor Sewage Treatment Works
Title	Accident and Incident Management Plan

Purpose	In accordance with condition 1.1 of Environmental Permit EPR/RP3799CW for Monkmoor Sewage Treatment Works, held by Severn Trent Water Ltd, there is a requirement to implement and maintain an Accident Management Plan and an Incident Response Plan. The following accident management plan has been written in accordance with the Environment Agency guidance on Develop a management system: Environmental Permits and H1 Environmental Risk Assessment Principles. An Incident Response Plan is necessary since Severn Trent sites have the potential to cause significant environmental harm. The Incident Response Plan has been consolidated with the accident management plan for the convenience of the user. Not all risks can be eliminated through the Accident Management Plan, so the Incident Response Plan has been added in order to direct Customer Operations, Local Resilience Forums, and other emergency responders to information on the local residual risks. This plan should enable Severn Trent employees to: • Clearly understand who needs to be contacted during an emergency; • Identify possible risks to the environment that are present on site; and • Identify other sources of information that are available regarding risks to the environment.
Who	All members of staff at Monkmoor STW.

Must Have (H&S, Quality, Quantity, Environment, Training, Resources)
N/A
Remember – 'Stop, Think, Take 20'

Summary Must Do
This document must be updated if the following changes are identified: 1. Addition or loss of a risk; 2. Change in mitigation strategies; 3. Change in likelihood of exposure; 4. Change in consequence; 5. Change in contact details; or 6. Change in incident response.

1 Emergency Contacts

Following an assessment of the severity and nature of an incident, site management may trigger the Strategic Incident Management Plan which provides additional resources to manage an incident.

For any other queries, please refer to the Security Team below:

Resilience Specialist, Security and Resilience Team - DETAILS REDACTED FOR EA ISSUE

Security and Resilience Lead - DETAILS REDACTED FOR EA ISSUE

See Table 1.1 for the internal and external contact numbers for Monkmoor STW.

Table 1.1 - Internal and External Finham Contact Numbers

External Contacts		
Contact	Office Hours Number	Out of Hours Number
Emergency Services (Fire/Police/Ambulance)	112 (Call 888 From STW landlines)	112 (Call 888 From STW landlines)
Local Police - Monkmoor	0300 333 3000	101 (non-emergency)
Police anti-terrorist hotline	0800 789 321	0800 789 321
Local Hospital/NHS trust – Royal Shrewsbury Hospital	0174 326 1000	0174 326 1000
Environmental Regulator Incident Hotline	0800 80 70 60 (24 hour service)	0800 80 70 60 (24 hour service)
Environmental Regulator Local Contact – Shrewsbury office	0370 850 6506	0800 80 70 60 (24 hour service)
Local Authority Emergency Planning Dept – Shropshire Council	0345 678 9000	0345 678 9000 01562 733178 (emergency)
Floodline	0345 988 1188	0345 988 1188
Energy Company – Western Power	0800 678 105	Emergency: 105
Highways Agency	0300 123 5000	0300 123 5000
Canal & River Trust	Serious Pollution: 0800 479 9947* Incident Reporting: 0303 040 4040	0303 040 4040
Network Rail	0845 711 4141	British Transport Police: 0800 40 50 40
Waste Management Contractor		
Specialist Clean Up Contractor		
Asbestos Management Contractor		
Internal Contacts		
STW Manager	DETAILS REDACTED FOR EA ISSUE	
STW Senior Technician		
WWR Business Lead East		
Managing Director		
Environmental Permit Team Lead		
Environment, Regs & Permits Business Lead		
Health & Safety Manager		
Bioresources Area Manager		
Bioresources Business lead		
Fire Warden		

* Emergency services to be contacted first.

2 Site Permit Background

2.1 Location

The site is located approximately 3 km east-northeast of the centre of Shrewsbury at address Monkmoor Lane, Monkmoor, Shrewsbury, Shropshire, SY2 5TL; National Grid Reference SJ 51718 13640. The What3Words reference for the entrance of the site ///wipes.trader.marked.

2.2 Operations

The sewage works receives domestic sewage and trade effluent from local industries via the public sewerage system. The site also accepts Tankered Trade Waste, Tankered Domestic Waste and interworks sludge. The permitted wastes are restricted to nonhazardous sludges that fall under waste in liquid form and wastewater as described in the Urban Wastewater Treatment Directive (UWWTD).

Wastes are treated aerobically via the Urban Wastewater treatment route (either on this site or prior to import from satellite sites), then treated through anaerobic digesters. The activities at the works also include the combustion of waste gases in one Combined Heat and Power (CHP) unit.

The activities covered by the environmental permit can be found in Schedule 1 of the permit.

3 Identification of Hazards and Consequent Risk

3.1 Vulnerability of Site to Contamination

A summary of environmental receptors in the vicinity of the site is detailed in Table 3.1. Receptors' sensitivity has been used to assess the level of mitigation required in Appendix A: Accident Management Risk Table in order to maintain a low likelihood of exposure.

Table 3.1 – Local Receptors and Sensitivity

Receptor Type	Receptor(s)	Sensitivity	Reasoning
Groundwater	Superficial Secondary A Aquifer Bedrock Secondary A Aquifer	Moderate	The site is underlain by Secondary A Aquifer deposits with limited overlying protection to infiltration. No data is available on nearby groundwater abstractions and the site is not located within a Groundwater SPZ.
Surface Water	River Severn	High	The River Severn flows around three sides of the site and is located within 200m of the site boundary at its closest point. The river has a Moderate Ecological Status and Fail Chemical Status.
Ecological	Rea Brook Valley LNR Old River Bed, Shrewsbury SSSI Ancient woodland Midland Meres & Mosses Phase 2 Ramsar	Low	There are no ecologically sensitie designations within 500m of the site or otherwise hydrologically linked.
Local Population	Residential and industrial areas	Moderate	The site is bounded to the west by a large residential area and the Monkmoor Industrial Estate; to the north by agricultural fields, a small industrial park and Monkmoor Road; to the east by agricultural fields and the A49; and to the south by agricultural fields and residential area.

3.2 Accident Risk Assessment

The methodology employed for the accident risk assessment is based on the H1 methodology and the results are included below in Appendix A: Accident Management Risk Table. This provides an environmental risk assessment of the worst-case accidents. There are a considerable number of safeguards against such events described in the risk mitigation column.

The hazards within works that could potentially result in an adverse effect on the environment have been identified. It should be noted that the initiator for the events has not necessarily been identified. For example for a fire, the specific source of ignition has not always been considered, rather a general assessment of the likelihood of the event.

