Appendix 9: Climate change adaptation plan

Purpose	▪ The objective of this procedure is to evaluate potential climate change impacts and to identify and take action to minimise and mitigate these potential impacts.
Scope	▪ This procedure covers all operational areas and includes activities under the control of the site environmental permit, and also those outside of the permitted areas but within the wider Mondelez Sheffield site.
Responsibilities	▪ Accountable – Plant Director, Sheffield ▪ Responsible – Site HSE Manager, Sheffield ▪ Informed – All site personnel
Site Permit number/ Regulators	▪ Environmental Permit ref. no.: EPR/ZP3722SD (Environment Agency) ▪ Sheffield City Council, Environmental Health ▪ Yorkshire Water (trade effluent consent refs: 3390775, 3390785, 339008, 3390082)

Background and aims

This Climate Change Adaptation Plan is specific to the Mondelēz International (Mondelez) Sheffield site and sets out Mondelez's evaluation of and response to potential climate change-related impacts on the surrounding environment and site business operations. This plan has been prepared in line with Sheffield's environmental permit compliance requirements. This Climate Change Adaptation Plan sits within the wider framework of Mondelez's corporate and local policies, procedures and initiatives.

Climate change: overview and implications

Climate change refers to long-term shifts in temperatures and weather patterns and is caused by emissions of greenhouse gases which act like a blanket wrapped around the Earth, trapping the sun's heat and raising temperatures.

The main greenhouse gases that are causing climate change include carbon dioxide and methane. Carbon dioxide emissions are generated primarily from burning fossil fuels (around 90% according to the United Nations[1]); other significant sources include clearing land and cutting down forests. Agriculture and oil and gas operations are major sources of methane emissions. Human activities are responsible for virtually all global heating over the last 200 years and the world is now warming faster than at any time in at least the last two thousand years.

The impact of climate change includes, among others, intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity. Although some of these impacts will directly affect areas outside of regions where Mondelez operates, the impacts are still likely to affect Sheffield site operations and cause potentially significant impacts on business continuity, business efficiency, pollution incidents and non-compliance with the site permit and other legislation. This may in turn lead to reputational impacts and costs to resolve and rectify.

These impacts are already being experienced and are projected to intensify. Further impacts are inevitable due to the locked-in emissions of greenhouse gases already in the atmosphere. The extent to which society can limit these impacts in the future depends on the success in reducing greenhouse gases globally. Although this will influence the extent to which Mondelez will need to adapt, Mondelez needs to take action now to respond to this challenge.

The objectives of this plan are to evaluate potential climate change impacts and take action to:

- Remain in compliance with the site's environmental permit and other applicable obligations and regulations.
- Minimise the site's impact on the environment during an extreme weather event, either through accidental release or abnormal operation.

[1] https://www.un.org/en/climatechange/science/causes-effects-climate-change

- Improve resilience and business continuity by avoiding unplanned start-ups, shutdowns and other business interruptions.

Key responsibilities

Key responsibilities relevant to this plan are summarised in Table 1 below.

Table 1: Key responsibilities

Role	Responsibilities
Plant Director, Sheffield	• Overall responsibility for the site, including actions and initiatives relating to climate change adaptation at the Sheffield site.
HSE Specialist	• Responsibility for day-to-day environmental actions, reporting and compliance requirements. • Communications with the EA in relation to permit compliance requirements. • Overall responsibility for environmental compliance and implementation of corporate initiatives.

Interaction with other business processes

Corporate policies and processes

At a corporate level Mondelez has established four strategic priorities which support its purpose, mission and values, and guide its strategy. These priorities are **growth, execution, culture** and **sustainability**.

In order to deliver the sustainability strategic priority Mondelez has developed a framework known as "**Snacking Made Right**"[2]. Snacking Made Right focuses on social and environmental areas where Mondelez can deliver greater long-term positive impact, including key focus areas of: more sustainable ingredients, more sustainable packaging and climate.

To achieve its environmental, social and governance (ESG) priorities Mondelez has defined a series of sustainability goals which include addressing climate risks, achieving Net Zero by 2050, reducing its carbon footprint, increasing energy efficiency and reducing emissions, using water sustainably, reducing waste and social sustainability across the supply chain (including communities and the environments in which they live and work, ingredients and packaging).

