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Preliminary Environmental Information Report Volume III

Appendix 14-2: Climate Change Risk Assessment

Prosiect Maen Hir - September 2024

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lightsource bp



Table of Contents

14	Introduction	4
14.1	Background.....	4
14.2	Climate Change Risk Assessment.....	4

List of Tables

Table 2-1 Climate change risk assessment - Construction phase

Table 2-2 Climate change risk assessment - Operation phase

Table 2-3 Climate change risk assessment - Decommissioning phase

1 Introduction

1.1 Background

1.1.1 The tables followed summarises the preliminary assessment of climate change risk to the Project. This assessment will be updated in the ES as the design of the Project develops and other assessments such as flood risk assessment are completed.

1.2 Climate Change Risk Assessment

1.2.1 Tables 2-1 to 2-3 present the climate change risks associated with each phase of the Project, from construction through operation (including maintenance) to decommissioning.

1.2.2 The time-period for the initial risk rating of each phase of the Project reflects the period of the obtained climate change projection data (e.g. projections for 2020-2039 cover the estimated construction period of 2026-2028).

1.2.3 Future climate projections have been reviewed and the sensitivity of assets have been examined, initial risks are assessed before commenting on the adequacy of the embedded climate change mitigation measures (as presented in Section 14.3 of Chapter 14: Climate Change) built into the Project.

1.2.4 Identified climate variables are given a significance rating, based upon the likelihood of an impact occurring to the Project and the anticipated consequences. This includes consideration of embedded mitigation measures.

