

# WARD

## CLIMATE CHANGE RISKS & ADAPTATIONS

### CONTENTS

1	SUMMER DAILY MAXIMUM TEMPERATURE .....	4
2	WINTER DAILY TEMPERATURES .....	8
3	DAILY EXTREME RAINFALL .....	10
4	AVERAGE WINTER RAINFALL .....	12
5	SEA LEVEL RISE .....	13
6	DRIER SUMMERS .....	15
7	RIVER FLOW .....	17
8	STORMS .....	19
9	OTHER .....	21
10	REFERENCES .....	24

# SITE CLASSIFICATIONS

This covers the different types of operations that occur across the UK sites. Some sites may be a combination.

- Shredder
- Cable Granulation
- Corporate
- Dock
- Feeder
- Fridges/ ELV/ WEEE
- Shearing/ Ferrous (FE) Cut
- Non-Ferrous (NF) Hub/ Processing
- Offline Recovery Plant (OLRP) including but not restricted to
  - ASR (automotive shredder residue)
  - NFR (non-ferrous residue)
  - Incinerator scrap
- Wood Recycling
- Compaction / Municipal Waste Recovery [MRF]

This covers the different type of locations which are most at risk for impact due to climate change. This list is not exhaustive.

- Coastal
- Tidal
- Industrial
- Flood Plain
- Nature interests nearby

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 2 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

## PURPOSE OF DOCUMENT

This document outlines climate changes and associated risks considered to affect Donald Ward Limited. This document supports individual site-specific risk assessments and adaptation plans and objectives.

A Climate Change Risk and Adaptations Plan allows businesses to consider relevant impacts on site, and to share lessons learned from international operations, which may face different or more extreme weather. It also allows businesses to consider timescales of actions, as severity of climate change is likely to increase with time.

## SITE-BASED IMPACTS

- Consider how vulnerable your site is to current and future climates.
- Consider risks based on a four °C rise by 2100.
- Consider adaptation plans for a two °C rise by 2050.

Find any site-specific issues. For example:

- access issues due to flooding or sea-level rise
- distance from areas where wildfires could break out.
- risks from failure of essential site services (water, electrical supply, drainage systems)

Research local significant receptors (people, animals, property). Examples are:

- Sites of Special Scientific Interest
- Watercourses
- Local nature reserves or endangered species

Consider if their vulnerability to emissions or incidents increases with changing weather patterns. Consider if this creates a risk for your permit compliance.

You can get basic climate change impact data from the Environment Agency's [climate impacts tool](#). You can get more detailed analysis of the risks from the Environment Agency's [third climate change adaptation report](#).

To develop a [more detailed assessment](#) you can follow:

- ISO 14090:2019 on adaptation
- ISO 14091:2021 on vulnerability, impacts and risk assessment.

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 3 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

# 1 SUMMER DAILY MAXIMUM TEMPERATURE

Average summer temperature could reach 7 °C higher compared to average summer temperatures now, with the potential to reach extreme temperatures of over 40 °C with increasing frequency based on today's values. (Environment Agency, 2023). <https://uk-cri.org/> informs site specific temperature projections.

## 1.1 POTENTIAL FOR INCREASED WASTE REACTIONS AND FIRES

Potential for increased waste reactions and fires involving certain combustible or reactive waste types. The potential for risk may occur if wastes are exposed to extreme temperatures. Materials considered for potential waste reactions and/or fires include, but are not limited to, the following.

- Batteries/ Small mixed WEEE
- heat sensitive or combustible waste oil, contaminated swarf, or oily rags.
- frag light fractions or other combustible wastes

The mitigation for this could include:

- making sure heat sensitive combustible wastes (oily rags and batteries) are stored away from direct sunlight (for example, in buildings or under cover)
- making sure combustible waste oils are stored in appropriate designated tanks or containers.
- waste acceptance and inspection procedures to identify & segregate non-conforming combustible wastes.
- making sure there is suitable segregation and separation of wastes.
- regular monitoring of waste stockpiles to ensure they are not self-heating.
- the fire prevention plan considers increased risk over time with focus on increased risk from self-heating and combustion due to extreme heat.
- having a fire prevention plan that details the above, and any wastes that are incompatible or unstable.

