



Environmental and Climate Change Risk Assessment

Substantial Permit Variation

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Substantial Permit Variation



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1. INTRODUCTION

As part of an application for an environmental permit, operators must assess the risk to the environment and human health from the activities they seek to permit. There is also a requirement to consider the effects a changing climate may have on the environment and human health in relation to their activities.

This Environmental and Climate Change Risk Assessment has been undertaken in accordance with the online Environment Agency Guidance for undertaking environmental risk assessments, and sector-specific climate change risk assessments.

Environmental risks relevant to the site activities are:

- Emissions to air;
- Emissions to water;
- Emissions to sewer;
- Emissions to land;
- Noise;
- Odour;
- Litter;
- Pests;
- Vandalism;
- Fire; and
- Spillages and Leakages.

Climate change hazards relevant to the site activities are:

- Increased Summer Temperatures;
- Decreased Summer Rainfall;
- Increased/Decreased Winter Temperature;
- Increased Winter Rainfall;
- Increased likelihood of storms; and
- Wildfires.

For each of the above environmental and climate change criteria, the approach to the assessment has followed the following five stage process:

- Identify the hazards;
- Identify the risks;
- Evaluate the vulnerability of the site to the risk;
- Outline appropriate risk management and adaptation measures to control these (if required); and
- Present the assessment.

2. SITE DETAILS

2.1 Site Location

The proposed site is located at Belasis Avenue, Billingham, TS23 1LN. The site is currently operated under Environmental Permit EPR/BJ8987IQ/V003.

2.2 Site Description

Fujifilm Diosynth Biotechnologies UK Ltd ('FLBK' or 'The Applicant' hereafter) is making an application to carry out a 'Substantial' Variation of their existing EPR permit under *The Environmental Permitting (England and Wales) Regulations 2016 (as amended)* to address a number of changes on site.

The existing Installation undertakes the manufacture of a range of pharmaceutical products based on chemical and biological manufacture. These products are sold for further onward processing by third parties to form finished pharmaceutical products or are included in third party pharmaceutical products and medicines. The permitted activities currently meet the definition of an 'Installation' by virtue of Schedule 1:

Section 4.5 'Pharmaceutical Production' Part A(1)(a) Producing pharmaceutical products.

In summary, the following new permitted Activities will be added to the existing permit as a result of this permit variation:

- Borealis – a new biotech manufacturing facility comprising 5 processing lines. The facility will meet the definition of a new Stationary Technical Unit as defined by Section 4.5 Part A(1)(a).
- BIC-UK – an R&D facility previously known as Project Kibou. Although the facility will be used for R&D purposes only, as per the Environment Agency *Note 4.3 of Regulatory Guidance Note No. 2 Understanding the meaning of regulated facility - Appendices 1 and 2*, the facility cannot be defined as pure R&D. It is therefore understood that the facility will be required to be permitted as a separate Section 4.5 Part A(1)(a) Activity.
- Boiler plant upgrades which will require an amendment to the existing DAA on site for a new Medium Combustion Plant Activity.
- Dewar Store and Nitrogen Tank which will meet the definition of a DAA.