Mondelez International takes steps to identify and assess climate risks within the wider Enterprise Risk Management (ERM) process. The Risk and Compliance Committee (MRCC), composed of leaders from the Finance, Accounting, Legal, Compliance, Internal Audit and People business functions, provides broad oversight of enterprise risks and the ERM process. An annual review of climate risks is undertaken to assess risks in the

[2] https://www.mondelezinternational.com/snacking-made-right/

short, medium and long-term horizons. This is supplemented with ongoing site-level engineering assessments to consider plant-level exposure, taking into consideration risk mitigation measures already in place.

Mondelez Sheffield site

Accidents and Incidents are managed in accordance with the emergency and incident policies and procedures including (but not limited to):

- Emergency response procedure;
- Emergency response plan;
- Sheffield fire strategy;
- Sheffield fire risk assessment.

It is recognised that the Sheffield site is at risk of flooding, and flooding has occurred in the past. Flood response actions, including deployment of flood defences such as flood gates, are specified in the site Emergency Response Procedure.

Review of climate change adaptation requirements

In developing this Climate Change Adaptation Plan an assessment has been undertaken to identify the potential climate change impacts and assess the risks these present. These risks have been analysed to establish whether existing adaptations are adequate, or whether further mitigation measures are required.

A stepwise approach has been followed:

- Identify receptors that may be impacted by a changing climate;
- Identify climate change-related hazards and their potential to impact the identified receptors;
- Identify existing control and mitigation measures;
- Establish which hazards are a priority due to the potential severity of impact and/or insufficient mitigation measures;
- Identify further mitigation opportunities to enhance climate change resilience.

Part 1: Assessment of climate change risks

Site overview

The Mondelez Sheffield confectionery manufacturing plant is located to the northwest of Sheffield city centre within a predominantly industrial / commercial area, beyond which lies a variety of land uses including residential and amenity areas. The River Don runs adjacent to, and also through the site.

The site manufactures a range of confectionery product including hard mints, soft mints, jellies and liquorice products. Other site activities include goods intake, materials storage and handling and ancillary activities include cooling, steam generation, cleaning and effluent treatment.

The site has a very long history; confectionery manufacturing operations have taken place on this site since the 1930s.

Receptors: identification and vulnerability assessment

A review has been undertaken to identify the on-site and off-site receptors that may be affected by climate change impacts. This includes consideration of internal and business-related impacts as well as impacts on third parties and environmental receptors.

For each receptor, consideration has been given to the nature of the receptor and its inherent vulnerability to possible climate change impacts. Receptor vulnerability has been qualitatively assessed as either very low, low, medium, high or very high.

Table 2: Receptor identification and assessment

Receptor description	Assessment of receptor vulnerability to climate change impacts	Overall vulnerability rating
Environmental receptors – potential for climate change hazards to lead to environmental impact on site and in its immediate surroundings		
Surrounding residential neighbours	• The site is located within a predominantly industrial / commercial area; the closest residential area is located approximately 120 m to the east and 185 m to the west of the site. Residential areas are separated from the site by other industrial / commercial sites and to the west by the main A61 trunk road, which are likely to be a significant source of noise. Residential housing is located also approximately 300 m to the northeast and at a greater distance to the north and southwest. • Higher summer temperatures may lead to increased requirements for cooling on site, both in terms of the number and size of units and their likely hours of operation. This may coincide with an increase in the proportion of the year that	Low

Receptor description	Assessment of receptor vulnerability to climate change impacts	Overall vulnerability rating
	residents use outside spaces and/or sleep with windows open. • Although Mondelez Sheffield does not have a history of noise complaints, excess noise has the potential to cause nuisance and/or human health effects on site neighbours, impacting Mondelez's relationship with the local community. • Noise nuisance has the potential to constrain, or increase costs associated with future site developments e.g. new refrigeration plant or other assets that may be required to mitigate or manage climate change-related impacts.	
Surface water: River Don	• The River Don flows adjacent to and through the site, flowing generally in a south easterly direction. • A small tributary of the River Don is present adjacent to the north eastern part of the installation, flowing generally southwards before its confluence with the Don approximately 100m to the south east of the installation. • A culverted watercourse is present beneath the yard in the west of the installation. The culvert is understood to convey water overflow from the pond located in Hillsborough Park approximately 300 m to the west. The culvert flows beneath the yard in a northerly direction before discharging to the River Don. • The site is located within the Upper Don water body catchment, from Little Don to River Loxley confluence. This catchment is designated as heavily modified and received a Moderate ecological status in 2022 (the most recent assignment). • Only clean rainwater runoff is discharged directly to the River Don. • All process effluent (except a small quantity which is tankered off site) is directed to Yorkshire Water's Blackburn Meadow wastewater treatment works for full treatment prior to discharge to the River Don at a location downstream of the site. An effluent treatment plant is located on site to provide partial effluent treatment comprising flow balancing and pH correction for the majority of process effluent. • The EA's Flood Map for Planning (November 2025) shows that the majority of the installation is located within Flood Zone 3 with just a small area south of the River Don located within Flood Zone 2. • The site has previously been flooded from the River Don. Flood mitigation measures, including flood gates are installed around the site and	High