Interdependency: reduced water availability, prolonged heat, intense heat, prolonged dry conditions, rainfall impact on batteries, increased sunlight hours, UV

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 4 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

## 1.2 POTENTIAL FOR FIRE DUE TO DRY VEGETATION NEAR HOT CUTTING AREAS OR OTHER COMBUSTIBLES

Daily summer temperature predicted around 7 °C higher, with the potential to reach extreme temperatures of over 40 °C with increasing frequency, combined with interdependency of increased sunlight hours and UV intensity could lead to drier conditions and mean more potential for heatwave and drought. Withered and dried vegetation is at risk of starting wildfire, especially if found in hot cutting areas, stockpile areas, or other sources of heat.

Locations that may be more at risk include, but are not restricted to:

- 'Hot works' e.g., with Oxy propane cutting (aka hot cutting or burning) areas
- Sites with vegetation within the site boundaries

Mitigation could include clearing vegetation where possible, reviewing hot work locations, maintenance and testing of fire watch / fire detection, prevention and response measures.

Interdependency: reduced water availability, prolonged heat, dry conditions, wildfire, increased sunlight hours.

## 1.3 HEAT STRESS ON PLANT, PIPE WORK AND FITTINGS.

Daily summer temperature of around 7 °C higher, with the potential to reach extreme temperatures of over 40 °C with increasing frequency could mean there is the potential for pipework and fittings to become damaged / fail due to stress impact from extreme weather. This could be due to:

- Hot weather increases internal pressure, causing pipes to burst.
- Extreme fluctuation in weather makes pipes expand and contract. Eventually, this can lead to pipes breaking from material fatigue/ cracking/ splitting.

Pipes are found in kitchens, toilets, firefighting, dust suppression, and hydraulics.

The mitigation for this could include:

- Regular inspection and preventative maintenance of the site, plant, or equipment, pipework, and fittings.
- Protecting pipes with a heat shield or thermal insulation to regulate temperature and keep out of direct sunlight.
- Drain systems when not in use

Interdependency: intense heat, fluctuating extreme temperatures, water availability, fire response, fire and dust suppression, site operations, housekeeping.

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 5 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

## 1.4 POTENTIAL INCREASED DUST EMISSIONS

Increased temperatures at an increasing frequency may dry out materials / ground, increasing the potential for dust to generate in places like treatment areas, stockpiles, unmade ground, and site roads.

Locations that may be more at risk include, but are not restricted to:

- Shredder or Cable granulation sites
- OLRP (off-line recovery process) including but not restricted to
  - ASR (automotive shredder residue)
  - NFR (non-ferrous residue)
  - Incinerator scrap
- MRF activities

Mitigation could include replacing any hardstanding roads with concrete or tarmac, regular /increased site cleaning/housekeeping, use of dust suppression systems, covering non-metallic waste or fine fraction bays, enclosing treatment or equipment and conveyors to shield from wind.

Interdependency: reduced water availability, prolonged heat, intense heat, dry conditions, drought, increased sunlight hours

## 1.5 POTENTIAL TO ATTRACT PESTS AND ODOURS.

Increased temperature or prolonged heat could cause stockpiled metal food and drink containers, any residues in End-of-Life Fridges, any domestic waste present as non-conforming waste in the scrap, domestic waste arisings from welfare facilities to foul, attracting pests and causing odours. Flies, mosquitos, and ticks thrive in a warmer and wetter climate. This may allow insects to accelerate reproduction rates and extend lifespan, resulting in more insect. Locations that may be more at risk include, but are not restricted to:

- Sites that receive loose or baled Used Beverage Cans (UBC)
- Sites that receive End of Life Fridges
- Sites that receive municipal wastes

The mitigation could include:

- Regularly empty and refill large water containers. Keep covered if possible.
- Robust waste acceptance procedures to prevent excessively odorous or insect infested loads being deposited at the site.
- Waste inspection and quarantine procedures to remove any odorous waste.