The descriptors associated with each ranking are listed below and outlined in Appendix A: Accident Management Risk Table, giving a resulting level of likelihood (L) and consequence (C) of a hazard:

1. Contact with machinery
2. Major vehicle accident leading to significant loss of fuel oil, coolant or engine oil, or transported product
3. Significant loss of fuel, oil, chemicals, materials during a delivery – through overfill, delivery line rupture etc.
4. Misconnection of tanker offloading hoses
5. Damage to tank (accidental rupture, vehicle impact, failure or vandalism) leading to significant inventory loss

6. Failure of storage tank, pipe rupture (raw materials, chemicals, fuels, product)
7. Spillage/leak of chemicals, fuel/oil, sludge etc during handling/transfer
8. Spillage of sludge during transfer / handling activities
9. Failure of sludge storage tanks / digester tanks e.g. tank overtopping, pipework leaks
10. Failure of underground pipework (e.g. fuel, chemicals, sludge, site drains)
11. Build-up of H_2S in confined space
12. Significant leak of biogas following failure of containment of digester or gas holder
13. Failure of flare leading to a build-up of biogas and possible fire / explosion
14. Failure of dewatering activities leading to deposit on cake pad or escape from building of sludge with lower than normal dry solid content
15. Major fire - Air pollution, smoke, odour
16. Minor fire - Air pollution, smoke, odour
17. Failure to contain fire water
18. Vandalism
19. Flooding from rivers / stream / canal / groundwater
20. Flooding due to drain blockages and/or excessive rainfall causing localised on site surface water flooding
21. Excessive odour generation from sludge processing operations, digesters
22. Failure of Bearing/pump/ machinery etc leading to excessive noise
23. Equipment breakdown
24. Enforced shutdown
25. Bad weather (heat, cold, wind)
26. Plane crash
27. Terrorist event
28. Loss of electrical power to the installation, leading to loss of pumps, control systems
29. Gas leak from PRV (Whessoe valve) or pipework failure
30. Failure of secondary/tertiary containment
31. Contractor activities
32. Unidentified container contents
33. Any air emission, but principally NOx.

In order to evaluate the resultant risks posed by the site, a risk assessment matrix has been used. By reading down the rows to the appropriate likelihood level of a hazard, then across the columns to intersect with the appropriate consequence (C) level, the overall assessment of the hazard is identified. The STW Accident and Incident Management Plan SOP describes the basis on how this risk is assessed and identifies how levels are interpreted.

4 Conclusions of the Accident Risk Assessment

The sensitivity of this site is high with regard to proximity to groundwater and surface water elements. Due to the contained nature of the works and a considerable number of mitigating measures (both management and physical), the accident risk assessment identifies the majority of risks as Low.

One potential risk is assessed as Moderate:

- Damage to tank (accidental rupture, vehicle impact, failure or vandalism) leading to significant inventory loss

This is considered as low probability but high severity. Management techniques have been implemented for both, and as part of a Severn Trent wide review, a number of actions are taking place to further improve the management and containment of AD Sites.

5 Incident Management Plan

The Incident Response Plan has been based on the pollution prevention guidance written by the Environment Agency for Pollution Incident Response Planning (PPG21).

An Incident Response Plan is necessary since Severn Trent sites have the potential to cause significant environmental harm.

The objective of this plan is to be used by Operators, Maintainers, SD Managers etc. in the event of finding a spillage, fire or flood on site. Flow charts for these events can be found in Appendix B: Incident Response Plans. The majority of incidents will be managed at the Operational, Tactical or Coordinating-Tactical level. The Business Leader on duty should determine whether the incident should be managed locally at an Operational or Tactical level. Initial reporting must be within 3 hours of the incident being discovered and continue on a daily basis until its conclusion.

Appendix A: Accident Management Risk Table

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
1. Contact with machinery	Local population or livestock gaining unauthorised access to the installation, and bodily harm	Direct contact	100052 SECURITY STANDARD Risk mitigated by following the security standards. Direct contact is minimised by activity being carried out within enclosed digesters. Banksmen are used when appropriate and vehicles have reversing alarms.	Highly unlikely	Severe	Low as management techniques are used
2. Major vehicle accident leading to significant loss of fuel oil, coolant or engine oil, or transported product	Local water courses, land, groundwater, localised fumes, and bodily injury	Surface water drainage system, infiltration into ground, diffusion into air, and physical contact	100044 WASTE MANAGEMENT STANDARD COSHH REPOSITORY IN WATERPEDIA (See related documents) 100082 MANAGING SUBSTANCES HAZARDOUS TO HEALTH STANDARD 100116 WORKPLACE STANDARDS 100107 TRAFFIC MANAGMENT ON MANNED SITES, DEPOTS AND OFFICES STANDARD 100097 MANAGING CONTRACTORS AND SUPPLIERS STANDARD 100088 FIRE SAFETY STANDARD 200711 WASTE NONINFRA POLLUTION RESPONSE SOP 202325 CHEMICAL SPILL GUIDANCE 204344 EMS SPILL KIT SOP Spill kits are available insitu where chemicals and oil are stored. These will be used to cover drains if necessary to prevent spills returning to the head of the works and remedy the spill.	Highly unlikely	Severe	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
			Road surfaces are impermeable and well maintained. Drainage of wider sewage treatment works contained and directed to the head of the works. Vehicle speed is low due to speed limit restrictions of 10/20 mph currently in place as part of the sites traffic management plan. Vehicles adhere to traffic management plan, and remain on allocated roads, which includes a one way system. Most drivers are familiar with the site – routine deliveries. Road vehicles are very robust and designed to withstand high-speed collisions. Any evidence of sizeable spillage or leakage would be reported to the Site Manager or his deputy for appropriate remedial action. All operators are trained in spillage management STW have a 24hr external response service for emergency clean-up.			
3. Significant loss of fuel, oil, chemicals, materials during a delivery – through overfill, delivery line rupture etc.	Local water courses, land, groundwater. Localised fumes, bodily injury	Surface water drainage system, infiltration into ground, diffusion into air, and physical contact	204720, 204721, 204911, 204722 CHEMICAL DELIVERY SOPs COSHH REPOSITORY ON WATERPEDIA (See related documents) 100044 WASTE MANAGEMENT STANDARD 100082 MANAGING SUBSTANCES HAZARDOUS TO HEALTH STANDARD 100088 FIRE SAFETY STANDARD 100116 WORKPLACE STANDARD 100097 MANAGING CONTRACTORS AND SUPPLIERS STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 202325 CHEMICAL SPILL GUIDANCE SOP 204344 EMS SPILL KIT SOP All polluting materials delivered to site will be unloaded by suitably competent employees from the delivery company and	Likely	Mild	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
			overseen by a designated competent operative. Provision of secondary containment via steel double walled storage tanks or bund where required. Regular inspection of containment. Records of all deliveries are kept. Tanks are checked for capacity before filling. All road tanker on and off loading points are locked to ensure use by authorised personnel only. The fill/dispensing connection point is kept locked to ensure use by authorised personnel only and is within the outer tank, which is bunded. The tanker on and off loading area is concrete hard standing. Any overflow would be contained in bund. If a bund is overwhelmed or a leak occurs outside the bund, drainage of the wider sewage treatment works will contain it. Spill kits are available insitu where chemicals and oil are stored. These will be used to cover drains if necessary to prevent spills retuning to the head of the works and remedy the spill. Any evidence of sizeable spillage or leakage would be reported to the Site Manager or his deputy for appropriate remedial action. All operators are trained in spillage management. STW have a 24hr external response service for emergency clean-up. The fuel oil supply pipe to the boilers is inspected regularly.			