Table 2-1 Climate change risk assessment - Construction phase

RISK IDENTIFICATION							RISK ASSESSMENT									ADAPTATION MEASURES															
Risk ID	Climate variable	Risk statement	Direct or indirect, In-combination	Components impacted			Impact type	Planned Controls	Initial risk rating RCP8.5 (2020-2039)			Initial risk rating RCP8.5 (2040 - 2069)			Initial risk rating RCP8.5 (2070 - 2099)			Justification	Adaptation Measures			Residual risk rating RCP8.5 (2020-2039)			Residual risk rating RCP8.5 (2040 - 2069)			Residual risk rating RCP8.5 (2070 - 2099)			
		Description of impacts		Human Health and Safety	Physical Structures	Utilities	Access	e.g. Asset damage / engineering / operational, Health and safety, Environmental, Social, Financial, Reputation, Cultural	e.g. controls planned within the current design that mitigate the identified risk	Likelihood	Consequence	Risk rating	Likelihood	Consequence	Risk rating	Likelihood	Consequence	Risk rating	Rationale for likelihood and consequences and any changes between climate scenarios	e.g. additional design or operational measures that can be implemented to further reduce the climate risk	Likelihood	Consequence	Risk rating	Likelihood	Consequence	Risk rating	Likelihood	Consequence	Risk rating		
CONSTRUCTION																															
1	Extreme heat event (Increase in summer and annual temperature)	Risk of overheating of construction equipment, resulting in delay, repairs and additional project costs.	Direct					Asset Damage, Financial	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly to manage resources in response to any extreme weather. Construction phase adaptation / resilience measures to be presented in the Construction Environmental Management Plan (CEMP) 	Unlikely	Minor	Low							Projection data suggests that extreme heat is unlikely (Mean max summer daily temperature at RCP 8.5 90th percentile projected to be 19.7°C)	<ul style="list-style-type: none"> Weather forecasts should be monitored so any extreme weather events or expected extreme temperatures are prepared for in advance and contingency measures can be put in place to minimise disruption to operations. Storage facilities for construction equipment to cover equipment from solar radiation. Shading to be provided for equipment/machinery during periods of operation. Construction equipment with superior properties, that offer increased tolerance to high temperatures. 	Rare	Insignificant	Low								
2	Extreme heat event (Increase in summer and annual temperature)	Health and safety risks to the construction force, which could lead to sunstroke and dehydration, or in a worst-case scenario death.	Direct					Health and Safety	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Construction phase adaptation / resilience measures to be presented in the Construction Environmental Management Plan (CEMP) 	Unlikely	Minor	Low							Projection data suggests that extreme heat is unlikely (Mean max summer daily temperature at RCP 8.5 90th percentile projected to be 19.7°C)	<ul style="list-style-type: none"> Weather forecasts should be monitored so any extreme temperatures are prepared for in advance and contingency measures can be in place to minimise disruption to operations. Work schedules should be reflective of weather conditions. Expected periods of high temperatures should have minimal work that's exposed to the sun. E.g., schedule outdoor work to times during the day when the temperature is at its lowest. There should be shaded and indoor cool facilities for staff to get out of the heat, and water provided to help rehydrate. Hydration kits should be provided to those suffering from heat exposure. Ensure correct medical facilities are on site so construction workers can access medical care during periods of extreme heat. Ensure construction workers access appropriate personal protective equipment (PPE) for extreme heat conditions. Establish a 'Heat Stress Prevention Guidelines' procedure during construction. 	Rare	Insignificant	Low								