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 6 of 26
Authorised by	V. Jones head of Environment & Sustainability	Issue date	February 2026

- Waste storage duration limits for wastes likely to attract pests, cause odour.
- Storage areas and bays are cleaned and washed down regularly.
- Treat wastes with odour control systems (where appropriate)
- Treat waste with insecticides to reduce risk of flies/ pests (where appropriate).

Interdependency: prolonged heat, intense heat, pests, community complaints, increased sunlight hours, personnel availability, health, and wellbeing

## 1.6 HOT TEMPERATURES POTENTIALLY IMPACT WELLBEING.

Prolonged hot temperatures can cause difficulty sleeping and working. This heat stress could lead to fatigue, aggression, and general wellbeing issues both physically and mentally. It is also likely that those who struggle with health in extreme temperatures may be unable to work for extended periods of time. Particularly impactful to those whose work is outdoors or is particularly strenuous.

Mitigation for this could be to educate workers on how to stay cool, provide air-conditioned areas, reasonable opportunity to take breaks, hydration stations. Consider moving work areas into shade, find tools to make the work less manual.

Interdependency: personnel availability, wellbeing, temperature, operations

## 1.1 MORE UV AND POTENTIAL FOR PLASTIC DEGRADATION

Increase in sunlight hours and UV intensity has the potential to speed up material degradation in rubbers and plastics. This may shorten the lifespan of items:

- IBCs
- Hose pipes.
- Conveyors

Mitigation could include storing UV sensitive materials away from direct sunlight, condition monitoring of containers and hoses, replace yellowed plastic as needed.

Interdependency: Heat, Increased daylight hours, UV, Chemical, Water availability, site operations, housekeeping, firefighting

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 7 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

## 2 WINTER DAILY TEMPERATURES

This could be 4 °C more than the current average with the potential for more extreme temperatures, both warmer and colder than present. (Environment Agency, 2023)

### 2.1 INCREASED RISK OF FREEZING PIPES

With more potential for extremes of temperature including colder than present, there is a risk that pipes may become blocked due to freezing temperatures or split due to expanding contents as it freezes. This could impact availability of water for firefighting and dust suppression, or for site operations like housekeeping or welfare.

The mitigation could include insulating and trace heating exposed pipework. Regular inspections to check for leaks / the condition of pipework.

Interdependency: heat stress on pipes, fluctuating extreme temperatures, water availability, fire response, fire and dust suppression, site operations, housekeeping

### 2.2 INCREASED RISK OF POTHOLES

The potential for extremes of temperatures, both warmer and colder / fluctuating cold and icy temperatures creates freeze/ thaw cycles. This has potential to deteriorate concrete and tarmac faster. Combined with increased rain and surface water could lead to deterioration of site surface.

The mitigation could include increased monitoring to assess when surfaces need replacing. Other measures to reduce surface water, such as drainage and camber.

Interdependency: fluctuating temperatures, access, site operations, safety, flooding

### 2.3 SNOW LOADING & INFRASTRUCTURE DAMAGE

While there are fewer freezing days predicted, winter is forecast to become more extreme with the changes in climate. This could mean heavy snowfall which may land on roofs or structures and cause them to collapse under the weight.

Mitigation could include slanting roofs and regular cleaning of roof to ensure snow can slide easily, review of structures to ensure they can withstand heavy snowfall.

Interdependency: fluctuating temperatures, road conditions, site operations, safety, buildings.

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 8 of 26
Authorised by	V. Jones head of Environment & Sustainability	Issue date	February 2026

## 2.4 PRECIPITATION (SNOW, RAIN, FOG) & VISIBILITY

Precipitation (rain, hail, snow) is predicted to become more intense, obstructing visibility of signage and hazards, particularly in heavy snow fall.

Mitigation could include adding lights to signage and barriers to make it stand out in dark/poor visibility. Also, protective shield over sign to protect from obstruction.

Interdependency: cold temperatures, precipitation, site operations, safety, visibility

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 9 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

### 3 DAILY EXTREME RAINFALL

Average winter rainfall may increase by over 40% on today's averages. Daily rainfall intensity could increase by up to 20% on today's values.