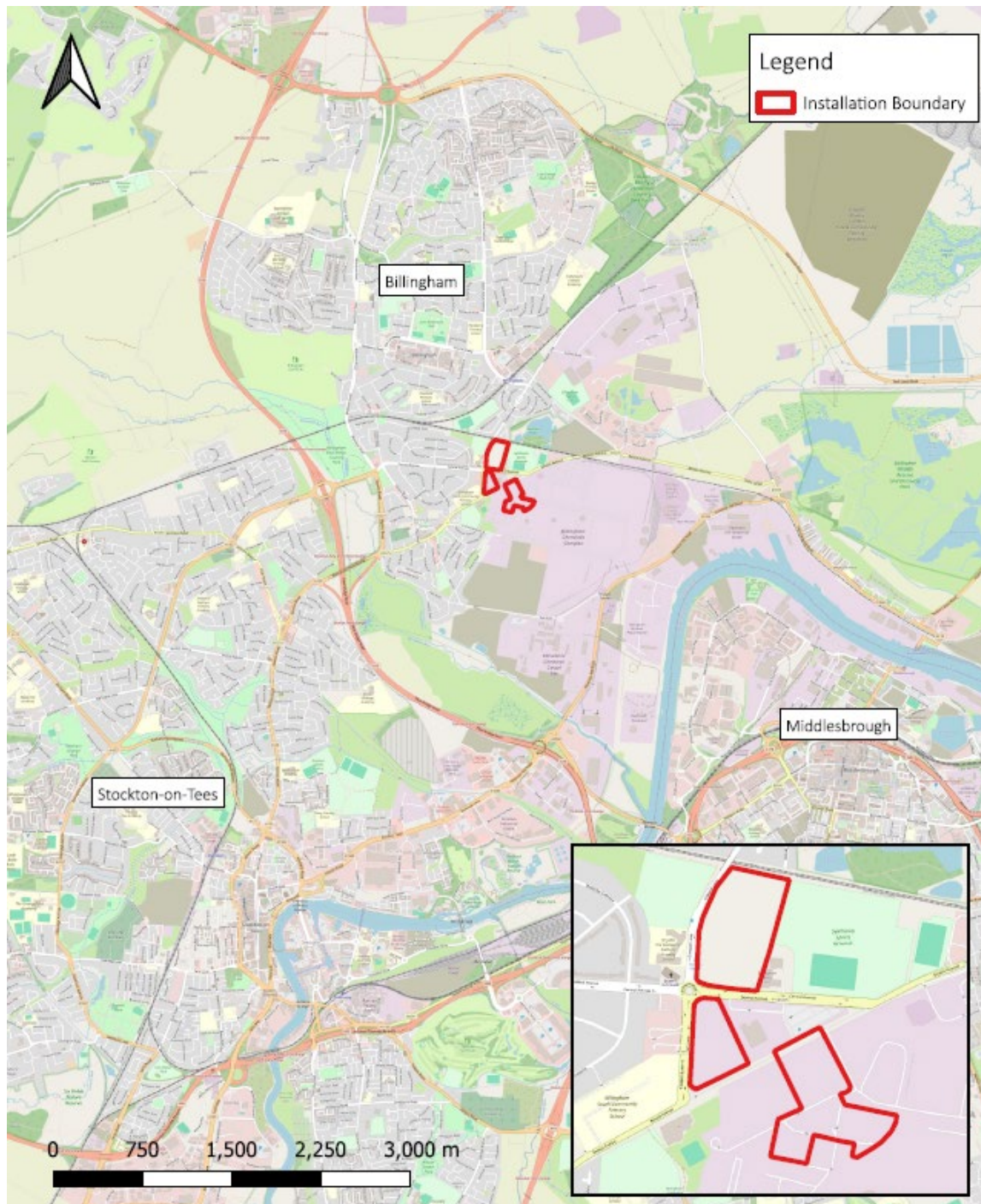


Figure 2.1 – Site Location

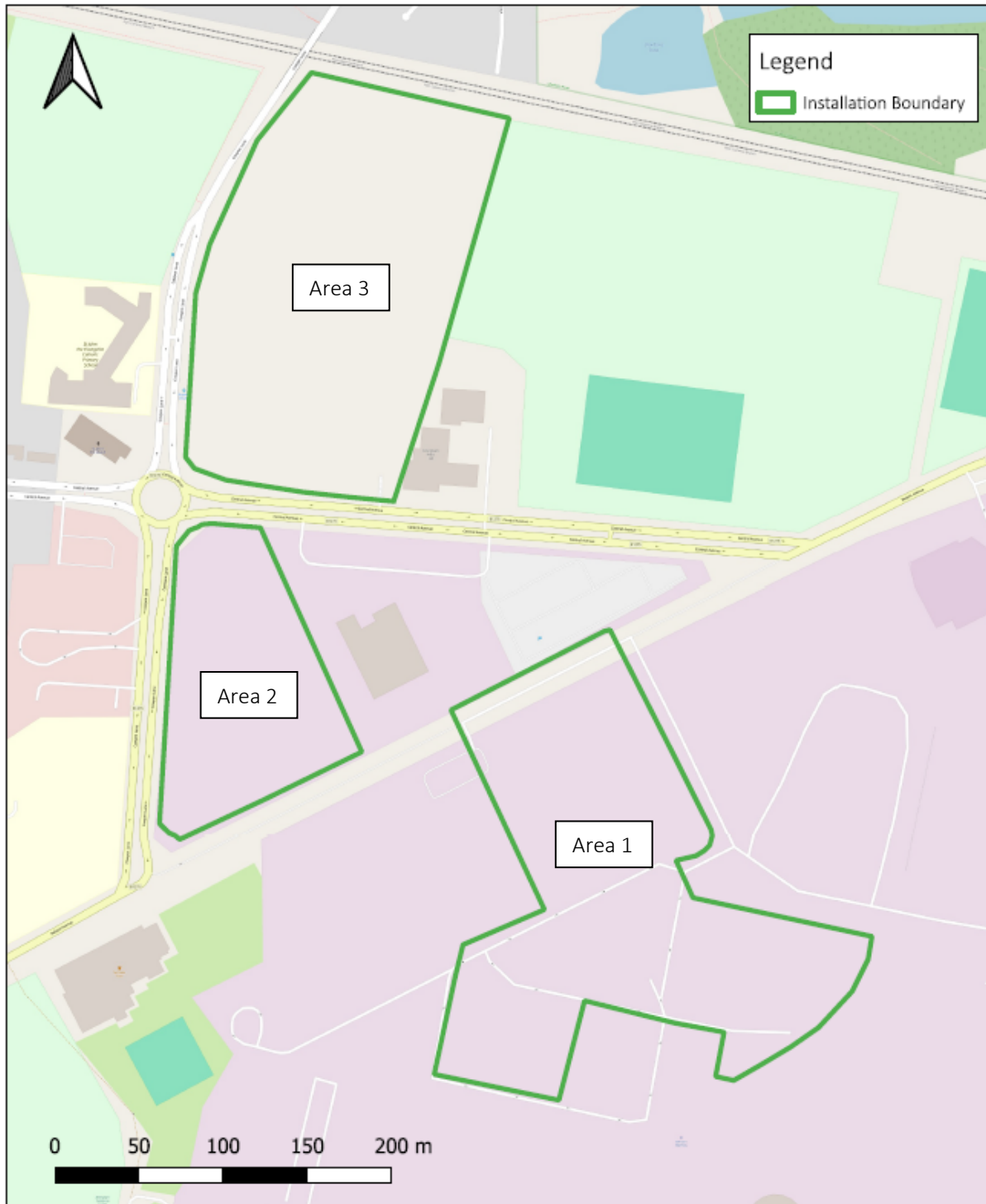


Figure 2.2 – Installation Boundary

2.3 Site Context

The following sections outline the site context, surrounding site setting and any nearby sensitive receptors.

2.3.1 Site Setting

The site is located in a mixed-use landscape, comprising of a blend of industrial, commercial, residential and recreational assets, as well as prominent ecological features. **Table 2.1** outlines the surrounding site setting in greater detail, including features in all four major compass points.

Table 2.1 – Site Setting

Area	Description
Area 1 – Existing permitted area (including the chemical storage area extension)	<ul style="list-style-type: none"> ▪ North – The B1275 (Central Avenue) beyond which Borealis and the Synthonia Sports Ground. ▪ East – Other commercial activities within the Billingham Chemicals Complex. ▪ South – Other commercial activities within the Billingham Chemicals Complex. ▪ West – Other commercial activities within the Billingham Chemicals Complex.
Area 2 – BIC-UK (Laboratory)	<ul style="list-style-type: none"> ▪ North – The B1275 (Central Avenue) beyond which Borealis, the Synthonia Sports Ground, St John the Evangelist Catholic Primary School and residential properties. ▪ East – Offices located outside the permitted boundary but still part of the FUJIFILM Diosynth Biotechnologies UK Limited operations. ▪ South – Other commercial activities within the Billingham Chemicals Complex. ▪ West – Cowpen Lane beyond which is Billingham South Community Primary School and residential properties.
Area 3 – Borealis	<ul style="list-style-type: none"> ▪ North – The Stockton and Darlington railway line (Durham Coast Line) beyond which is residential housing and Charlton’s Pond (Nature Reserve). ▪ East – Synthonia Sports Ground. ▪ South – The B1275 (Central Avenue) beyond which is the existing permitted area. ▪ West – Cowpen Lane beyond which is St John the Evangelist Catholic Primary School and residential properties.