3	Droughts (Decrease in summer rainfall)	Droughts can lead to water scarcity, impacting the availability of water for construction process and the construction force.	Indirect					Operation; Health and Safety	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Construction phase adaptation / resilience measures to be presented in the Construction Environmental Management Plan (CEMP) 	Rare	Minor	Low							Projection data and ThinkHazard suggests that drought to be rare.	<ul style="list-style-type: none"> Weather forecasts should be monitored so any expected periods of drought are prepared for in advance, and measures can be in place to minimise disruption to the site. 	Rare	Insignificant	Low								
4	Extreme rainfall events (Increase to annual and winter rainfall)	<p>Extreme rainfall event results in onsite flooding causing soil erosion during early works and/or damage to partially constructed infrastructure. It can also cause surface water flooding at the construction site, which can cause disruption and damage to the site.</p> <p>Flooding on the site can result in critical infrastructure becoming damaged, which can increase costs and/or result in programme delays.</p>	Direct					Asset Damage, Financial and Operational	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and receive Environment Agency's flood alerts and plan works accordingly to manage extreme weather conditions such as storms, flooding. Temporary drainage systems will be developed to prevent runoff, identifying all land drains and water features at the Site. Construction phase adaptation / resilience measures to be presented in the Construction Environmental Management Plan (CEMP) 	Unlikely	Moderate	Medium						Projection data suggests that extreme rainfall events to be unlikely.	<ul style="list-style-type: none"> Weather forecasts should be monitored so any expected periods of heavy rainfall are prepared for in advance, and measures can be in place to minimise disruption to the site. Make sure that there is suitable storage for loose materials, such as soil, to protect from high rainfall events during construction. Install suitable drainage at the Site that has the capacity to handle periods of extreme rainfall. Adequate drainage should be installed at the Site to prevent on-site flooding. Consideration should be given to installing a water pump for the areas with critical infrastructure and a key part of construction operations. This will help increase the sites surface drainage capacity. Raise critical infrastructure to be above PMF (Probable maximum flood). Construction materials with superior properties that offer increased tolerance to heavy precipitation and other extreme weather events such as storms, should be used, where feasible. 	Unlikely	Minor	Low									
5	Extreme rainfall events (Increase to annual and winter rainfall)	<p>Extreme rainfall event causes surface water flooding of local roads, limiting or preventing access to the construction site.</p> <p>This affects access to the site, causing potential delays to construction work, potential damage to ground level equipment, and financial loss.</p>	Indirect					Asset Damage, Financial and Operational	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and receive Environment Agency's flood alerts and plan works accordingly with internal methodologies to manage resources in extreme weather conditions such as storms, flooding. Construction phase adaptation / resilience measures to be presented in the Construction Environmental Management Plan (CEMP) 	Unlikely	Moderate	Medium						Projection data suggests that extreme rainfall events to be unlikely.	<ul style="list-style-type: none"> Weather forecasts should be monitored so any extreme weather events or expected extreme temperatures are prepared for in advance and contingency measures can be in place to minimise disruption. 	Unlikely	Minor	Low									