#### 3.1 OVERWHELMED DRAINAGE SYSTEMS AND INTERCEPTORS.

There is potential for drainage systems and interceptors to be overwhelmed, either due to considerable increase in flow into system, or because of a reduced output flow rate due to blockage or high river flows.

The mitigation for this could be making sure:

- suitable measures for the management of flood waters, where relevant
- drainage systems are inspected and kept.
- external areas where wastes are managed/stored have held drainage.
- drainage & effluent treatment has sufficient storage/ treatment capacity.

Interdependency: intense rain, prolonged rain, flooding, drainage, reduced receptor resilience, Flood – Surface / Rainfall (Pluvial), containment

#### 3.2 LOSS OF POWER DUE TO FLOODING

Flooding risk to electrics, especially if any key electrical infrastructure is at a low level.

Mitigation plans include review location of electrical equipment on site, review location of plug sockets and other outlets and consider if they need to be raised or pumps installed. Cable management and desk spaces are well organised to prevent cables at ground level.

Interdependency: infrastructure, power, intense rain, flood, drainage, operations,

#### 3.3 EQUIPMENT DAMAGE

Flooding may damage mobile and static equipment on site. For example, water ingress to engines or electrified plant may make them inoperable after. Water may also ingress offices and damage ICT equipment and paper records.

Mitigation could include move mobile plant to a higher area / another site in preparation for flooding. Locating ICT equipment off the ground and ensuring paper records are kept off the ground.

Interdependency: operations, power, intense rain, flood

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 10 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

### 3.4 STOCKPILE MOVEMENT.

Flooding has potential to lift material from stockpile and carry it to another location. This could be another area on site, or potentially outside of site boundaries. All material is at risk, but particularly large flat sheets, flat bottomed containers and lighter fractions.

Mitigation could include erecting barriers prior to heavy rain warnings.

Interdependency: Storms, safety, flood, intense rain, prolonged rain

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 11 of 26
Authorised by	V. Jones head of Environment & Sustainability	Issue date	February 2026

## 4 AVERAGE WINTER RAINFALL

Following EPR and COMAH guidance

### 4.1 POTENTIAL FOR INCREASED SITE SURFACE WATER AND FLOODING

Predictions indicate up to 20% increase in the intensity of rainfall and average winter rainfall may increase by over 40%, this may cause flooding (Flood – Surface/Pluvial). This could be amplified if it comes after a period of drought where the ground becomes less absorbent (Flood – Groundwater).

Mitigation for this would be to prepare flood plan with reference to the guidance [Preparing for flooding: A guide for sites regulated under EPR and COMAH](#). This should include:

- identification and risk assessment of process equipment and services at greatest risk from flooding
- provision of emergency pumps to remove floodwater and identification of lowest risk location for discharge of floodwaters.
- protection of control and electrical systems
- identification and protection of flat bottom tanks at risk of floating in floodwater
- identification and risk assessment of hazardous liquid storage areas that could become overwhelmed by floodwaters and cause contamination of floodwaters.

Interdependency: rainfall, drought, groundwater, operations

### 4.2 POTENTIAL FOR DRAINAGE AND INTERCEPTORS OVERWHELMED

Potential for drainage systems and interceptors to be overwhelmed.

The mitigation for this could be making sure:

- suitable measures are in place for the management of flood waters, where relevant
- drainage systems are inspected and maintained.
- external areas where wastes are handled or stored are provided with contained drainage.
- the site drainage system and effluent treatment plant has sufficient storage or treatment capacity.

Interdependency: rainfall, drought, groundwater, operations

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 12 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

## 5 SEA LEVEL RISE

Sea level rise could be as much as 0.6m higher compared to today's level. (Environment Agency, 2023) This is because of global ice melt and sea warming due to climate change.