Receptor description	Assessment of receptor vulnerability to climate change impacts	Overall vulnerability rating
	contingency measures are in place to protect the site from future flooding events. • Production activities are undertaken internally with some bulk storage and deliveries in external locations. Primary, secondary and/or tertiary containment measures are in place to protect the river from spillages.	
Underlying ground/ groundwater	• Made ground is known to be present in the northern part of the installation; based on BGS mapping and previous ground investigation results, this has been confirmed to a depth of at least 4 metres below ground level (m bgl) and comprises of granular materials. Made ground is also expected to be present locally across the southern part of the installation given the long history of development. • Natural superficial geology underlying the site is Alluvium, proven to a depth of 6 m bgl and described as gravel, sand and silt. The Alluvium overlies bedrock geology of the Pennine Lower Coal Measures, typically comprising layers of mudstone, siltstone and sandstone including coal seams. The superficial and bedrock aquifer designations for the site are both Secondary A. • The installation is not located within a groundwater Source Protection Zone although there is an active licenced groundwater abstraction located approximately 90m to the west. Intrusive investigation records do not confirm depth to groundwater, but it is anticipated to be in hydraulic continuity with the River Don and expected to provide base flow to the river. • The installation is not located within a groundwater Drinking Water Safeguard Zone. • Hardstanding covers more than 95% of the site. • Underground site drainage has potential to cause contamination of ground/groundwater if containment were to fail. • Mondelez operates a planned preventive maintenance programme. Planned inspections and maintenance of site infrastructure is undertaken.	Medium
Local ecological receptors	• The site is located within a predominantly industrial / commercial area. • There are two European designated habitat sites located approximately 7.5km to the west of the site (at the nearest point): South Pennine Moors SAC and Peak District Moors SPA. • Three Sites of Special Scientific Interest (SSSIs) have been identified within 2km of the site: Neepsend Railway Cutting SSSI, Neepsend	Medium

Receptor description	Assessment of receptor vulnerability to climate change impacts	Overall vulnerability rating
	Brickworks SSSI and Wadsley Fossil Forest SSSI; these are geological designations only. • A number of non-statutory designation habitat sites have been identified within 2km of the site including two local nature reserves (LNRs), 22 Local Wildlife Sites (LWSs) and two Ancient Woodlands. • The River Don, running through the site, is identified as a protected fish migratory route. • The presence of protected species on site and in immediately surrounding land cannot be ruled out (this has not been investigated in the development of this plan).	
Local/global atmosphere	• Activities on site contribute to local and global air pollution. Air emissions may increase as a result of extreme weather events e.g. as a result of an increase in site energy use or accidents that lead to air emissions e.g. fire, refrigerant gas leaks etc. • The site is located within the Sheffield Citywide Air Quality Management Area (AQMA). The designated AQMA covers the entire eastern part of the city containing the major built up areas, and was declared due to transport, industrial and domestic sources. The Mondelez Sheffield site will contribute to NO_2 within the AQMA, associated with NOx emissions from the boiler plant. The site operates recently installed modern, ultra-low NO_x emission boilers, firing natural gas only.	Medium
Business operations – potential for climate change hazards to impact on production activities. These impacts may or may not also have an associated environmental impact		
Site assets	• The River Don runs through the factory site. Whilst the factory area is significantly higher than the river level there is a history of site flooding from the river in 2007 (severe flooding occurred) and 2019 (minor flooding event). Flood mitigation measures, including flood gates, flood walls and non return valves have since been installed around the site and contingency measures are in place to protect the site from future flooding events. It is noted that the 2007 flood event was exacerbated by a bridge collapse close to the site which partially blocked the river channel. • The EA's Flood Map for Planning (November 2025) shows that the majority of the installation is located within Flood Zone 3 with just a small area south of the River Don located within Flood Zone 2. • Most business and production activities are undertaken within structures on site. However,	High