RISK IDENTIFICATION						RISK ASSESSMENT									ADAPTATION MEASURES															
Risk ID	Climate variable	Risk statement	Direct or indirect, In-combination	Components impacted			Impact type	Planned Controls	Initial risk rating RCP8.5 (2020-2039)			Initial risk rating RCP8.5 (2040 - 2069)			Initial risk rating RCP8.5 (2070 - 2099)			Justification	Adaptation Measures			Residual risk rating RCP8.5 (2020-2039)			Residual risk rating RCP8.5 (2040 - 2069)			Residual risk rating RCP8.5 (2070 - 2099)		
		Description of impacts		Human Health and Safety	Physical Structures	Utilities	Access	e.g. Asset damage / engineering / operational, Health and safety, Environmental, Social, Financial, Reputation, Cultural	e.g. controls planned within the current design that mitigate the identified risk	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Rationale for likelihood and consequences and any changes between climate scenarios	e.g. additional design or operational measures that can be implemented to further reduce the climate risk	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	
6	Extreme rainfall events (Increase to annual and winter rainfall)	All types of flooding can result in dangerous working conditions on the site which can pose health and safety risks. E.g. workers can trip on debris that was moved when the site flooded.	Direct	●				Health and Safety	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and receive Environment Agency's flood alerts and plan works accordingly with internal methodologies to manage workers and resources in extreme weather conditions such as storms, flooding. Health and safety plans to be in place. Construction phase adaptation / resilience measures to be presented in the Construction Environmental Management Plan (CEMP) 	Unlikely	Moderate	Medium						Projection data suggests that extreme rainfall events to be unlikely.	<ul style="list-style-type: none"> Weather forecasts should be monitored so any extreme weather events or expected extreme temperatures are prepared for in advance and contingency measures can be in place to minimise disruption to constructions. Adequate drainage should be installed at the Site to prevent on-site flooding. Consideration should be given to installing a water pump for the areas with critical infrastructure and a key part of construction operations. This will help increase the sites surface drainage capacity. 	Unlikely	Minor	Low								
7	Increase in frequency / severity of storm Events	Health and safety risks to the construction workforce and risk of delay in construction due to compromised site access, damaged building equipment and unsafe working conditions during severe weather events.	Direct	●	●			Health and safety, Financial, Asset Damage	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Construction phase adaptation / resilience measures to be presented in the Construction Environmental Management Plan (CEMP) 	Unlikely	Minor	Low						Research undertaken by Palova et al. (2022) indicates that in the RCP 8.5 Scenario, there could be a gradual but not significant increase in storm activity. This implies that storm events are unlikely during the construction period, there is an unlikely (but not impossible) risk of heavy and rain storms during the construction period.	<ul style="list-style-type: none"> Consult the weather forecast to help minimise the risk of workers being on the construction site during periods of storm events as this could lead to damage to equipment and injury to workers. If applicable undertake regular monitoring of trees and large bushes, pruning as necessary to avoid damage to the construction site in the event of a storm with high wind speed. 	Unlikely	Insignificant	Low								
8	Heatwaves (Hotter and drier summers)	Increased heat stress/heat exhaustion for workers	Direct	●				Health and safety	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Construction phase adaptation / resilience measures to be presented in the Construction Environmental Management Plan (CEMP) 	Unlikely	Minor	Low						Projection data suggests that heatwaves is unlikely to occur	<ul style="list-style-type: none"> Weather forecasts should be monitored so any extreme temperatures are prepared for in advance and contingency measures can be in place to minimise disruption to operations. Work schedules should be reflective of weather conditions. Expected periods of high temperatures should have minimal work that's exposed to the sun. E.g., schedule outdoor work to times during the day when the temperature is at its lowest. There should be shaded and indoor cool facilities for staff to get out of the heat, and water provided to help rehydrate. Hydration kits should be provided to those suffering from heat exposure. Ensure correct medical facilities are on site so construction workers can access medical care during periods of extreme heat. Ensure construction workers access appropriate personal protective equipment (PPE) for extreme heat conditions. Establish a 'Heat Stress Prevention Guidelines' procedure during construction. 	Unlikely	Insignificant	Low								
9	Wildfire risk (Hotter and drier summers)	Risk to workers over dry periods	Direct	●				Health and safety	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Construction phase adaptation / resilience measures to be presented in the Construction Environmental Management Plan (CEMP) 	Moderate	Minor	Medium						Projection data and data from ThinkHazard suggested that the wildfires risk is moderate	<ul style="list-style-type: none"> Consult the weather forecast to help minimise the risk of workers being on the construction site during periods of extreme weather condition as this could lead to wildfire risk and damage to equipment and injury to workers. 	Moderate	Insignificant	Low								
10	Increase in frequency / severity of extreme wind events	Health and safety risks to the construction workforce and risk of delay in construction due to compromised site access, damaged building equipment and unsafe working conditions during severe weather events.	Direct	●	●			Health and safety, Financial, Asset Damage	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Construction phase adaptation / resilience measures to be presented in the Construction Environmental Management Plan (CEMP) 	Unlikely	Moderate	Medium						The Met Office has projected an increase in near surface wind speeds over the UK for the second half of the 21st century for the winter season when more significant impacts of wind are experienced. However, the increase in wind speeds is modest compared to natural variability from month to month and season to season, so confidence is low.	<ul style="list-style-type: none"> Consult the weather forecast to help minimise the risk of workers being on the construction site during periods of extreme wind events as this could lead to damage to equipment and injury to workers. If applicable undertake regular monitoring of trees and large bushes, pruning as necessary to avoid damage to the construction site in the event of a storm with high wind speed. 	Unlikely	Minor	Low								