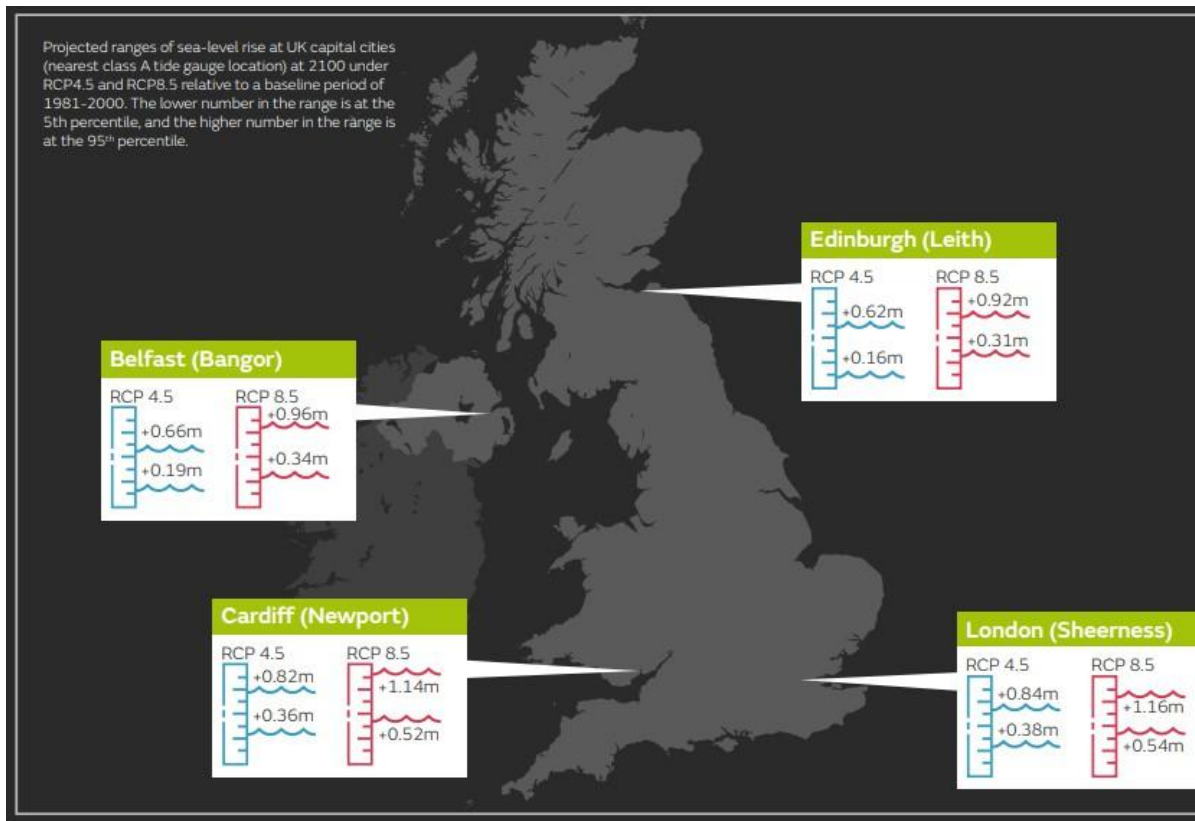


Figure 1: UK Sea Level Rise (Met Office, 2023)

### 5.1 POTENTIAL INCREASED RISK OF COASTAL FLOODING

If a site is low lying and located near the coast there is potential increased risk of flooding.

Locations that may be more at risk include:

Sites located near the coast e.g. Dock sites or sites located on tidal estuaries.

The mitigation for this would be to produce a flood plan with reference to the guidance *Preparing for flooding: A guide for sites regulated under EPR and COMAH*

See section 4.1 above re flooding.

Discuss with the Port Authority / Regulators regarding their plans for flood defences.

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 13 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

Depending on the severity / frequency of the flooding, or if there is the potential for the sea level rise to result in chronic flooding, the mitigation could be significant e.g. engineering solutions to elevate plant / equipment / infrastructure to a higher elevation to prevent flooding, worst case may be necessary to plan to move operations from these locations.

Interdependency: flooding, lightning, access, personnel availability

## 5.2 POTENTIAL INCREASED RISK OF COASTAL SURGE

Coastal surge is caused by high winds and changes in pressure which cause local sea level to rise significantly. Coastal surge poses a unique risk as they can only be predicted up to 36 hours in advance. Increased salinity may cause worse damage in flooded areas and makes it a better conductor - therefore higher impact of potential lightning strike.

Locations that may be more at risk include:

Sites located near the coast e.g. Dock sites or sites located on tidal estuaries.