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
4. Misconnection of tanker offloading hoses	Local water courses, land, groundwater, and local population	Overtopping, failure of digestion process	204720, 204721, 204911, 204722 CHEMICAL DELIVERY SOPs COSHH REPOSITORY ON WATERPEDIA (See related documents) 100044 WASTE MANAGEMENT STANDARD 100082 MANAGING SUBSTANCES HAZARDOUS TO HEALTH STANDARD 100088 FIRE SAFETY STANDARD 100116 WORKPLACE STANDARD 100097 MANAGING CONTRACTORS AND SUPPLIERS STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 202325 CHEMICAL SPILL GUIDANCE SOP 204344 EMS SPILL KIT SOP Pre-acceptance and acceptance testing. Dedicated hoses are provided on-site to be used by the tankers to mitigate against misconnection. All polluting materials delivered to site will be unloaded by suitably competent employees from the delivery company and overseen by a designated competent operative. Provision of secondary containment via double walled storage tanks or bund where required. Regular visual inspection of containment. Records of all deliveries are kept. Tanks are checked for capacity before filling. All road tanker on and off loading points are locked to ensure use by authorised personnel only. The fill/dispensing connection point is kept locked and is within the outer tank. The tanker on and off loading area is concrete hard standing. If a tank was overwhelmed or leak occurs outside of a bund the	Low likelihood	Medium	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
			drainage of the wider sewage treatment works is contained. Spill kits are available insitu where chemicals and oil are stored. These will be used to cover drains if necessary to prevent spills retuning to the head of the works and remedy the spill. Any evidence of sizeable spillage or leakage would be reported to the Site Manager or his deputy for appropriate remedial action. All operators are trained in spillage management. STW have a 24hr external response service for emergency clean-up.			
5. Damage to tank (accidental rupture, vehicle impact, failure or vandalism) leading to significant inventory loss	Local water courses, land, and groundwater.	Surface water drainage system, and infiltration into ground.	204720, 204721, 204722, 204911 CHEMICAL DELIVERY SOP COSHH REPOSITORY ON WATERPEDIA (see related documents) 100044 WASTE MANAGEMENT STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 202325 CHEMICAL SPILL GUIDANCE SOP 204344 EMS SPILL KIIT SOP TANK DESIGN STANDARD MANUAL All polluting materials delivered to site will be unloaded by suitably competent employees from the delivery company and overseen by a designated competent operative. Provision of secondary containment via steel double walled storage tanks or bund where required, and physical guards from impact (e.g. bollards, walls). Regular visual inspection of containment. Records of all deliveries are kept. Tanks are checked for capacity before filling. All road tanker on and off loading points are locked to ensure use by authorised personnel only. The fill/dispensing connection point is kept locked and is within the outer tank, which is bunded.	Low likelihood	Severe	Moderate

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
			The tanker on and off loading area is on concrete hard standing. If a tank was overwhelmed or leak occurs outside of a bund the drainage of the wider sewage treatment works is contained. Spill kits are available insitu where chemicals and oil are stored. These will be used to cover drains if necessary to prevent spills returning to the head of the works and remedy the spill. Any evidence of sizeable spillage or leakage would be reported to the Site Manager or his deputy for appropriate remedial action. All operators are trained in spillage management. STW have a 24hr external response service for emergency clean-up.			
6. Failure of storage tank, pipe rupture (raw materials, chemicals, fuels, product)	Local water courses, land, and groundwater.	Surface water drainage system, infiltration into ground.	204720, 204721, 204722, 204911 CHEMICAL DELIVERY SOP COSHH REPOSITORY ON WATERPEDIA (see related documents) 100044 WASTE MANAGEMENT STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 202325 CHEMICAL SPILL GUIDANCE SOP 204344 EMS SPILL KIT SOP TANK DESIGN STANDARD MANUAL Provision of secondary containment via steel double walled storage tanks or bund where required, and physical guards from impact (e.g. bollards, walls). Regular visual inspection of containment. The tank is located on concrete hard standing. If a tank was overwhelmed or leak occurs outside of a bund the drainage of the wider sewage treatment works is contained. Spill kits are available insitu where chemicals and oil are stored. These will be used to cover drains if necessary to prevent spills returning to the head of the works and remedy the spill.	Low likelihood	Medium	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
			Any evidence of sizeable spillage or leakage would be reported to the Site Manager or his deputy for appropriate remedial action. All operators are trained in spillage management. STW have a 24hr external response service for emergency clean-up.			
7. Spillage/leak of chemicals, fuel/oil, sludge etc during handling/transfer	Local water courses, land, and groundwater.	Surface water drainage system, infiltration into ground.	100044 WASTE MANAGEMENT STANDARD COSHH REPOSITORY IN WATERPEDIA (see related documents) 100082 CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH STANDARD 100088 FIRE SAFETY STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 202325 CHEMICAL SPILL GUIDANCE SOP 204344 EMS SPILL KIT SOP Designated hoses are provided on-site to be used by the tankers to mitigate against misconnection. Provision of secondary containment via steel double walled storage tanks or bund where required. Regular visual inspection of containment. If a tank was overwhelmed or leak occurs outside of a bund the drainage of the wider sewage treatment works is contained. Spill kits are available insitu where chemicals and oil are stored. These will be used to cover drains if necessary to prevent spills retuning to the head of the works and remedy the spill. Any evidence of sizeable spillage or leakage would be reported to the Site Manager or his deputy for appropriate remedial action. All operators are trained in spillage management. STW have a 24hr external response service for emergency clean-up. The CHP engine is containerised and self bunded, the unit also	Low likelihood	Medium	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
			has a low pressure sensor on the coolant system. All antifoam is stored within a specialized contained located on spillage containment euqipment. Polymer is stored in IBC's above spillage containment equipment or a self contained unit. All pipe work is dual walled.			
8. Spillage of sludge during transfer / handling activities	Local water courses, land, and groundwater.	Surface water drainage system, infiltration into ground.	100044 WASTE MANAGEMENT STANDARD COSHH REPOSITORY IN WATERPEDIA (see related documents) 100082 CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH STANDARD 100088 FIRE SAFETY STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 202325 CHEMICAL SPILL GUIDANCE SOP 204344 EMS SPILL KIT SOP Provision of secondary containment via steel double walled storage tanks or bund where required. Regular inspection of containment. If a tank was overwhelmed or leak occurs outside of a bund the drainage of the wider sewage treatment works is contained. Spill kits are available insitu where chemicals and oil are stored. These will be used to cover drains if necessary to prevent spills retuning to the head of the works and remedy the spill. Any evidence of sizeable spillage or leakage would be reported to the Site Manager or his deputy for appropriate remedial action. All operators are trained in spillage management. STW have a 24hr external response service for emergency clean-up.	Likely	Minor	Low