Table 2-2 Climate change risk assessment - Operation phase

Risk ID	Climate variable	RISK IDENTIFICATION				RISK ASSESSMENT									ADAPTATION MEASURES															
		Risk statement	Direct or indirect, In-combination	Components impacted			Impact type	Planned Controls	Initial risk rating RCP8.5 (2020-2039)			Initial risk rating RCP8.5 (2040 - 2069)			Initial risk rating RCP8.5 (2070 - 2099)			Justification	Adaptation Measures			Residual risk rating RCP8.5 (2020-2039)			Residual risk rating RCP8.5 (2040 - 2069)			Residual risk rating RCP8.5 (2070 - 2099)		
				Human Health and Safety	Physical Structures	Utilities			Access	Unlikelihood	Consequence	Risk Rating	Unlikelihood	Consequence	Risk Rating	Unlikelihood	Consequence		Risk Rating	Rationale for likelihood and consequences and any changes between climate scenarios	Unlikelihood	Consequence	Risk Rating	Unlikelihood	Consequence	Risk Rating	Unlikelihood	Consequence	Risk Rating	
		Description of impacts					e.g. Asset damage / engineering / operational, Health and safety, Environmental, Social, Financial, Reputation, Cultural	e.g. controls planned within the current design that mitigate the identified risk										e.g. additional design or operational measures that can be implemented to further reduce the climate risk												
OPERATION																														
11	Extreme heat event (Increase in summer and annual temperature); Heatwaves	Heatwaves result in heat stress for workers, causing health and safety incidents. e.g. sunstroke & dehydration	Direct	●			Health & safety	Contractors will monitor weather forecasts and plan works accordingly to manage any extreme weather conditions.	Unlikely	Minor	Low	Moderate	Minor	Medium	Moderate	Minor	Medium	Projection data suggests that extreme heat is unlikely in short term; moderate in medium- and long-term	<ul style="list-style-type: none"> Weather forecasts should be monitored so any expected extreme temperatures are prepared for in advance and contingency measures can be in place to minimise disruption to operations. Through monitoring the weather forecast maintenance and operational tasks that would be exposed to the hot temperatures can be scheduled or moved to a time period or future date where temperatures will not be as hot. Ensure all outdoor workers have access to indoor facilities, air conditioning, breaks in shaded areas and water breaks. Outdoor workers should have access to adequate PPE. Consult the weather forecast and if there is expected periods of extreme heat, make sure there is sufficient cooling measures available. Case outdoor and non essential work if working conditions are too dangerous, and could result in injury to workers. 	Unlikely	Minor	Low	Moderate	Insufficient	Low	Moderate	Insufficient	Low		
12	Extreme heat event (Increase in summer and annual temperature); Heatwaves	Prolonged periods of extreme heat and heatwaves can lead to an increase in demand for HVAC and cooling equipment for indoor areas. Increase in demand for cooling equipment can lead to increases in operational costs.	Direct	●	●		Financial	Infrastructure is designed to tolerate hot conditions so will not be impacted.	Unlikely	Minor	Low	Moderate	Minor	Medium	Moderate	Minor	Medium	Projection data suggests that extreme heat is unlikely in short term; moderate in medium- and long-term	<ul style="list-style-type: none"> Weather forecasts should be monitored so expected extreme temperatures are prepared for in advance, and contingency measures can be put in place to minimise disruption to operations. Consult the weather forecast and if there is expected periods of extreme heat, make sure there is sufficient cooling measures available. 	Unlikely	Minor	Low	Moderate	Insufficient	Low	Moderate	Insufficient	Low		