Mitigation plans could include tuning into storm warning alerts, incorporating storm surge potential into flood plans, discussion with Port Authorities / Regulators regarding their plans for building of defences e.g. sea walls, storing electric equipment away from sea surge risk areas.

Interdependency: Storms, wind, flooding, lightning

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 14 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

## 6 DRIER SUMMERS

Summers could see potentially up to 40% less rain than now (Environment Agency, 2023) which could mean that sites are drier and there is also the potential for there to be a reduction in quantity of clean water available.

### 6.1 POTENTIAL INCREASED USE AND RELIANCE ON MAINS WATER FOR DUST SUPPRESSION, CLEANING.

Extended periods of hot and dry weather may mean that water is scarce on site, regionally or nationally (e.g. drought/ hose pipe bans etc.) reducing the availability of water for dust suppression, firefighting and general operations e.g. cooling systems, welfare etc.

This has the potential to impact all sites, but sites that store or treat wastes with the potential to generate dust are at increased potential risk,

- Shredder sites
- OLRP
- Granulator
- MRF

or sites who store combustible wastes whose combustion risk may increase if the wastes are very dry:

- Shredder sites
- OLRP
- Granulator
- MRF

The mitigation for this could include:

- reviewing the current level of water usage.
- plan to reduce water usage, for example re-circulation.
- exploring options for water harvesting and storage on site
- reviewing which systems and processes have a critical need for water and what the baseline requirements are.
- discuss with utilities about supply of water and any drought restrictions.
- reviewing fire suppression plans including water, and considering what alternative means of firefighting are when water is scarce.
- Consider this in your dust management plan and fire prevention plan.

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 15 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

## 6.1 POTENTIAL INCREASED USE AND RELIANCE ON MAINS WATER FOR FIREFIGHTING.

Water is required for firefighting as detailed in fire prevention plans. If there is a general lack of water available for suppression, the ability to suppress a fire decreases and exposure to fire damage increases.

The mitigation for this could include reviewing the fire prevention plan and assessing stockpile sizes along with firefighting capabilities. Looking at alternative suppression methods - drawing from alternative water sources in emergency (dock, river, etc), considering foam blanket cannons or CO2 dousing, increase quantity of prefilled IBCs on site and consider filling with rainwater during wet periods.

Interdependency: drought, extreme hot temperature, prolonged hot temperature, stockpile

## 6.1 POTENTIAL INCREASE IN DUST EMISSIONS FROM A SITE

40% less rainfall in summer/ 7 °C increase in summer temperatures can lead to increased evaporation which may cause excess dust (as outlined in 1.4). It can also lead to water scarcity which may reduce water available for suppression.

When sites are drier the risk of potential for dust generation increases and the ability to suppress it / complete effective housekeeping decreases.

The mitigation for this would be to look at the dust management plan to see whether current mitigation measures are optimal. Then to source water from a reliable source, such as mains water with adequate availability. To harvest grey water in periods of wet weather for use when dry. It could also mean sourcing low water cleaning solutions, such as vacuums and extractor fans to collect any dust.

Interdependency: drought, extreme hot temperature, prolonged hot temperature, stockpile, emissions, housekeeping, cleaning

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 16 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

# 7 RIVER FLOW

The flow in the watercourses could be 50% more than now at its peak, and 80% less than now at its lowest. (Environment Agency, 2023)

## 7.1 LOW RIVER FLOW POTENTIALLY INCREASES IMPACT OF DISCHARGE TO WATERCOURSE.

There is potential increased impact of discharge to watercourse from on-site drainage systems where they are connected to water courses.

Increased rainfall intensity and higher risk of flooding on site may increase risk of contamination in site surface run off and hence potential increased impact of the site discharge on a receiving watercourse.

Though it is noted watercourses will also have greater volume of water “up to 50% more than now at its peak, and 80% less at its lowest” (Environment Agency, 2023) and as site discharges are rainfall dependant the impact may be mitigated to some extent.