Receptor description	Assessment of receptor vulnerability to climate change impacts	Overall vulnerability rating
	many of these structures and much of the equipment were selected and installed at a time when changes in climatic conditions were not expected e.g. higher summer temperatures, more intense rainfall events.	
Utility supplies/IT and communications	• Site effluent is discharged to Yorkshire Water's Blackburn Meadows Wastewater treatment plant. • Site energy requirements include mains electricity supply and mains gas supply. • The steam raising boilers are gas-fired from the mains gas supply. • Loss of communications networks (e.g. due to mains electricity failure or damage to assets) has potential to disrupt production processes, equipment and business operations. There is an electricity generator on site to supply electricity to the IT server in the event of mains electricity failure. Other equipment will revert to fail safe mode in the event of electricity supply disruption.	High
People	• Extreme weather such as intense rainfall or snow and flooding has the potential to impact the ability of staff to access the site. However, the site is located in an urban area with numerous public transport options in addition to private car use. The majority of site staff live relatively close to the site and therefore commuting via cycling or walking is also an option. • High temperatures may lead to problems for staff comfort.	Low
Logistics/supply chain	• Extreme weather may impact supplies of critical raw materials and despatch of finished product from the site. • Stores of raw materials on site on site are sufficient for approximately 1 week production (although this varies depending on the material). • Finished products are despatched directly to off-site distribution centres (DC) 5 days per week. Average stock levels at DCs are approximately 28 days. Due to stock levels and the nature of the product e.g. having a long shelf life, customer supply chains are relatively resilient to short term production disruption.	Low
Global supply chain	• Climate impacts overseas have the potential to affect the price or availability of agricultural products. • Principal raw materials include sugar, glucose, gelatine and flour. Mondelez sources raw materials from multiple suppliers (e.g. sugar is sourced from UK and Europe) in order to promote supply chain resilience.	Low

Receptor description	Assessment of receptor vulnerability to climate change impacts	Overall vulnerability rating
Financial/market risks	• Global climate change impacts and associated political instability may lead to fluctuating/steep increases in costs of raw materials and energy.	Low

Identification of climate change-related hazards and impacts

An assessment of potential climate change-related hazards has been undertaken and is shown in Table 3 below. For each identified hazard, potential impacts have been identified, as well as existing adaptation and mitigation measures. Hazards with environmental impacts are coloured green, hazards with impacts on business operations are coloured blue and hazards with impacts to both the environment and business are coloured yellow. Priority risks are identified; these are risks with potentially significant environmental or business impacts and/or insufficient mitigations in place. The requirement for new or additional mitigation measures is considered for the priority risks.