13	Extreme heat event (Increase in summer and annual temperature); Heatwaves	Extreme heat affects process machinery efficiency. This results in a potential increased frequency of plant equipment overheating, requiring more frequent maintenance and increased production downtime.	Direct	●			Financial, Asset Damage	Infrastructure is designed to tolerate hot conditions so will not be impacted.	Unlikely	Minor	Low	Moderate	Minor	Medium	Moderate	Minor	Medium	Projection data suggests that extreme heat is unlikely in short term; moderate in medium- and long-term	<ul style="list-style-type: none"> Weather forecasts should be monitored so expected extreme temperatures are prepared for in advance and contingency measures can be in place to minimise disruption to operations. Equipment fitted with cooling systems where necessary, such as air conditioning units. Fire detection and chemical suppressant is built into the BESS Units. 	Unlikely	Minor	Low	Moderate	Insufficient	Low	Moderate	Insufficient	Low		
14	Extreme heat event (Increase in summer and annual temperature); Heatwaves; Wildfire risks	Extreme heat and heatwaves can increase the risk of fires caused by combustible materials. e.g. potential danger for solar batteries to cause or be damaged by wildfire This could result in injury or fatality for workers and people within the vicinity.	Direct	●	●	●	Health and Safety	Operational staff will monitor weather forecasts and plan works accordingly in response to extreme weather conditions. Infrastructure is designed to tolerate hot conditions so will not be impacted. Fire detection and chemical suppressant is built into BESS units	Moderate	Minor	Medium	Moderate	Minor	Medium	Moderate	Minor	Medium	Projection data suggests that extreme heat and heatwaves are unlikely in short term; moderate in medium- and long-term	<ul style="list-style-type: none"> Conduct fire risk assessments. Regularly Conduct assessments to identify potential fire hazards and address them promptly Heat Monitoring: Use temperature Monitoring systems to detect high Heat levels that could lead to fires Proper Storage of combustibles. Store combustible materials in a cool, well-ventilated area away from direct sunlight and equipment Regular Maintenance: Ensure electrical and mechanical equipment are properly maintained to prevent overheating Emergency Response Plan: Develop and communicate a clear emergency response plan for fires during heat waves 	Moderate	Insufficient	Low	Moderate	Insufficient	Low	Moderate	Insufficient	Low		
15	Extreme heat event (Increase in summer and annual temperature); Heatwaves	Extreme temperatures over prolonged periods can lead to shrink-swell subsidence. This can result in damage to infrastructure and weakening of the sites foundation. Weakened infrastructure can result in a higher risk to worker health and safety, as the infrastructure is operating under suboptimal conditions.	Direct	●	●		Health and safety, Financial, Asset Damage	Operational staff will monitor weather forecasts and plan works accordingly in response to extreme weather conditions. Infrastructure is designed to tolerate hot conditions so will not be impacted.	Unlikely	Minor	Low	Moderate	Minor	Medium	Moderate	Minor	Medium	Projection data suggests that risk from extreme heat and heatwaves are unlikely in short term; moderate in medium- and long-term	<ul style="list-style-type: none"> Soil Stabilisation: Implement soil stabilization techniques, which might include the use of polymers, to reduce the shrink-swell capacity of the soil. Landscaping and Drainage. Ensure proper landscaping and drainage around the infrastructure to control soil moisture levels. Regular Monitoring. Set up regular monitoring of the infrastructure to detect early signs of stress or damage. Maintenance Programs Establish proactive maintenance programs to address minor issues before they become major problems. Worker Training Train workers on recognizing signs of infrastructure weakening and the appropriate emergency response actions. Risk Assessments Conduct regular risk assessments to understand the potential impact on infrastructure and workers. Emergency Supports: Install temporary supports for structures identified as at-risk to prevent collapses. Adjust Work Practices: Alter work practices during extreme temperatures to reduce the load on infrastructure. 	Unlikely	Insufficient	Low	Moderate	Insufficient	Low	Moderate	Insufficient	Low		