2.3.2 Nearby Sensitive Receptors

The nearest residential areas to the site are on Hereford Terrace, located approximately 30m north of the Borealis site boundary. Numerous other human receptors, including residential receptors, have been identified, and provided on a plan in **Figure 2.3**.

The EA and Local Council websites were researched to locate Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar sites, National Nature Reserves (NNR), Ancient Woodland, Local Nature Reserves (LNR) and Local Wildlife Sites (LWS) also known as Sites of Interest for Nature Conservation (SINCs) within 1 km to 10 km (depending on the site designation) of the Site. The identified designated areas (within the screening distance) are outlined in **Table 2.2** below.

Table 2.2 – Designated Sites

Designation	Screening Distance	Description and Status
Ramsar	10 km	Teesmouth And Cleveland Coast (ID: UK11068)
SPA	10 km	Teesmouth And Cleveland Coast (ID: UK9006061)
SAC	10 km	None
Marine Conservation Zone	10 km	None
SSSI	2 km	Teesmouth And Cleveland Coast
NNR	2 km	None
LNR	2 km	<p>Charlton’s Pond – Charlton's Pond is largely made up of two waterbodies as well as woodland and open-cut grassland. The lake at the site is the largest waterbody in the Borough and includes a restricted area that was designated as a conservation area for birds in 1968. The lake and the smaller pond were originally brick clay extraction pits from the late 1800s.</p> <p>Cowpen Bewley Woodland Country Park – Once a waste disposal site and before that, clay was quarried here and used locally for brick making. It was transformed into a woodland park in the 1990s with the planting of around a quarter of a million trees.</p> <p>Billingham Beck Valley – The low-lying land frequently floods which, in combination with traditional summer hay cutting or grazing, has resulted in a whole host of wildflowers such as meadowsweet, flag iris and valerian. These areas also attract butterflies in the summer, including the meadow brown, common blue and dingy skipper.</p>
Ancient Woodlands	2 km	None
LWS/SINCs	2 km	Air Products Reedbeds (E2 Reedbed) and Norton Bottoms (E2 Reedbed and U1 Urban Grassland).

Due to the proximity of the site to human and ecological receptors, the site could be considered to be moderately sensitive in relation to potential emissions, such as air and noise. However, numerous operational measures for the control and mitigation of emissions have been applied to site to ensure that all potential releases are prevented, therefore reducing this risk.

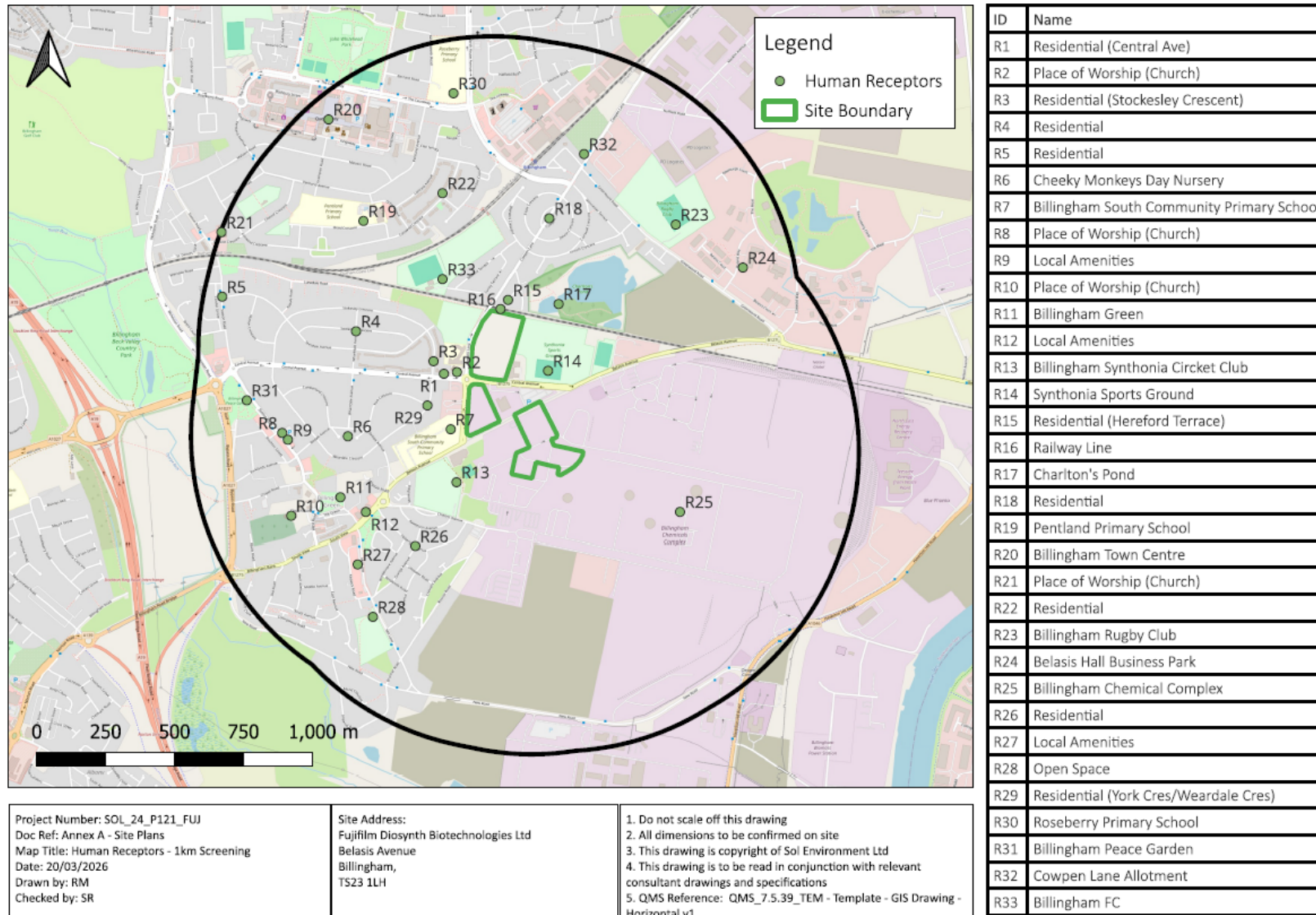


Figure 2.3 – Human Receptors within 1km of the Site

2.3.3 Wind Direction

The estimated wind direction for the proposed site comes from a predominantly south/south westerly direction, based on historic wind direction recordings taken from the Teesside International Airport located approximately 12.5 km southwest of the site.