The mitigation would include:

- review environment risk assessment: discharge to water from on-site drainage.
- checking the existing environmental risk assessment to make sure low river flow used in assessment still is valid
- if not, discuss with the Environment Agency (local site inspector and water quality team) and do an updated environmental risk assessment
- reviewing effluent treatment process if added impact is predicted for the receiving watercourse.
- Consider improvement measures for effluent treatment process if applicable.
- See above re measures for hazardous liquid storage in event of flood.
- Cover non-metallic fraction and shredded POPs waste storage bays.
- Cover swarf and bays for the containment of oily wastes.

Interdependency: Flooding (Fluvial), drainage, wildlife, ecological receptors, drought, hot summers.

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 17 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

## 7.2 HIGH RIVER FLOW, OR SEWERS AT CAPACITY, POTENTIALLY ALLOW DISCHARGE AND DRAINAGE BACKING UP ON SITE.

There is a risk that watercourse flows are too high, or sewers are at capacity, resulting in the site flooding as unable to discharge water via drainage system, leading to water backing up on site.

The mitigation for this could include checking the potential for high flows in the receiving watercourse to cause surface water backing up and flooding the site.

Consideration of buffer storage capacity at site, alternative means of water disposal, but there is no mitigation for this if the rivers / national sewage infrastructure is unable to cope. Ultimately the site may have to cease operations if becomes unsafe, for the duration of the flooding.

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 18 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

# 8 STORMS

Storms could see a change in frequency and intensity. The unique combination of increased wind speeds, increased rainfall, and lightning during these events increases the potential for more extreme storm impacts (Environment Agency, 2023)

## 8.1 POTENTIAL INCREASE IN HAIL

- Winter - Hail more likely in West England and South Wales.
- Spring - Hail more likely in East England and SE Scotland.
- Summer – Hail less likely, but more intense/ damaging when it does occur, mostly in NE England.
- Potential risk for hail in UK to increase overall.

Mitigation plans could be to monitor weather forecasts, reinforce importance of hard hats, supply shelters to those whose designated working areas are outside.

Interdependency: storms, hail, operations, damage

## 8.2 POTENTIAL INCREASE IN LIGHTNING

Potential increase of lightning which could potentially have affects such as shutting off power or starting a fire.

Mitigation plans could include installing lightning conductors to control flow and reduce likelihood of strike on a building / static plant or other fire risk area.

Interdependency: storms, temperature, sea level rise/ salinity/ conductivity, fire, Unplanned shutdown / startup issues

## 8.3 STORM HAS POTENTIAL TO DISRUPT OPERATIONS

Potential for higher winds due to weather fronts combining. Effects of this could be exceeding operating conditions for cranes, increased risk for transport,

The mitigation for this could include reviewing storm risk at each site (e.g., UK tornado alley) and prevalent wind patterns. Reviewing operating conditions.

Interdependency: storm, wind, operations, Unplanned shutdown / startup issues

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 19 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

## 8.4 STORM HAS POTENTIAL TO DAMAGE BUILDINGS AND INFRASTRUCTURE

Potential for higher winds due to weather fronts combining. Effects of this could be material displaced by wind, damage to buildings and property, roofing coming up. Storms and high winds could damage building structures with increased potential for fugitive emissions.

The mitigation for this could include:

- Reviewing site storm risks (e.g., UK tornado alley), prevalent wind patterns
- reviewing the design of vulnerable structures and buildings
- reviewing wind loading calculations, supplying reinforcement if necessary
- maintaining building integrity

Interdependency: storm, wind, damage, drainage

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 20 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

## 9 OTHER

Risks related to general operational disruptions, such as potential for ground movements, reduced personnel availability, and reduced access to utilities.

### 9.1 LAND SUBSIDENCE/ SINKING

Unstable groundwater levels create risk of subsidence. Risk of subsidence is higher in periods of prolonged dry weather followed by heavy rainfall, and near to clay soils or over pumped aquifers. Risk includes road/site inaccessible, machinery unstable.

Mitigation of subsidence would be to research soil patterns in region and highlight any sites which lay inside. Consider the types of processes going on, if they are business critical, if they could move to a lower risk site.