Table 2-3 Climate change risk assessment - Decommissioning phase

Risk ID	Climate variable	RISK IDENTIFICATION				RISK ASSESSMENT									ADAPTATION MEASURES																											
		Risk statement	Direct or indirect, In-combination	Components Impacted			Impact type	Planned Controls	Initial risk rating RCP8.5 (2020-2039)			Initial risk rating RCP8.5 (2040 - 2069)			Initial risk rating RCP8.5 (2070 - 2099)			Justification	Adaptation Measures			Residual risk rating RCP8.5 (2020-2039)			Residual risk rating RCP8.5 (2040 - 2069)			Residual risk rating RCP8.5 (2070 - 2099)														
		Description of impacts		Human Health and Safety	Physical Structures	Utilities	Access	e.g. Asset damage / engineering / operational, Health and safety, Environmental, Social, Financial, Reputation, Cultural	e.g. controls planned within the current design that mitigate the identified risk	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Rationale for likelihood and consequences and any changes between climate scenarios	e.g. additional design or operational measures that can be implemented to further reduce the climate risk	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating													
DECOMMISSIONING																																										
21	Extreme heat event (Increase in summer and annual temperature); Heatwaves	Heatwaves result in heat stress for workers, causing health and safety incidents. e.g. sunstroke & dehydration	Direct	●				e.g. Asset damage / engineering / operational, Health and safety, Environmental, Social, Financial, Reputation, Cultural	e.g. controls planned within the current design that mitigate the identified risk									Moderate	Minor	Medium	Projection data suggests that extreme heat is unlikely in short term; moderate in medium- and long-term	<ul style="list-style-type: none"> Weather forecasts should be monitored so any expected extreme temperatures are prepared for in advance and contingency measures can be in place to minimise disruption to operations. Through monitoring the weather forecast maintenance and operational tasks that would be exposed to the hot temperatures can be scheduled or moved to a time period or future date where temperatures will not be as hot. Ensure all outdoor workers have access to indoor facilities, air conditioning, breaks in shaded areas and water breaks. Outdoor workers should have access to adequate PPE. Consult the weather forecast and if there is expected periods of extreme heat, make sure there is sufficient cooling measures available. Case outdoor and non essential work if working conditions are too dangerous, and could result in injury to workers. 																Moderate	Insignificant	Low		
22	Extreme heat event (Increase in summer and annual temperature); Heatwaves	Risk of overheating of decommissioning equipment, resulting in delay, repairs and additional project costs.	Direct		●			Asset Damage, Financial	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly to manage resources in response to any extreme weather. Decommissioning phase adaptation / resilience measures to be presented in the Decommissioning Environmental Management Plan (CEMP) 									Moderate	Minor	Medium	Projection data suggests that extreme heat is unlikely in short term; moderate in medium- and long-term	<ul style="list-style-type: none"> Weather forecasts should be monitored so expected extreme temperatures are prepared for in advance and contingency measures can be in place to minimise disruption to operations. Equipment fitted with cooling systems where necessary, such as air conditioning units. Fire detection and chemical suppressant is built into the BESS Units. 													Moderate	Insignificant	Low					
23	Droughts (Decrease in summer rainfall)	Droughts can lead to water scarcity, impacting the availability of water for decommissioning process and the decommissioning force.	Indirect	●	●			Health and safety	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Decommissioning phase adaptation / resilience measures to be presented in the Decommissioning Environmental Management Plan (CEMP) 									Moderate	Minor	Medium	Projection data suggests that risk from extreme rainfalls are unlikely in short and medium term, and moderate in long term	<ul style="list-style-type: none"> There should be an emergency stock supply of potable water stored on the site. Rainwater harvesting and storage should be incorporated into the design, to allow rain to be collected and used during periods of water shortages. 													Moderate	Insignificant	Low					
24	Extreme rainfall events (Increase to annual and winter rainfall)	<p>Extreme rainfall event results in onsite flooding causing soil erosion during early works and/or damage to partially constructed infrastructure. It can also cause surface water flooding at the site, which can cause disruption and damage to the site.</p> <p>Flooding on the site can result in critical infrastructure becoming damaged, which can increase costs and/or result in programme delays.</p>	Direct		●			Asset Damage, Financial and Operational	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and receive Environment Agency's flood alerts and plan works accordingly to manage extreme weather conditions such as storms, flooding. Temporary drainage systems will be developed to prevent runoff, identifying all land drains and water features at the Site. Decommissioning phase adaptation / resilience measures to be presented in the Decommissioning Environmental Management Plan (CEMP) 									Unlikely	Minor	Low	Projection data suggests that extreme rainfall events to be unlikely.	<ul style="list-style-type: none"> Weather forecasts should be monitored so any expected periods of heavy rainfall are prepared for in advance, and measures can be in place to minimise disruption to the site. Make sure that there is suitable storage for loose materials, such as soil, to protect from high rainfall events during decommissioning. Install suitable drainage at the Site that has the capacity to handle periods of extreme rainfall. Adequate drainage should be installed at the Site to prevent on-site flooding. Consideration should be given to installing a water pump for the areas with critical infrastructure and a key part of decommissioning operations. This will help increase the sites surface drainage capacity. Raise critical infrastructure to be above PMF (Probable maximum flood). 																		Unlikely	Insignificant	Low
25	Extreme rainfall events (Increase to annual and winter rainfall)	Extreme rainfall event causes surface water flooding of local roads, limiting or preventing access to the site. This affects access to the site, causing potential delays to decommissioning work, potential damage to ground level equipment, and financial loss.	Indirect		●	●		Asset Damage, Financial and Operational	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and receive Environment Agency's flood alerts and plan works accordingly with internal methodologies to manage resources in extreme weather conditions such as storms, flooding. Decommissioning phase adaptation / resilience measures to be presented in the Decommissioning Environmental Management Plan (CEMP) 										Unlikely	Minor	Low	Projection data suggests that extreme rainfall events to be unlikely.	<ul style="list-style-type: none"> Weather forecasts should be monitored so any extreme weather events or expected extreme temperatures are prepared for in advance and contingency measures can be in place to minimise disruption. 														Unlikely	Insignificant	Low			