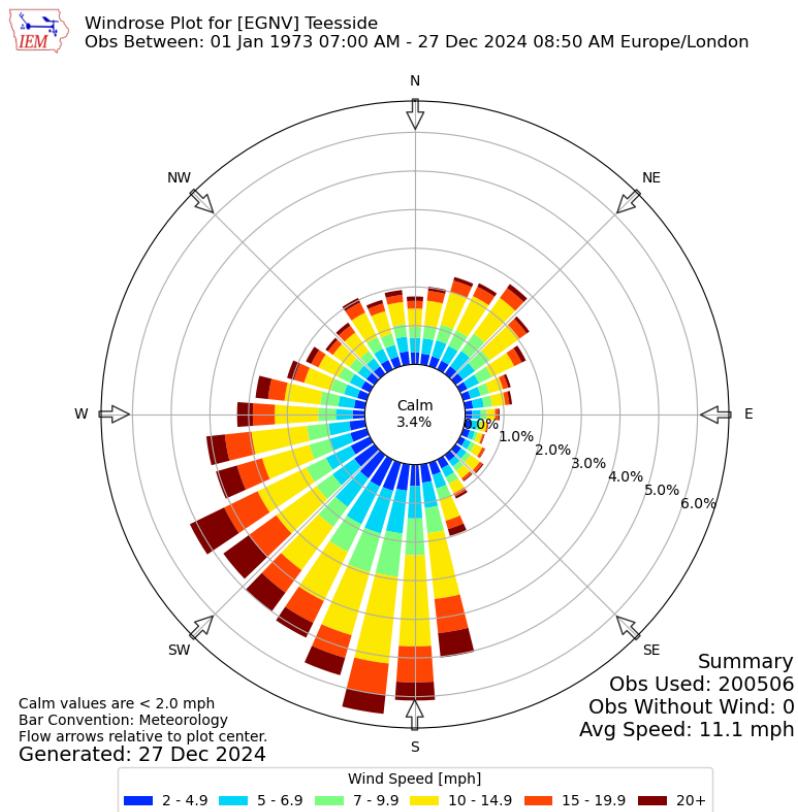


Figure 2.4 – Wind Rose for Teesside International Airport

2.3.4 Flood Risk

The site is situated within Flood Zone 1, meaning the site has a low probability of flooding from rivers, as illustrated in **Figure 2.5**. Flood risk increases to medium between the years 2036 and 2069. This has been accounted for in the site’s Environmental and Climate Change Risk Assessment.

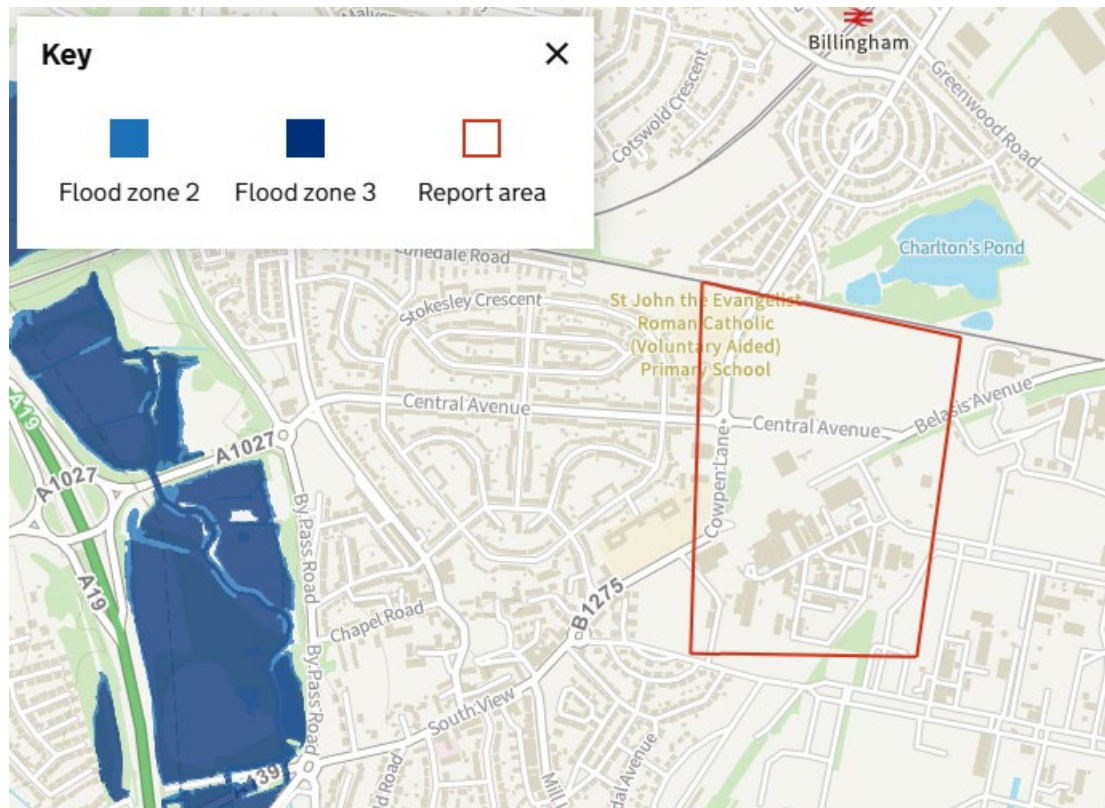


Figure 2.5 – Flood Risk Map (Rivers and the Sea)