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
9. Failure of sludge storage tanks / digester tanks e.g. tank overtopping, pipework leaks	Local water courses, land, and groundwater.	Surface water drainage system, and infiltration into ground.	100044 WASTE MANAGEMENT STANDARD COSHH REPOSITORY IN WATERPEDIA (see related documents) 100082 CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH STANDARD 100088 FIRE SAFETY STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 202325 CHEMICAL SPILL GUIDANCE SOP 204344 EMS SPILL KIT SOP CP0308-10 WASTEWATER DIGESTOR EMERGENCY PROCEDURE CHEMICAL HANDLING AND STORAGE SOP TANK DESIGN STANDARD MANUAL Regular infrastructure inspections including pipework and tanks and planned preventive maintenance system in place. High level alarms on all tanks and digesters. Digester foaming is monitored and anti-foam added as required. If a tank was overwhelmed or leak occurs outside of a bund the drainage of the wider sewage treatment works is contained. Spill kits are available insitu where chemicals and oil are stored. These will be used to cover drains if necessary to prevent spills retuning to the head of the works and remedy the spill. Any evidence of sizeable spillage or leakage would be reported to the Site Manager or his deputy for appropriate remedial action. All operators are trained in spillage management. STW have a 24hr external response service for emergency clean-up.	Low likelihood	Severe	Low

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
10. Failure of underground pipework (e.g. fuel, chemicals, sludge, site drains)	Ground and groundwater	Infiltration / percolation through ground	100044 WASTE MANAGEMENT STANDARD COSHH REPOSITORY IN WATERPEDIA (see related documents) 100082 CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH STANDARD 100088 FIRE SAFETY STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 202325 CHEMICAL SPILL GUIDANCE SOP 204344 EMS SPILL KIT SOP Regular infrastructure inspections including visible pipework and tanks and planned preventive maintenance system in place. Any evidence of leakage would be reported to the Site Manager or his deputy for appropriate remedial action. The drainage of the wider sewage treatment works is contained. Spill kits are available insitu where chemicals and oil are stored. These will be used to cover drains if necessary to prevent spills retuning to the head of the works and remedy the spill. All operators are trained in spillage management. STW have a 24hr external response service for emergency clean-up.	Low likelihood	Medium	Low as management techniques are used
11. Build up of H_2S in confined space	Local population, staff, emergency workers, ecological receptors	Windblown dispersion.	100247 ABOVE GROUND HYDROGEN SULPHIDE STANDARD 100104 PPE 100121 DSEAR Staff are trained to carry out risk assessment prior to the entry of potentially hazardous spaces. Staff are provided with and trained in the use of personal gas monitors. Gas monitors carried by staff accessing risk areas and/or monitors located in risk areas.	Low likelihood	Severe	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
			There is a regular calibration program for gas monitors. Continuous process monitoring to identify abnormal conditions that could result in build up of H_2S. Repair and maintenance teams on 24hr standby.			
12. Significant leak of biogas following failure of containment of digester or gas holder	Local population, contribution to global warming	Windblown dispersion.	100121 DSEAR 100088 FIRE SAFETY 204717 Digester Emergency Alarms Guide Guarding of exposed pipework. Regular maintenance inspections. Pressure is monitored 24/7 by operations control centre. Any alarms initiated are actioned immediately. Treat gas through flare if possible. Inform EA and emergency services. Invoke site emergency plan.	Highly unlikely	Severe	Low as management techniques are used
13. Failure of flare leading to a build up of biogas and possible fire / explosion	Local population, respiratory irritation, illness and nuisance, injury to emergency works, staff, arsonist, land, and ground water	Windblown dispersion. Spillages and direct run off from site and from drainage system	100121 DSEAR 100088 FIRE SAFETY STANDARD 100102 OFFICE SAFETY STANDARD COSHH RESPOSITORY ON WATERPEDIA (see related documents) 100097 MANAGING SUBSTANCES HAZARDOUS TO HEALTH STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 100162 ISOLATION OF ENERGY AND EQUIPMENT Management systems required to include DSEAR assessment. HAZOP undertaken on plant both at initial design and revised for the biogas upgrade plant. The engine feed is fitted with a slam shut valve, which is activated	Highly unlikely	Severe	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
			by gas and temperature sensors in the engine container. The container also has forced air ventilation to prevent the formation of an explosive atmosphere. Fire alarm systems installed and maintained. Automatic cut off valve to biogas supply using a fusable link, electric temperature sensor, flame arrestors, etc. All employees will undergo training relevant to their role in fire prevention, use of fire extinguishers and emergency procedures. There are named Fire Wardens. All sites are non-smoking. Smoking is only permitted in designated areas. A formal permit to work system will be in place to ensure appropriate precautions are taken and approval obtained. Pressure release valves automatically operate to reduce pressure. Lightening rod installed Follow site Incident Response Plan and inform relevant authorities.			
14. Failure of dewatering activities leading to deposit on cake pad or escape from building of sludge with lower than normal dry solid content	Local water courses, land and groundwater.	Surface water drainage system., infiltration into ground.	Return to de-watering process or tanker off site for treatment at an alternative location. Repair and maintenance teams on 24hr standby. Scheduled inspection, repair and maintenance tasks, with a central tracking system for completion and escalation. Remote alarm systems. Secondary and tertiary containment in case of loss of containment. Drainage of wider sewage treatment works contained and directed to the head of the works.	Low likelihood	Medium	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
15. Major fire - Air pollution, smoke, odour	Local population, respiratory irritation, illness and nuisance, injury to emergency workers, staff, arsonists, land, and ground water	Windblown dispersion, spillages and direct run off from site and from drainage system	100088 FIRE SAFETY STANDARD 100102 OFFICE SAFETY STANDARD COSHH RESPOSITORY ON WATERPEDIA (see related documents) 100097 MANAGING SUBSTANCES HAZARDOUS TO HEALTH STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 100162 ISOLATION OF ENERGY AND EQUIPMENT The engine feed is fitted with a slam shut valve, which is activated by gas and temperature sensors in the engine container. The container also has forced air ventilation to prevent the formation of an explosive atmosphere. Fire alarm systems installed and maintained. Automatic cut off valve to biogas supply using a fusable link, electric temperature sensor, flame arrestors, etc All employees will undergo training relevant to their role in fire prevention, use of fire extinguishers and emergency procedures. There are named Fire Wardens. All sites are non-smoking. Smoking is only permitted in designated areas. A formal permit to work system will be in place to ensure appropriate precautions are taken and approval obtained.	Highly Unlikely	Severe	Low as management techniques are used
16. Minor fire - Air pollution, smoke, odour	Local population, respiratory irritation, illness and nuisance,	Windblown dispersion, spillages and direct run off from site and from	100088 FIRE SAFETY STANDARD 100102 OFFICE SAFETY STANDARD COSHH RESPOSITORY ON WATERPEDIA (see related documents) 100097 MANAGING SUBSTANCES HAZARDOUS TO HEALTH STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP	Highly Unlikely	Medium	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
	injury to emergency workers, staff, arsonists, land, and ground water	drainage system	100162 MANAGING CONTRACTORS AND SUPPLIER The engine feed is fitted with a slam shut valve, which is activated by gas and temperature sensors in the engine container. The container also has forced air ventilation to prevent the formation of an explosive atmosphere. Fire alarm systems installed and maintained. Automatic cut off valve to biogas supply using a fusable link, electric temperature sensor, flame arrestors, etc. All employees will undergo training relevant to their role in fire prevention, use of fire extinguishers and emergency procedures. There are named Fire Wardens. All sites are non-smoking. Smoking is only permitted in designated areas. A formal permit to work system will be in place to ensure appropriate precautions are taken and approval obtained for contractors.			