Table 3: Climate change risk assessment

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
1	Increased summer temperatures *This may be around 7°C higher compared to average summer temperatures now, with the potential to reach extreme temperatures as high as over 40°C with increasing frequency based on today's values (The EA's guidance requires Mondelez to plan for a 2°C rise by 2050 and assess for a 4°C rise by 2100).*	Damage to site assets e.g. to fabric of building, to equipment over-heating, excessive demands on refrigeration/cooling and equipment, leading to disruption to production processes. Increase in waste generation resulting from disruption to production processes/facilities.	Business operations – Site assets: High	• Planned preventive maintenance programme in place. • Many critical functions have back-up capability. Whilst production processes may be disrupted and back-up/hired equipment may be required, complete failure is unlikely. • Site emergency response plan contains key information in the event of a power failure incident including emergency contact numbers and location and nature of essential services e.g. electrical substations.	No	None
		Nearby residents are more likely to have windows open and spend time in gardens with potential to increase the likelihood of noise nuisance occurring.	Environmental – Surrounding residential neighbours: Low	• There is no residential housing within the immediate vicinity of the site and no history of noise complaints. • HSE Standard SE09 Noise Management is in place and updated to ensure ongoing management of this issue. • Noise impacts are considered when specifying new plant.	No	None
		Nearby residents are more likely to have windows	Environmental – Surrounding	• The manufacturing process can result in the production of sweet and/or	No	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
		open and spend time in gardens. Odour generation potential may increase with warmer temperatures (includes odour from manufacturing and/or waste handling and/or effluent handling and treatment facilities).	residential neighbours: Low	minty odours. Production areas are sealed and odour is not normally noted in external areas. However, confectionery odour has a high hedonic tone and is generally considered pleasant. • There is no residential housing the immediate vicinity of the site and no history of odour complaints. • The ETP comprises flow balancing and pH correction only. Effluent is not stored for any period of time and the likelihood of unpleasant odours being generated is very low. • Site wide waste management provisions include the use of covered bins and receptacles, where necessary, and regular contracted waste collections.		
		Increase in energy consumption due to additional load on refrigeration used to chill closed circuit cooling systems, filled with water/glycol. and cooling towers.	Environmental – local/global atmosphere: Medium	• Mondelez undertakes regular reviews of its operations and assets and invests in new and improved technologies where appropriate. Continual improvement to site energy efficiency is already a key priority for the business, as demonstrated by significant investments made across	No	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
				the site e.g. new boilers, new chillers, new compressors, LED lighting etc.		
		Increased temperature leading to risk of on-site fire e.g. due to machinery overheating, build-up of temperature within raw material storage leading to combustion risks.	All	• Fire risk assessments, management strategy and systems are in place. This includes: fire/smoke detection, alarms, sprinkler system (partial), emergency lighting, weekly testing, evacuation protocols, portable firefighting equipment etc. • There are ATEX controlled areas within the factory (due to presence of dusty materials) with additional precautions in place to minimise explosion risks including use of anti-static shoes, regular cleaning to reduce dust accumulation, provision of explosion panels etc. • Fire prevention and response plans regularly maintained and tested.	Yes	None other than existing measures (including 'in flight' project)
		Increased temperatures leading to uncomfortable or unsafe working environment for staff.	People: Low	• Air conditioning / ventilation / cooling systems are provided where required including areas of staff occupation such as operational control rooms.	No	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
2	Decreased summer temperatures *Potential for more extreme weather conditions including periods of lower summer temperatures*	No negative impacts associated with cooler summer temperatures. Energy demand likely to be reduced. Risks associated with equipment over-heating or excessive demands on refrigeration/cooling equipment would be reduced.	N/A	N/A	N/A	N/A
3	Drier summers with increased risk of drought *Summers could see potentially up to 40% less rain than now.*	Potential for water shortages leading to disruption to production processes. Increase in waste generation due to disruption to production processes/facilities.	Business operations – Utilities supplies: High	• Mondelez operates an Environmental Management System (EMS); continual improvement to site water efficiency is a key priority for the business. • The site is reliant on mains water supplies for cleaning, steam generation, operation of some production equipment and product addition. • In the event of a loss of mains water supply, manufacturing processes would need to be temporarily suspended as there is no alternative supply source. However it is noted that, due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively	Yes	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
				resilient to short term production disruption. Average finished product stock levels are approximately 28 days supply providing supply resilience.		
4	Higher temperatures and drought leading to wildfires	Potential impact on site from wildfires. Whilst the site is located in a predominantly commercial / industrial area, Parkwood Springs open land area is located to the east of the site (separated from the site by the River Don). Fires could cause multiple impacts: evacuation, restrictions on access; smoke, disruption due to activities of emergency services, preventing site access and operation.	Business operations – Site assets: High	• Fire suppression equipment on site includes a partial sprinkler system fed from a fire water tank as well as a ring main with fire hydrants. The site proximity to the River Don also provides readily available source of water for fire suppression. • All personnel are trained in emergency response and emergency evacuation procedures.	No	None
5	Increased risk of storms bringing intense rainfall and flooding and/or high winds. The combination of increased wind	Damage to site assets caused by flooding leading to disruption to production processes; fabric of buildings damaged by prolonged rainfall and/or high winds.	Business operations – Site assets: High	• The River Don borders and runs through the site. Flooding from the river occurred in 2007 and 2019, although it is understood that the 2007 severe flood event was exacerbated by the collapse of a bridge immediately adjacent to the site which caused river	Yes	No

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
	speeds, increased rainfall, and lightning during these events provides the potential for more extreme storm impacts. *The biggest rainfall events are up to 20% more intense than current extremes (peak rainfall intensity).*	Increase in waste generation due to disruption to production processes/facilities		water to back up. The 2019 event was more minor. • Flood defences have been enhanced on site since this flooding. Flood defence gates (5 no.) are located at critical points on site including entrance roads and main electrical supply buildings, as well as flood defence walls and non-return valves. • Sheffield Emergency Response Procedure details actions to be taken in the event of a flood incident, including deployment of flood defence gates. • Materials are stored in appropriately sealed containers, internally and/or in secondary containment bunds and cabinets, to minimise the risk of contents being mobilised or containers being washed away in a flood event.		
		Potential for flood waters/surface water runoff to become contaminated by polluting substances (ingredients, chemicals, oils/fuels, wastes, site effluent)	Environmental – Surface water (River Don): High Underlying ground/ groundwater: Medium	• Materials are stored in appropriately sealed containers, internally and/or in secondary containment bunds and cabinets, to minimise the risk of contents being mobilised or containers being washed away in a flood event.	Yes	No