3. ENVIRONMENTAL AND CLIMATE CHANGE RISK ASSESSMENT

3.1 Environmental Risk Assessment

Table 3.1 – Environmental Risk Assessment

Hazard	Receptor	Pathway	Probability of Exposure	Risk Management Techniques	Consequence	Overall Risk (following Mitigation)
Emissions to Air	Atmosphere	Airborne	Moderate potential offsite receptor impacts	<ul style="list-style-type: none"> There are currently eight permitted emission points (Emission Points A1 – A8) permitted for the site. Emission points A2, A3, A4 and A7 are being removed from the permit as part of this variation as no longer in use. The permit variation will also be adding a further five emission points to the permit (Emission Points A9 – A13). Emission points A9 – A11 are already existing and operational but have not previously been incorporated into the site permit. As part of the permit variation a review has been undertaken on the existing boiler plant on site against the Medium Combustion Plant Directive. The existing boiler plant (Emission Point A1 and A8) is due to be upgraded to a new unit that provides much higher thermal efficiency and reliability (Emission Point A12 and A13). A full air quality assessment has been carried out which concludes that the predicted annual mean and hourly mean NO₂ concentrations are well below the relevant AQAL at all of the nearby sensitive receptors and the impact of the proposed new boilers on annual mean concentrations is considered to be not significant, in accordance with the Environment Agency Risk Assessment Guidance. In addition to this, the report concludes that the impact of emissions on habitats was assessed as not significant when compared with existing background conditions and relevant critical levels and critical loads. 	Air Pollution	LOW due to the proposed processes and mitigation on site

				<ul style="list-style-type: none"> ▪ The boiler plant will be operated in-line with the permit and the manufacturers requirements to ensure emission limits are not exceeded. ▪ Monitoring will be undertaken at the frequency and methodologies stated in the permit and monitoring reports will be available for submission to the EA as required. ▪ The site is not located within an Air Quality Management Area. ▪ The site has a number of small standby generator plants, two of which are above 1MWth input. Each generator is tested for 1 hour off-load every 2 weeks and 1 hour on-load every 3 months which equates to 30 hours per year. In 2025, the generators were used for approximately 30 hours. Although only operated for 30 hours a year, the two generators which are above 1MWth input (located at building L6 and Borealis) have been included within the updated Air Quality Assessment at the request of the EA. ▪ An H1 screening assessment has been carried out on Emission Point A11 which is in relation to a chemical dispensing booth. ▪ The report concludes that the H1 screening indicates that long-term impacts can be screened out as predicted concentrations (PC) are less than 1% of the EALs or the PECs are less than 70% of the EAL. The H1 screening indicates that short-term impacts can be screened out as predicted concentrations (PC) are less than 10% of the EALs or the PCs are less than 20% of the difference between the EAL and background concentrations. ▪ The other air emission points will not cause an environmental risk from the site and therefore do not need to be considered further. 		
Emissions to Water	Groundwater / Geology / Surface Water	Waterborne	Moderate: potential offsite receptor impacts	<ul style="list-style-type: none"> ▪ The site has an existing connection (Emission Point W1) which allows the discharge of process and cooling water and condensate to controlled waters (The Tees Estuary). This emission point runs to the south of the Billingham site and is shared with CF Fertilisers and a number of other permitted installations within the locality. Emissions to water from site are monitored at the discharge point into the Billingham drain as it enters the CF fertilisers site. 	Contamination	VERY LOW due to the proposed management techniques and drainage arrangements

				<ul style="list-style-type: none"> There will be no amendments to Emission Point W1 as part of this permit application. Monitoring of Emission Point W1 will take place as currently permitted. It is recognised that in the event of a fire, the site does not have the necessary drainage infrastructure to ensure that all contaminated fire water will be contained on site. Therefore, Fujifilm will be carrying out a full review of the sites drainage infrastructure and assess the options to ensure that containment can be achieved in the future. Spill kits are strategically located around site. Minor spills are cleaned up immediately, using spill kits. Resultant materials to be placed in container for off-site disposal to appropriate facility, if necessary. Immediate action to be taken in event of any major spills. Spillage to be cleared immediately and placed in containers for offsite disposal. EA to be informed. 		
Emissions to Sewer	Groundwater / Geology / Surface Water	Waterborne	Moderate potential offsite receptor impacts	<ul style="list-style-type: none"> Currently, there are no emissions to sewer from site. However, the permit variation will be adding two emission points to sewer (Emission Point S1 and S2). All process emissions from the Borealis will be discharged to sewer and requires a new listed emission point to sewer (Emission Point S1). The site has a trade effluent consent for the new discharge. The effluent undergoes treatment within the proposed Water Treatment Plant (pH neutralisation, temperature reduction, bio-inactivation and segregation) prior to discharge. Monitoring of Emission Point S1 will take place as detailed within the effluent discharge consent. An assessment has been carried out using the EA's current H1 assessment tool to assess the impact of Emission Point W1 and Emission Point S1. The results of the screening assessment demonstrate that the indirect discharges (via the sewer) do not pose a significant risk of EQS exceedance in the receiving water body and therefore have passed the H1 assessment. The discharge to sewer from BIC-UK is anticipated to be small and consists mostly of sanitary waste from the various R&D offices (Emission Point S2). 	Contamination	LOW due to the proposed risk management techniques