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
17. Failure to contain fire water	Local water courses, land and groundwater.	Surface water drainage system, and infiltration into ground.	100088 FIRE SAFETY STANDARD 100102 OFFICE SAFETY STANDARD COSHH RESPOSITORY ON WATERPEDIA (see related documents) 100097 MANAGING SUBSTANCES HAZARDOUS TO HEALTH STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 100162 ISOLATION OF ENERGY AND EQUIPMENT SITE DRAINAGE PLAN Fire prevention measures as above. Drainage of wider sewage treatment works contained and directed to the head of the works. Manholes to any surface water drains within site are usually designed out. Site drainage plan identifies any remaining at-risk points that lead to surface water.	Highly unlikely	Medium	Low as management techniques are used
18. Vandalism	Local population. Ecological receptors. Local water courses, land and groundwater.	Windblown dispersion. Surface water drainage system, and infiltration into ground.	100052 SITE SECURITY STANDARD Site security measures are in place including perimeter fence with controlled access gates. Regular inspection of perimeter fences. Site permanently manned. The specific consequences of vandalism (fire, spillage etc) are dealt with above.	Low likelihood	Medium	Low as management techniques are used
19. Flooding from rivers / stream / canal / groundwater	Local water courses, land and groundwater.	Surface water drainage system, and	305933 FLOOD EMERGENCY RESPONSE PLAN The majority of the site lies within flood zone 1, defined as having a low probability of flooding (Ref. 5). However, the north eastern corner of site, whereby the ASPs and FSTs are located, is situated	Low likelihood	Mild	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
		infiltration into ground.	in flood zones 2 defined as having a medium probability of flooding. General wider works designed to minimize risk of localized works flooding due to storm surges. Inform the EA following any incidents. Take appropriate corrective and preventative actions to minimize environmental impact. If the installation is in imminent danger of flooding or a flood alert has been issued, all electrical supplies in the affected area will be isolated. If possible, all stocks of fuel will be removed from the area at risk. Personnel will not attempt to enter a flooded area until a risk assessment has been undertaken or the flood has subsided. Personnel will follow instructions issued by supervisors, managers or other competent persons. Samples of floodwater will be obtained to determine whether it is contaminated. If the floodwater is not contaminated, it will be pumped to surface water. If contamination is shown to be present, the Environment Agency will be consulted before removal. Following remedial action to clear the flood water, an approved contractor will check all affected electrical supplies.			
20. Flooding due to drain blockages and/or excessive rainfall causing localised on site	Local water courses, land and groundwater.	Surface water drainage system, and infiltration into ground.	10052 SITE STANDARDS Regular checks including drains and hardstanding. Spill response material including booms available to manage water. If the installation is in imminent danger of flooding or a flood	Likely	Minor	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
surface water flooding			alert has been issued, all electrical supplies in the affected area will be isolated. If possible all stocks of fuel will be removed from the area at risk. Personnel will not attempt to enter a flooded area until a risk assessment has been undertaken or the flood has subsided. Personnel will follow instructions issued by supervisors, managers or other competent persons. Samples of floodwater will be obtained to determine whether it is contaminated. If the floodwater is not contaminated, it will be pumped to surface water. If contamination is shown to be present, the Environment Agency will be consulted before removal. Following remedial action to clear the flood water, an approved contractor will check all affected electrical supplies.			
21. Excessive odour generation from sludge processing operations , digesters	Local population	*Residential housing located along the site border.* Windblown dispersion. Loss of amenity	100269 ASSET STANDARD ODOUR TREATMENT & CONTROL PLANTS SITE ODOUR MANAGEMENT PLAN (If available) All odorous materials are stored in enclosed systems where possible. Odour control units are used in key locations. Complaints handing process. Preventative maintenance programme and cleaning regime. Identify source of odour. In the event of a fault take corrective action. Review as appropriate. Waste acceptance procedures in place.	Low likelihood	Mild	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
22. Failure of Bearing/pump/ machinery etc leading to excessive noise	Local population	*Residential houses are located close to the site boundary.* Air dispersion	Complaints handing process. Repair and maintenance teams on 24hr standby. Planned preventative maintenance in place.	Low likelihood	Mild	Low as management techniques are used
23. Equipment breakdown	Local water courses, land and groundwater. Air emissions	Surface water drainage system, and infiltration into ground.	Repair and maintenance teams on 24hr standby. Scheduled inspection, repair and maintenance tasks, with a central tracking system for completion and escalation. Remote alarm systems. Secondary and tertiary containment in case of loss of containment. Start-up/shutdown procedures. Control of contractors. The specific consequences of equipment breakdown (fire, spillage etc) are dealt with above.	Low likelihood	Medium	Low as management techniques are used
24. Enforced shutdown	Local water courses, land and groundwater.	Surface water drainage system, and infiltration into ground.	Repair and maintenance teams on 24hr standby. Scheduled inspection, repair and maintenance tasks, with a central tracking system for completion and escalation. Remote alarm systems. Secondary and tertiary containment in case of loss of containment. Start-up/shutdown procedures. Control of contractors.	Highly Unlikely	Medium	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
25. Bad weather (heat, cold, wind)	Local water courses, land and groundwater.	Surface water drainage system, and infiltration into ground.	Repair and maintenance teams on 24hr standby. Scheduled inspection, repair and maintenance tasks, with a central tracking system for completion and escalation. Remote alarm systems. Secondary and tertiary containment in case of loss of containment. Start-up/shutdown procedures.	Likely	Minor	Low as management techniques are used
26. Plane crash	Local water courses, land, groundwater, and local population	Surface water drainage system, and infiltration into ground, and windbourne.	200711 WASTE NONINFRA POLLUTION RESPONSE SOP 100088 FIRE SAFETY STANDARD 100089 FIRST AID AT WORK STANDARD Emergency services and management would be contacted. Staff would follow emergency services and management guidance if an event were to occur.	Highly Unlikely	Severe	Low as management techniques are used
27. Terrorist event	Local water courses, land, groundwater, and local population	Surface water drainage system, and infiltration into ground, and windbourne.	100052 SECURITY STANDARD 100088 FIRE SAFETY STANDARD 100089 FIRST AID AT WORK STANDARD Security is maintained throughout the site minimising unauthorised access to the site, chemicals and assets. Staff would notify management of anything suspicious, the emergency services would be contacted. Staff would follow management guidance and emergency services if an event were to occur.	Highly Unlikely	Severe	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
28. Loss of electrical power to the installation, leading to loss of pumps, control systems	Local water courses, land, and groundwater.	Surface water drainage system, and infiltration into ground.	100088 FIRE SAFETY STANDARD 200711 WASTE NONINFRA POLLUTION RESPONSE SOP 100097 MANAGING CONTRACTORS AND SUPPLIERS STANDARD CHP engine produces power for the site so nothing will be switched off. Repair and maintenance teams on 24hr standby. Failsafe systems in place to ensure that sludge remains insitu. Scheduled inspection, repair and maintenance tasks, with a central tracking system for completion and escalation. Remote alarm systems. Secondary and tertiary containment in case of loss of containment . Start-up/shutdown procedure. Back up power/contingency plans are in place to provide power to critical operations in the event of an electrical outage.	Low likelihood	Medium	Low as management techniques are used
29. Gas leak from PRV (Whessoe valve) or pipework failure	Local population	Air dispersion	Instrumentation to measure gas pressure linked to telemetry alarms and will generate a site visit and investigation (including out of hours). The CHP engine also has hi and low gas pressure trips. Whessoe valves (pressure relief) are routinely inspected and records kept centrally. There is a regular inspection schedule for digesters by competent persons – records are kept of this.	Low likelihood	Medium	Low as management techniques are used