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
			Local ecological receptors: Medium	• Mondelez operates an EMS, environmental training e.g. spill response is provided to site staff, regular environmental audits and inspections are undertaken, spill response materials are readily available on site. • Maintenance of drainage systems is carried out ensuring drainage network is clear of blockages. • Flood defence and flood response measures have been enhanced in recent years and includes flood gates.		
		Mains electrical supply failure leading to disruption to production processes	Business operations – Utilities supplies: High	• Site emergency response plan contains key information in the event of a power failure incident including emergency contact numbers and location and nature of essential services e.g. electrical substations. • In the event of power failure systems will default to a failsafe mode to prevent overflow, spillages or other unplanned event. • Effluent is transferred to the ETP by overground pumps. In the event of power loss, effluent would weir over and discharge directly to sewer albeit	Yes	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
				without pH correction in the short-term. • Standby generator is available on site to provide electricity to critical IT systems and emergency lighting. • In the event of a loss of mains electrical supply, manufacturing processes would need to be temporarily suspended. However it is noted that, due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively resilient to short term production disruption. Average finished product stock levels are approximately 28 days supply providing supply resilience.		
		Flooding may disrupt transport networks and delay delivery of supplies of critical raw materials to the site or damage raw material stored on site and / or delay despatch of finished product from the site or damage finished product stored on site	Business operations – Logistics/supply chain: Low	• Logistics delays caused by flooding are likely to lead to short term rather than long term disruption. Due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively resilient to short term production disruption. • Average finished product stock levels (stored off site) are approximately 28	No	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
				days supply providing supply resilience. • Longer term/substantial logistics delays may lead to temporary pause in production; this would be managed in a controlled manner.		
		Staff to access the site temporarily restricted due to flooding	Business operations – People: Low	• The site is located in an urban area with numerous public transport options in addition to private car use. The majority of site staff live relatively close to the site and therefore commuting via cycling or walking is also an option to many. • Due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively resilient to short term production disruption. • Longer term disruptions may lead to temporary pause in production; this would be managed in a controlled manner.	No	None
	Increased risk of storms bringing high winds	Damage to site assets e.g. physical damage to fabric of buildings or structural damage by winds, assets blown over, or debris or	Business operations – Site assets: High	• Site emergency response plan contains key information in the event of a power failure incident including emergency contact numbers and	No	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
		power surges damaging electronic control and instrumentation leading to disruption to production processes		location and nature of essential services e.g. electrical substations. • Maintenance carried out by approved contractor. Facilities management contractor has on-site presence. • Hire of temporary equipment would be considered if required e.g. provision for a temporary boiler connection has been provided in the newly refurbished boiler house. • Many critical functions have back-up capability. Whilst production processes may be disrupted and back-up.		
		Loss of communications/IT networks due to storm damage	Business operations – IT/ communications: High	• Site emergency response plan contains key information in the event of a power failure incident including emergency contact numbers and location and nature of essential services e.g. electrical substations. • Standby generator is available on site to provide electricity to critical IT systems and emergency lighting.	No	None
		Mains electrical supply failure leading to disruption to production processes	Business operations – Utilities supplies: High	• Site emergency response plan contains key information in the event of a power failure incident including	No	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
				emergency contact numbers and location and nature of essential services e.g. electrical substations. • In the event of power failure systems will default to a failsafe mode to prevent overflow, spillages or other unplanned event. • Standby generator is available on site to provide electricity to critical IT systems and emergency lighting. • In the event of a loss of mains electrical supply, manufacturing processes would need to be temporarily suspended. However it is noted that, due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively resilient to short term production disruption. Average finished product stock levels are approximately 28 days supply providing supply resilience.		