				<ul style="list-style-type: none"> Further information on this has been provided within the H1 Emission to Water assessment. 		
Emissions to Land	Groundwater / Geology	Spills / Leaks	<p>Low: spills / leaks could potentially contaminate the ground / groundwater underneath the site.</p>	<ul style="list-style-type: none"> There are no emissions to land arising from the facility. All site infrastructure has been constructed in line with the relevant standards. The site operates a sealed drainage system to prevent contamination of discharges to water impact land / ground quality. The majority of the site is covered with well-maintained hardstanding that will prevent contamination should spillages / leakages occur Minor spills to be cleaned up immediately, using spill kits. Resultant materials to be placed in container for off-site disposal to appropriate facility, if necessary. Immediate action to be taken in event of any major spills. Spillage to be cleared immediately and placed in containers for offsite disposal. EA to be informed. Some areas of site contain landscaped areas. These areas are strategically located to allow a portion of the clean, uncontaminated water generated on site to soak away to ground. It is recognised that in the event of a fire, the site does not have the necessary drainage infrastructure to ensure that all contaminated fire water will be contained on site. Therefore, Fujifilm will be carrying out a full review of the sites drainage infrastructure and assess the options to ensure that containment can be achieved in the future. 	Contamination	<p>LOW due to the proposed risk management techniques</p>
Noise	Local Residents	Airborne	<p>Low: due to the nature of the activities</p>	<ul style="list-style-type: none"> The design of the installation has taken into account the potential impacts on the environment and neighbouring receptors with regards to noise. All activities take place within fully enclosed buildings and are inherently quiet in their operation. Doors and windows will be kept shut at all times as to minimise the risk of noise emissions being released and constituting a nuisance The site is located in an industrial area and has no history of any noise complaints. Borealis does have the potential for noise emissions due to a roof-mounted plant room. Therefore, a Noise Impact 	Nuisance	<p>LOW due to the proposed risk management techniques</p>

				<p>Assessment has been produced taking into account the operational impact of the manufacturing facility.</p> <ul style="list-style-type: none"> ▪ The assessment includes a baseline noise survey, undertaken at positions representative of the nearest noise sensitive receptors to determine the typical background noise levels during both daytime and night-time periods. ▪ This report describes the assessment methodology and the baseline conditions currently prevailing across the development site to evaluate the potential noise impact of the development. ▪ Appropriate preventative maintenance will be provided for the various elements of the installation. This will ensure no deterioration of plant or equipment that would give rise to increases in noise. ▪ The site has been designed and operated in accordance with best practice and to ensure that internal noise does not present an issue to the employees at the site under the Control of Noise at Work Regulations and to ensure that noise breakout does not lead to noise nuisance at the identified sensitive receptors. ▪ The facility will not give rise to reasonable cause for annoyance. In the unlikely event that complaints are received measures described in the integrated management system will be put in place. 		
Odour	Local Residents	Airborne	Very Low: the occurrence of odour emissions from the site is unlikely	<ul style="list-style-type: none"> ▪ Due to the design of the site, the fully enclosed processing activities and the nature of the operations carried out on site, there is very little potential for offsite odour emissions and impacts to arise from the site. ▪ In addition, the site is located in an industrial area and has no history of any odour complaints. ▪ There will be no impact in terms of odour from the proposed operations on site. 	Nuisance	LOW due to the proposed risk management techniques
Litter	Local Residents	Airborne	Low: the occurrence of litter on site is highly unlikely therefore the probability of	<ul style="list-style-type: none"> ▪ The site have a documented waste management system on site which manages the risk of litter. ▪ All wastes are fully contained until they are transferred offsite. ▪ Litter will be cleaned up promptly upon detection and any signs of litter will be recorded in the site's daily inspection. 	Nuisance	VERY LOW due to the proposed risk management techniques

			exposure is very low.			
Pests	Local Residents	Airborne & migration	Very Low: due to the nature of the activities and their full enclosure	<ul style="list-style-type: none"> The site's activities are not known to attract pests. The site has a dedicated pest control manager. If a problem does develop, reasonable measures will be taken to use commercially available products and appropriately qualified services to control pests. 	Nuisance	VERY LOW due to the proposed risk management techniques
Vandalism	Operator	The site could be subject to intentional vandalism and damage by intruders / trespassers who could cause damage or harm to the site or cause fires.	Low: the occurrence of vandalism taking place on site is highly unlikely.	<ul style="list-style-type: none"> The site has a CCTV monitoring system and is fully secured with full perimeter fencing. Access card system in operation on site with controlled access turnstiles. There is 24/7 internal Fuji oversight and additional 24/7 on-site security provided by a 3rd party organisation who conduct regular patrols of the site, particularly during out-of-hours. Doors will be kept locked when the site is closed, and security will be in place to monitor the site for signs of access by intruders. All visitors to the site are required to register in the visitor's book and sign out again on exit, thereby minimising the risk of unauthorised visitors on the site. 	Nuisance, Damage or Fire	VERY LOW due to the proposed risk management techniques
Fire	Operator / Residential Properties	Windborne	Medium: the occurrence of a fire taking place on site	<ul style="list-style-type: none"> Arson by intruders is significantly reduced due to the suite of onsite security measures, including perimeter fencing, 24/7 security presence and CCTV monitoring. The site is secured by a full perimeter fence and access gates where appropriate. The site has a regular inspection and maintenance programme which identifies any electrical or mechanical machinery faults which could result in a machinery fire. Machinery is regularly cleaned to remove any dust, etc that may ignite and cause a fire. A number of fire extinguishers are placed at strategic locations around the site. The potential for sparks is regularly monitored by site staff. The risk of damaged or exposed electrical cables is controlled via the regular inspection and maintenance programme. 	Fire / explosion	LOW due to the proposed risk management techniques

				<ul style="list-style-type: none"> ▪ There is a nominated on-site electrical engineer to provide swift repairs and support to damaged or faulty equipment ▪ Staff and visitors are only permitted to smoke within the designated smoking area. There is no smoking permitted within the operational area of the site. ▪ It is recognised that in the event of a fire, the site does not have the necessary drainage infrastructure to ensure that all contaminated fire water will be contained on site. Therefore, Fujifilm will be carrying out a full review of the sites drainage infrastructure and assess the options to ensure that containment can be achieved in the future. 		
Spillages and Leakages	Land, surface water, groundwater	Runoff and percolation	Low: the occurrence of spillages and leakages is unlikely	<ul style="list-style-type: none"> ▪ All infrastructure will be constructed in line with the relevant standards. ▪ All storage areas are located upon impermeable hardstanding with sealed drainage systems. ▪ Appropriate guidance for storage, such as CIRIA 736, is followed on site. ▪ Tanks will be inspected visually on a daily basis by the site staff to ensure the continued integrity of the tanks and identify the requirement for any remedial action. The site manager will be ultimately responsible for ensuring monitoring, inspections and where applicable, maintenance, is carried out. ▪ The site EMS includes a Spill Response Procedure and spill kits are maintained around site. 	Contamination of surface water and/or groundwater	LOW - due to the proposed measures