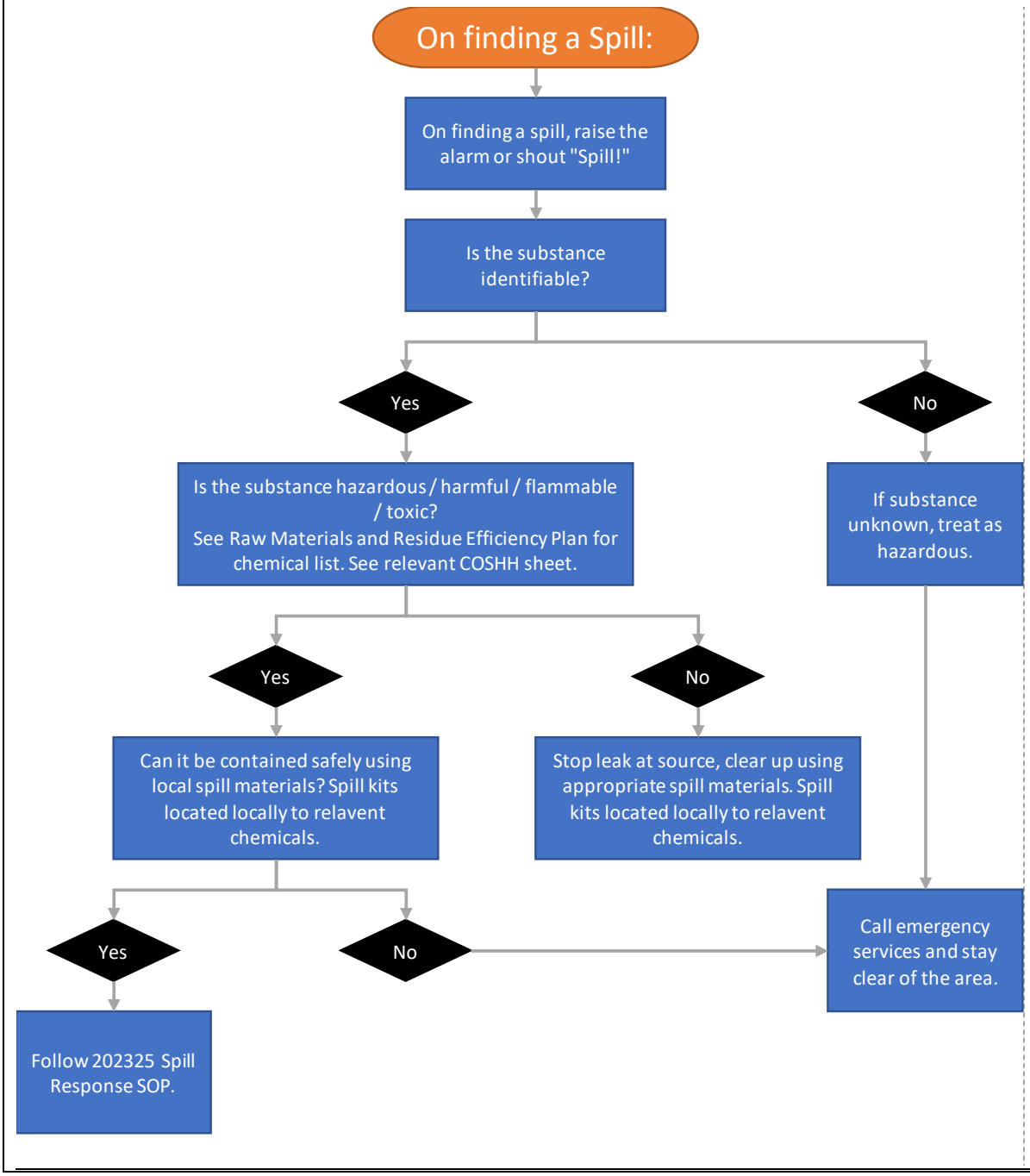
			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
30. Failure of secondary/tertiary containment	Local water courses, land and groundwater.	Surface water drainage system, infiltration into ground, and windblown dispersion	100044 WASTE MANAGEMENT STANDARD COSHH REPOSITORY IN WATERPEDIA (see related documents) 100097 MANAGING SUBSTANCES HAZARDOUS TO HEALTH STANDARD 100116 WORKPLACE STANDARDS 100107 TRAFFIC MANAGMEENT ON MANNED SITES, DEPOTS AND OFFICES STANDARD 100097 MANAGING CONTRACTORS AND SUPPLIERS STANDARD 100088 FIRE SAFETY STANDARD 200711 WASTE NONINFRA POLLUTION RESPONSE SOP 202325 CHEMICAL SPILL GUIDANCE 204344 EMS SPILL KIT SOP Fill and dispensing points are kept locked. Regular inspections take place, with a centrally run system for repairs and escalation. Remote alarm systems in place. Tanks are located on concrete hard standing with adjacent areas either tarmac or concrete hard standing, which is kept in good conditions. Drainage of wider sewage treatment works contained and directed to the head of the works. Any evidence of sizeable spillage or leakage would be reported to the Site Manager or his deputy for appropriate remedial action. All operators are trained in spillage management and spill kits are available on site. STW have a 24hr external response service for emergency clean-up.	Highly Unlikely	Severe	Low as management techniques are used