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
		Extreme weather may disrupt transport networks and delay delivery of supplies of critical raw materials to the site or damage raw material stored on site and / or delay despatch of finished product from the site or damage finished product stored on site	Business operations – Logistics/supply chain: Low	• Logistics delays are likely to lead to short term rather than long term disruption. Due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively resilient to short term production disruption. • Average finished product stock levels (stored off site) are approximately 28 days supply providing supply resilience. • Longer term/substantial logistics delays may lead to temporary pause in production; this would be managed in a controlled manner.	No	None
		Site access temporarily restricted due to blocked transport networks	Business operations – People: Low	• The site is located in an urban area with numerous public transport options in addition to private car use. The majority of site staff live relatively close to the site and therefore commuting via cycling or walking is also an option to many. • Due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively resilient to short term production disruption.	No	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
				• Longer term disruptions may lead to temporary pause in production; this would be managed in a controlled manner.		
6	Increased winter temperatures *Winter daily maximum temperature could be 4°C more than the current average*	No negative impacts associated with warmer winter temperatures – energy demand likely to be reduced. Risks associated with frozen equipment/pipework reduced.	N/A	N/A	N/A	N/A
7	Decreased winter temperatures *Potential for more extreme weather conditions including periods of lower winter temperatures and heavy snowfall.* *Average winter rainfall may increase by over 40% on today's averages.*	Colder winter temperatures would increase energy demand.	Environmental – local/global atmosphere: Medium	• Mondelez undertakes regular reviews of its operations and assets and invests in new and improved technologies where appropriate. Continual improvement to site energy efficiency is already a key priority for the business.	No	None
		Frozen equipment/pipework leading to burst pipes/loss of containment and escape of potentially polluting materials to surface water or ground/ground water	Environmental – Surface water - High; underlying ground/ groundwater - Medium; local ecological receptors: Medium	• Pipe lagging and/or trace heating provided where required. • Regular inspections for issues caused by freezing conditions/ice/snow etc. • Hardstanding covers the majority of the site.	No	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
				• Effluent pipework crossing the river (to and from the ETP) has secondary containment of stainless steel construction, fitted with a drain line directing any leaks to the ETP. A sensor is provided in the drain line to alarm should any leakage occur.		
		Damage to site assets e.g. frozen equipment/pipework leading to disruption to production processes. Damaged pipework could lead to leaks which could potentially compromise food safety.	Business operations – Site assets: High	• Site emergency response plan contains key information in the event of a power failure incident including emergency contact numbers and location and nature of essential services e.g. electrical substations. • Hire of temporary equipment, e.g. boilers, chillers, transformers would be considered if required. • Many critical functions have back-up capability. Whilst production processes may be disrupted and back-up/hired equipment may be required, complete failure is unlikely. • Manufacturing processes would need to be temporarily suspended. However it is noted that, due to the nature of the product e.g. having a long shelf life, customer supply chains	No	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
				would be relatively resilient to short term production disruption.		
		Extreme weather may disrupt transport networks and delay delivery of supplies of critical raw materials to the site or damage raw material stored on site and / or delay despatch of finished product from the site or damage finished product stored on site	Business operations – Logistics/supply chain: Low	• Logistics delays are likely to lead to short term rather than long term disruption. Due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively resilient to short term production disruption. • Average finished product stock levels (stored off site) are approximately 28 days supply providing supply resilience. • Longer term/substantial logistics delays may lead to temporary pause in production; this would be managed in a controlled manner.	No	None
		Staff to access the site temporarily restricted due to snow or ice	Business operations – People: Low	• The site is located in an urban area with numerous public transport options in addition to private car use. The majority of site staff live relatively close to the site and therefore commuting via cycling or walking is also an option to many. • Due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively	No	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
				resilient to short term production disruption. • Longer term disruptions may lead to temporary pause in production; this would be managed in a controlled manner. • Regular inspections for issues caused by freezing conditions/ice/snow etc. to mitigate safety risks associated with pedestrian/vehicular slip hazards.		
		Mains gas supply failure e.g. due to local or regional gas demand exceeding supply, leading to disruption to production processes	Business operations – Utilities supplies: High	• Boilers are gas-fired only. In the event of a loss of gas supply manufacturing processes would need to be temporarily suspended. However it is noted that, due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively resilient to short term production disruption. • Average finished product stock levels (stored off site) are approximately 28 days supply providing supply resilience.	No	None
7	Sea level rise *Sea level rise could be as much as 0.6m*	No negative impacts predicted due to site location in Central England.	N/A	N/A	N/A	N/A

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
	higher compared to today's level					
8	Extreme weather events overseas *Climate change impacts in all countries and territories of the world*	Extreme weather events may disrupt global transport networks and delay delivery of supplies of critical raw materials to the site	Business operations – Global supply chain: Low	• Raw materials supplies on site are sufficient for approximately one week's production (although this varies depending on material). • Dual supply routes are maintained for the principal raw materials used on site, normally via suppliers in both UK and Europe, providing some resilience to supply chain disruptions. • Longer term/substantial delays may lead to temporary pause in production; this would be managed in a controlled manner. • Due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively resilient to short term production disruption. Average finished product stock levels (stored off site) are approximately 28 days supply providing supply resilience.	No	None
		Extreme weather events may affect global harvests or create political instability resulting in disruption to raw material supply chains	Business operations – Financial/market risks: Low	• Raw materials supplies on site are sufficient for approximately one week's production (although this varies depending on material). • Dual supply routes are maintained for the principal raw materials used on	No	None