3.2 Climate Change Risk Assessment

Table 3.2 – Climate Change Adaption Risk Assessment

Hazard	Risk	Vulnerability	Consequence(s)	Risk Management and Adaption Techniques	Likelihood of Occurrence after Adaption	Overall Risk (following Mitigation)
	<p>Summer Daily Maximum Temperature: EA state that 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.</p>					
Impact 1: <i>Potential for odour generation from effluent treatment systems</i>	Moderate The risk is moderate due to some treatment being carried out on site prior to discharge	Moderate Process effluent treatment takes place on site which could potentially generate odour	Effluent does not meet requirements needed to discharge	<ul style="list-style-type: none"> All process effluent treatment is monitored to ensure treatment is taking place sufficiently. All plant is inspected and maintained at all times to ensure it remains in good working order and operates at peak efficiency. If maintenance is required, this will be carried out as soon as reasonably possible. 	Low	Low
Impact 2: <i>Potential for increasing water consumption for cooling water usage</i>	Medium The site relies on cooling waters to lower process temperatures	Medium Water for cooling is essential for the site and may be impacted by warmer temperatures	Excessive waste water generation	<ul style="list-style-type: none"> The site will consider rainwater harvesting as an additional option to reduce reliance on mains water. The site monitors its water usage closely and utilises water-savings measures where possible to reduce consumption whenever possible. Water will be recycled wherever possible as to minimise direct water usage for single use processes. 	Low	Low
Impact 3 - <i>Potential increase in high temperature expansion and stress of plant,</i>	Medium The site utilises critical plant, including associated pipework and fittings that may	Low All processes will be located indoors	Failure of plant and equipment Emission release to the environment	<ul style="list-style-type: none"> Installation of high-integrity plant and equipment at the point of operation ensures minimal risk of failure from thermal stress of expansion. Regular maintenance and inspections are carried out daily on all plant and equipment. 	Low	Low

Hazard	Risk	Vulnerability	Consequence(s)	Risk Management and Adaption Techniques	Likelihood of Occurrence after Adaption	Overall Risk (following Mitigation)
<i>pipework and fittings. UV degradation of plastic pipes and hoses causing them to fail.</i>	be at risk from heat expansion			<ul style="list-style-type: none"> Signs of degradation and / or leakages will prompt quick replacement. All plant is designed to withstand temperature fluctuations and is built with a high-integrity against environmental conditions . 		
Impact 4 - <i>Long periods of hot and dry weather could lead to a drought and may have an impact on water supplies</i>	Medium The site relies on cooling waters to lower process temperatures	Medium Water for cooling is essential for the site and may be impacted by warmer temperatures	Excessive wastewater generation	<ul style="list-style-type: none"> The site will consider rainwater harvesting as an additional option to reduce reliance on mains water. The site monitors its water usage closely and utilises water-savings measures where possible to reduce consumption whenever possible. Water will be recycled wherever possible as to minimise direct water usage for single use processes. 	Low	Low
Impact 5 - <i>Potential increased risk of pests and scavengers</i>	Low The site does not accept any wastes that may attract large quantities of pests	Low The site stores all waste / products internally, minimising access from pests	<p>Potential human-animal contact as pests and scavengers increases</p> <p>Potential for disease introduction to the site</p>	<ul style="list-style-type: none"> Daily checks are conducted to look for signs for pests or scavengers. Pest control to be called at first sign of pests or scavengers. The site has an active contract with Rentokil, who regularly inspect and maintain pest control measures and provide rapid response when required. Maintaining good housekeeping practices to reduce the likelihood of attracting pests. The site will be regularly cleaned. 	Low	Low
Impact 6 - <i>Potential increased risk of wildfires impacting the site.</i>	Low Wildfires are deemed low risk as much of the surrounding area is	Low The site is located in an urbanised area.	Damage to site buildings and / or infrastructure	<ul style="list-style-type: none"> The site is equipped with the necessary shutdown features to ensure safety during emergencies, including during a fire. 	Low	Low

Hazard	Risk	Vulnerability	Consequence(s)	Risk Management and Adaption Techniques	Likelihood of Occurrence after Adaption	Overall Risk (following Mitigation)
	industrialised urban areas			<ul style="list-style-type: none"> The site is manned 24/7, allowing for early detection of wildfire in the surrounding area. The site is well situated to minimise the risk of wildfires causing disruption or damage to the site. 		

Winter Daily Maximum Temperature: EA state that this could be 4°C high than the current average with the potential for more extreme temperatures, both warmer and cooler than present

Impact 1 - Lower winter temperatures could result in an increased risk of pipes (or similar) freezing.	Medium The site utilises critical plant, including associated pipework and fittings that may be at risk from freezing	Low All processes will be located indoors	Failure of plant and equipment	<ul style="list-style-type: none"> Installation of high-integrity plant and equipment at the point of operation ensures minimal risk of failure from thermal stress of expansion. Regular maintenance and inspections are carried out daily on all plant and equipment. Signs of degradation and / or leakages will prompt quick replacement. All plant is designed to withstand temperature fluctuations and is built with a high-integrity against environmental conditions. 	Low	Low
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Daily Extreme Rainfall: EA state that rainfall intensity could increase by up to 20% on today's values