			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual 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?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
31. Contractor activities	Local water courses, land, groundwater, and localised air pollution	Surface water drainage syste, and infiltration into ground.	100097 MANAGING CONTRACTORS AND SUPPLIER Approved Suppliers List. All contractor work activities are covered by: Risk assessments, Method statements, authorisations to work.	Low likelihood	Mild	Low
32. Unidentified container contents	Local water courses, land, and groundwater.	Surface water drainage syste, and infiltration into ground.	100052 SITE STANDARDS 100044 WASTE MANAGEMENT STANDARD COSHH REPOSITORY IN WATERPEDIA (see related documents) 100082 MANAGING SUBSTANCES HAZARDOUS TO HEALTH STANDARD 100088 FIRE SAFETY STANDARD 200711 NON INFRA POLLUTION RESPONSE SOP 202325 CHEMICAL SPILL GUIDANCE SOP 204344 EMS SPILL KIIT SOP In an event a tank contains a substance which is unknown, seek to identify what the substance is. If possible, remove the substance from the site to an appropriately permitted hazardous waste facility. Regular visual inspection of containment. If a bund was overwhelmed or leak occurs outside of bund the drainage of the wider sewage treatment works contained and directed to the head of the works. Any evidence of spillage or leakage would be reported to the Site Manager or his deputy for appropriate remedial action. All operators are trained in spillage management and spill kits are	Low likelihood	Medium	Low as management techniques are used

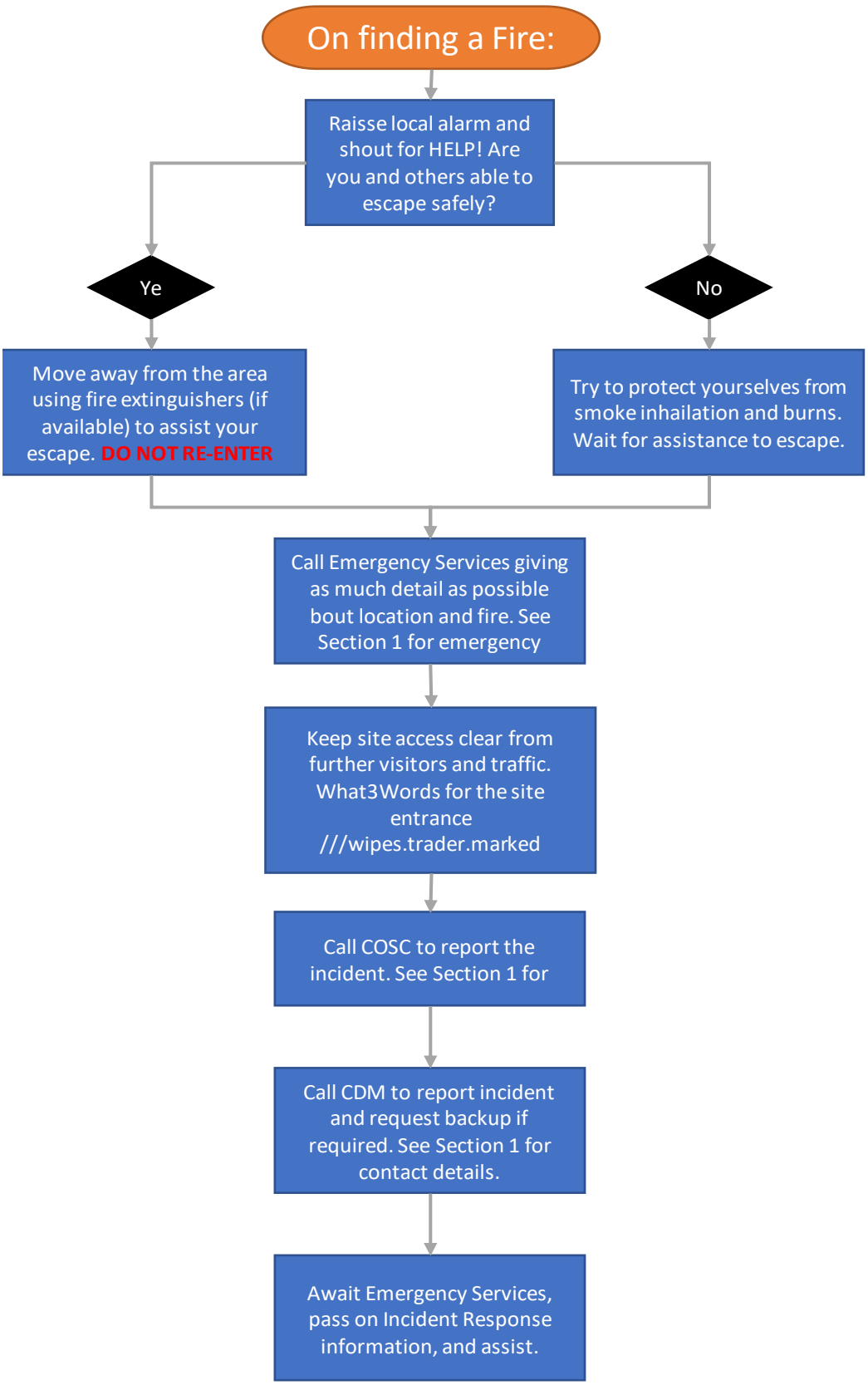
			Managing the risk	Assessing the risk		
Source	Receptor	Pathway	Controls	Likelihood of exposure	Consequence	What is the residual risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	Risk Mitigation	How probable is this contact?	What is the harm that can be caused?	What is the risk that still remains?
			available on site. STW have a 24hr external response service for emergency clean-up.			
33. Any air emission, but principally NOx.	Local protected nature reserves.	Air transport.	The site operates within the emission limit specified within the current permit. Infrastructure is designed to minimise uncontrolled releases. Checks, monitoring and preventative maintenance. Emissions modelling shows deposition and impacts on habitat sites are acceptable.	Unlikely to Low	Medium	Low as management techniques used.