No	Climate change-related hazard	Potential impacts	Receptors affected/ receptor vulnerability	Existing mitigations/ adaptations	Priority risk? Y/N	Additional mitigation necessary?
				site, normally via suppliers in both UK and Europe, providing some resilience to supply chain disruptions. • Longer term/substantial delays may lead to temporary pause in production; this would be managed in a controlled manner. • Due to the nature of the product e.g. having a long shelf life, customer supply chains would be relatively resilient to short term production disruption. Average finished product stock levels (stored off site) are approximately 28 days supply providing supply resilience.		

Part 2: Climate change adaptation plan

Summary of risk assessment findings

The climate change risk assessment has identified five priority risks. These are listed below.

Increased summer temperatures, leading to:

- Increased temperature leading to risk of on-site fire e.g. due to machinery overheating, build-up of temperature within raw material storage leading to combustion risks.

Drier summers with increased risk of drought leading to

- Potential for water shortages leading to disruption to production processes.

Increased risk of storms bringing intense rainfall and flooding and/or high winds, leading to:

- Damage to site assets caused by flooding leading to disruption to production processes.
- Potential for flood waters/surface water runoff to become contaminated by polluting substances.
- Mains electrical supply failure leading to disruption to production processes.

Future/planned actions to mitigate

Mondelez has measures in place to mitigate potential risks associated with climate change. These include day-to-day activities such as:

- Ongoing planned preventive maintenance.
- Ongoing maintenance of infrastructure.
- Provision of emergency response equipment and testing of emergency response plans.
- Strategic work to enhance business resilience such as sustainability initiatives focussed on improving energy and water efficiency.
- Regular review and update of emergency response procedures.

Plan review and update

This climate change adaptation plan shall be reviewed every five years, or more frequently in the event of any change that may affect the plan, for example:

- Following changes to operational processes, equipment or infrastructure on site that may affect resilience to climate change (either to increase or decrease climate change resilience).
- Following significant changes to emergency or other key procedures.
- Following the introduction or discovery of new potentially sensitive receptors (e.g. new residential housing, change in the site boundary through sale of land, discovery of sensitive ecological receptors such as protected species), or

- Due to any new understanding or information related to climate change hazards and impacts and its potential to impact the Sheffield site.

This climate change adaptation plan shall also be reviewed and updated in the event of an extreme weather event or near miss. Appendix A should be completed following an incident and relevant learnings used to inform a review and update of the climate change risk assessment and adaptation plan.

List of acronyms

- Air Quality Management Area (AQMA)
- Best Available Techniques (BAT)
- Climate Change Adaptation Plan (CCAP)
- Effluent Treatment Plant (ETP)
- Environment Agency (EA)
- Environmental Management System (EMS)
- Environmental, Social and Governance (ESG)
- Enterprise Risk Management (ERM)
- Health, Safety and Environmental (HSE)
- Local Wildlife Site (LWS)
- Mondelez Risk and Compliance Committee (MRCC)
- Site of Special Scientific Interest (SSSI)
- Source Protection Zone (SPZ)
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Special Wildlife Site (SWS)
- Uninterruptible Power Supply (UPS)

Appendix A: Severe weather event record and response evaluation

Date of weather event:		
Description of severe weather event: *Description of weather event, the event duration and secondary impacts e.g. surface water or river flooding, wind damage etc*		
Description of actual or potential business impacts, if any: *Consider loss or damage to equipment/production time, impacts on supply logistics, staff availability, communications and utilities etc. Consider potential impacts of near miss events.*		
Description of actual or potential environmental, health and safety impacts, if any: *Consider loss or containment/spillage/pollution to air, land or water, impacts on site staff and site neighbours. Consider potential impacts of near miss events.*		
Description of all measures taken to mitigate impacts: *Actions taken to mitigate potential impacts, whether or not these were successful and whether or not the incident was a near miss event.*		
Assessment of the adequacy of these mitigation measures: *Evaluate the event, its impacts and the degree of preparedness. Were responses planned appropriately and were suitable mitigations implemented effectively?*		
Opportunities for improvement: *Where actions are identified to improve business preparedness and/or to provide additional measures /resources to mitigate impacts, these should be listed below.*		
Action	Responsibility	Timescale for completion
Date of evaluation:	Form completed by:	