Impact 1: Potential for increased site surface water and flooding.	Low The risk is low as the site is located in Flood Zone 1, considered the lowest possibility of flooding from rivers	Low The site is not particularly vulnerable as the flood risk is low	Damage to the site and its infrastructure Floodwater breaching buildings, causing pollution events	<ul style="list-style-type: none"> Site design has been considered to minimise the risk of flooding. The site operates an existing discharge point (W1) and is managed in accordance with the existing permit. W1 drainages to a shared drain which is managed and maintained by a third-party. Bunding is used in the appropriate areas of site to protect storage areas. If surface water flooding increases in frequency, a flood plan will be 	Low	Low
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Hazard	Risk	Vulnerability	Consequence(s)	Risk Management and Adaption Techniques	Likelihood of Occurrence after Adaption	Overall Risk (following Mitigation)
				prepared to effectively manage these situations.		
Impact 2: <i>There is potential for drainage systems and interceptors to be overwhelmed.</i>	Low The site is considered at a low risk of having its drainage system overwhelmed given its new design	Low The drainage system is well maintained	Surface water flooding from an overwhelmed drainage system	<ul style="list-style-type: none"> See above. 	Low	Low
Average winter rainfall: EA State that the Average winter rainfall may increase by over 40% on today's averages.						
Impact 1: Potential for increased site surface water and flooding.	Low The risk is low as the site is located in Flood Zone 1, considered the lowest possibility of flooding from rivers	Low The site is not particularly vulnerable as the flood risk is low	<p>Damage to the site and its infrastructure</p> <p>Floodwater breaching buildings, causing pollution events</p>	<ul style="list-style-type: none"> Site design has been considered to minimise the risk of flooding. The site operates an existing discharge point (W1) and is managed in accordance with the existing permit. W1 drainages to a shared drain which is managed and maintained by a third-party. Bunding is used in the appropriate areas of site to protect storage areas. If surface water flooding increases in frequency, a flood plan will be prepared to effectively manage these situations. 	Low	Low
Impact 2: <i>There is potential for drainage systems and interceptors to be overwhelmed.</i>	Low The site is considered at a low risk of having its drainage system overwhelmed	Low The drainage system is well maintained and managed	Surface water flooding from an overwhelmed drainage system	See above	Low	Low

Hazard	Risk	Vulnerability	Consequence(s)	Risk Management and Adaption Techniques	Likelihood of Occurrence after Adaption	Overall Risk (following Mitigation)
Sea level rise: The EA state that sea level rise which could be as much as 0.6m higher compared to today's level.						
<i>Impact 1: If located near the coast, a site could experience increased: risk of flooding and associated impacts corrosion due to increase in saltwater spray</i>	Not Applicable					
The site is not located close enough to the coast for this to be an issue.						
Drier Summers: The EA state that summers could see potentially up to 40% less rain than now.						
<i>Impact 1 Long periods of hot and dry weather could lead to a drought and may have an impact on water supplies</i>	Medium The site relies on cooling waters to lower process temperatures	Medium Water for cooling is essential for the site and may be impacted by warmer temperatures	Excessive waste water generation	<ul style="list-style-type: none"> The site will consider rainwater harvesting as an additional option to reduce reliance on mains water. The site monitors its water usage closely and utilises water-savings measures where possible to reduce consumption whenever possible. Water will be recycled wherever possible as to minimise direct water usage for single use processes. 	Low	Low
<i>Impact 2 There is potential increased impact of discharge to watercourse from on-site</i>	Medium The site proposes to discharge process, cooling waters via W1	Medium The site relies on discharges process cooling water as part of its operations	Increased volume of watercourse	<ul style="list-style-type: none"> The site only discharges effluent that meet the requirements specified in the permit. The discharge is continuously monitored for key parameters (flow and pH) to ensure standards are met. Weekly monitoring will be undertaken for COD and Ammoniacal Nitrogen. 	Low	Low

Hazard	Risk	Vulnerability	Consequence(s)	Risk Management and Adaption Techniques	Likelihood of Occurrence after Adaption	Overall Risk (following Mitigation)
<i>drainage systems where connected to water courses.</i>				<p>Discharge will not take place if the requirements cannot be met.</p> <ul style="list-style-type: none"> If water levels are low in the River Tees, as determined by the EA, and discharge is deemed unsafe, the site will consider alternative measures to removing process cooling waters offsite. This may be through the use of a third-party contractor. 		

River Flow: The EA state the flow in the watercourses could be 50% more than now at its peak, and 80% less than now at its lowest.

Impact 1: <i>Increased impact of discharge from on-site drainage systems where they are connected to watercourses.</i>	Medium The site proposes to discharge process, cooling waters to the River Tees via a shared drain	Medium The site relies on discharges process cooling water as part of its operations	Increased volume of watercourse	<ul style="list-style-type: none"> The site only discharges effluent that meet the requirements specified in the permit. The discharge is continuously monitored for key parameters (flow and pH) to ensure standards are met. Weekly monitoring will be undertaken for COD and Ammoniacal Nitrogen. Discharge will not take place if the requirements cannot be met. If water levels are low in the River Tees, as determined by the EA, and discharge is deemed unsafe, the site will consider alternative measures to removing process cooling waters offsite. This may be through the use of a third-party contractor. 	Low	Low
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Storms: Storms could see a change in frequency and intensity. The unique combination of increased wind speeds, increased rainfall, and lightning during these events provides the potential for more extreme storm impacts.

Impact 1 <i>Potential for high winds to damage buildings and</i>	Low The site is of modern construction	Low The site will be considered well designed with	N/A	<ul style="list-style-type: none"> Buildings will be inspected for signs of damage following storms and / or high winds. 	Low	Low
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Hazard	Risk	Vulnerability	Consequence(s)	Risk Management and Adaption Techniques	Likelihood of Occurrence after Adaption	Overall Risk (following Mitigation)
<i>infrastructure and blow waste from the site</i>	and designed to withstand storms and damage from the environment This improves confidence in the rigidity and strength of existing structures to resist damage in high winds	well-constructed buildings and infrastructure		<ul style="list-style-type: none"> Repairs will be undertaken as soon as possible to repair any damage identified following an inspection. Part of the site is existing and has been well-maintained to ensure continued suitability for use. 		
<i>Impact 2 - Potential for high winds to cause problems with stability of above ground storage tanks on jacks. This poses a risk to staff, plant infrastructure and the potential to release the contents of the storage tank.</i>	<p>Not Applicable There is no storage tanks on jacks located on site.</p>					