Appendix B: Incident Response Plans

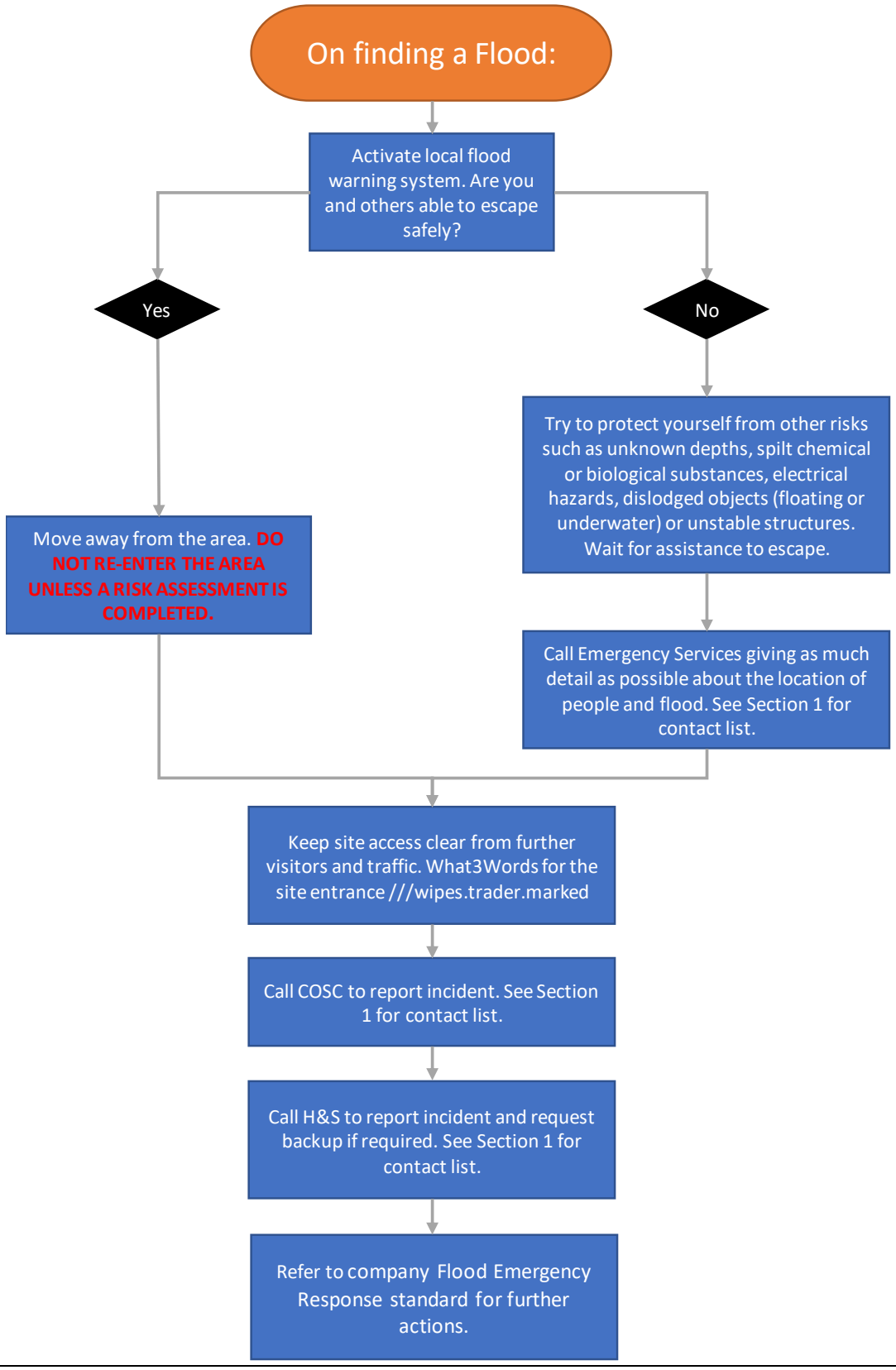
Spill Response Plan



Fire Response Plan



Flood Response Plan



Records, Appendices & References

The following documents can be used in conjunction with this Accident and Incident Management Plan:

- Site Infrastructure Plan
- 305939 Flood Emergency Response Plan
- 10451 Fire Risk Assessment
- DSEAR Risk Assessment (See related links on Waterpedia)
- Schedule 5 (See associated links on Waterpedia)100088 Fire Safety Standard
- SR0102-05 Strategic Incident Management Response Plan

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Version	Date	Reviewers names	Approvers names	Reason for Review	Supported doc changes	Communications
1.0	21/04/2022			Document creation		
2.0						

Summary of changes	
1.0	Document creation
2.0	

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