Interdependency: intense rainfall, freeze thaw, prolonged dry weather, groundwater

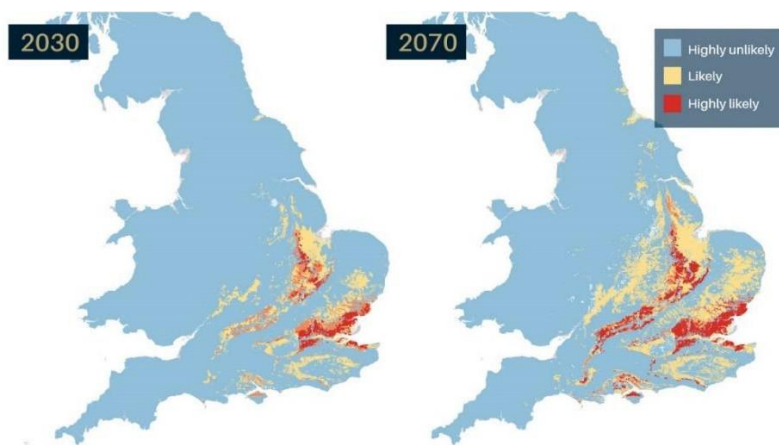


Figure 2: Subsidence Risk Areas (UKRI, 2022)

### 9.2 EROSION OF LAND ON/ NEAR SITE.

Prolonged and repetitive impact of sea or rivers on land causes erosion. Erosion could worsen with more frequent or intense rainfall and storms. In coastal areas, this could lead to cliff faces eroded and undercut, eventually leading to the coast receding inland. In rivers, this could lead to redirection of flow or widening to engulf surrounding habitats.

Mitigation plans could include putting in erosion measures like barriers or reinforcing plants and rocks which may reduce direct impact of water.

Interdependency: storm, flooding, sea level rise

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 21 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

### 9.3 ROCK FALL ON SITE

Extreme weather and increased freeze thaw cycles can affect cliff stability.

Mitigation: Put up protective measures to hold rocks. Reduce operations in these areas.

Interdependency: temperature fluctuation, storm, intense rainfall, subsidence.

### 9.4 LACK OF PERSONNEL

For whatever reason, climate change may affect people's ability to work. This could result in time lost, loss of experience/ information, increased training of new hires.

Mitigations include occupational health monitoring, promote good health practices and business health insurance, write work instructions, train people in multiple areas.

Interdependency: heat & health, transport, flood, heatwave.

### 9.5 NO IMMEDIATE SITE ACCESS

Some or all personnel cannot access site. Could be due to events in proximity to site, or potentially between personnel home location and site. There is no one competent on site able to run. Customers are not able to reach site.

For example, consistent and prolonged rainfall, or intense rainfall may cause flooding to the extent where there is no way to access site.

Mitigation plans could include to set up security system cameras, work from home set ups for key personnel, assign emergency personnel/ managers who live nearby and may be able to make it to site and be a first port of call-in emergency.

Interdependency: drought, absorbency, intense rain, transport, personnel availability.

### 9.6 DISRUPTION OF TRANSPORT & SUPPLY CHAIN

- No transport to collect waste product from site.
- Cannot get spare parts or personnel to fix any equipment.
- Lack of PPE/ Resources (e.g., N95 masks)

Mitigation plans could include:

- Informing customers of alternative sites which are open for business.
- Keep well documented and well stocked set of spare parts.
- Monitor stockpiles, stop processing if getting close to limits with no outlet.

Interdependency: flood, subsidence, snow, operations, access, personnel availability

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 22 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

## 9.7 LOSS OF POWER & COMMUNICATIONS

Risks could include no access to emergency services, not able to run major processes like loading ships or shredding, and no lighting.

Mitigation plan could include:

- Do not continue to perform offline processes.
- Short walk around to ensure stockpiles and housekeeping is in place.
- Shut site and send everyone home if possible.

Interdependency: storm, lightning, flood, power loss, operations, personnel availability, unplanned shutdown / startup issues

Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 23 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

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Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 24 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

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Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 25 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026

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Author/ Reference number	Donald Ward Limited_Climate Change Risk & Adaptation	Page number	Page 26 of 26
Authorised by	V. Jones Head of Environment & Sustainability	Issue date	February 2026