RISK IDENTIFICATION							RISK ASSESSMENT									ADAPTATION MEASURES																		
Risk ID	Climate variable	Risk statement	Direct or indirect, In-combination	Components Impacted			Impact type	Planned Controls	Initial risk rating RCP8.5 (2020-2039)			Initial risk rating RCP8.5 (2040 - 2069)			Initial risk rating RCP8.5 (2070 - 2099)			Justification	Adaptation Measures			Residual risk rating RCP8.5 (2020-2039)			Residual risk rating RCP8.5 (2040 - 2069)			Residual risk rating RCP8.5 (2070 - 2099)						
		Description of impacts		Human Health and Safety	Physical Structures	Utilities	Access	e.g. Asset damage / engineering / operational, Health and safety, Environmental, Social, Financial, Reputation, Cultural	e.g. controls planned within the current design that mitigate the identified risk	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Rationale for likelihood and consequences and any changes between climate scenarios	e.g. additional design or operational measures that can be implemented to further reduce the climate risk	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating	Likelihood	Consequence	Risk Rating					
26	Extreme rainfall events (Increase to annual and winter rainfall)	All types of flooding can result in dangerous working conditions on the site which can pose health and safety risks. E.g. workers can trip on debris that was moved when the site flooded.	Direct	●				Health and Safety	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and receive Environment Agency's flood alerts and plan works accordingly with internal methodologies to manage workers and resources in extreme weather conditions such as storms, flooding. Health and safety plans to be in place. Decommissioning phase adaptation / resilience measures to be presented in the Decommissioning Environmental Management Plan (DEMP) 	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Projection data suggests that risk from extreme rainfalls are unlikely	<ul style="list-style-type: none"> Weather forecasts should be monitored so any extreme rainfall events are prepared for in advance and contingency measures can be in place to minimise disruption to operations. An Early Warning System should be developed to help provide workers sufficient time to retreat from high risk flood areas. An Emergency Response Plan should be developed for extreme rainfall events during heat waves 														
27	Storm Events	Health and safety risks to the decommissioning workforce and risk of delay in decommissioning due to compromised site access, damaged building equipment and unsafe working conditions during severe weather events.	Direct	●	●			Health and safety, Financial, Asset Damage	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Decommissioning phase adaptation / resilience measures to be presented in the Decommissioning Environmental Management Plan (DEMP) 	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Projection data suggests that risk from extreme storm events are unlikely	<ul style="list-style-type: none"> Consult the weather forecast to help minimise the risk of workers being on site during periods of extreme storm events as this could lead to damage to equipment and injury to workers. Cease outdoor and non essential work if working conditions are too dangerous, and could result in injury to workers. 														
28	Wildfire risk (Hotter and drier summers)	Risk to workers over dry periods	Direct	●				Health and safety	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Decommissioning phase adaptation / resilience measures to be presented in the Decommissioning Environmental Management Plan (DEMP) 	Moderate	Minor	Medium	Moderate	Minor	Medium	Moderate	Minor	Medium	Projection data suggests that extreme heat and heatwaves are unlikely in short term; moderate in medium- and long-term	<ul style="list-style-type: none"> Conduct fire risk assessments. Regularly Conduct assessments to identify potential fire hazards and address them promptly Heat Monitoring: Use temperature Monitoring systems to detect high Heat levels that could lead to fires Proper Storage of combustibles. Store combustible materials in a cool, well-ventilated area away from direct sunlight and equipment Regular Maintenance: Ensure electrical and mechanical equipment are properly maintained to prevent overheating Emergency Response Plan: Develop and communicate a clear emergency response plan for fires during heat waves 														
29	Increase in frequency / severity of extreme wind events	Health and safety risks to the decommissioning workforce and risk of delay in decommissioning due to compromised site access, damaged building equipment and unsafe working conditions during severe weather events.	Direct	●	●			Health and safety, Financial, Asset Damage	<ul style="list-style-type: none"> Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Decommissioning phase adaptation / resilience measures to be presented in the Decommissioning Environmental Management Plan (DEMP) 	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Projection data suggests that risk from extreme wind events are unlikely	<ul style="list-style-type: none"> Consult the weather forecast to help minimise the risk of workers being on site during periods of extreme wind events as this could lead to damage to equipment and injury to workers. Cease outdoor and non essential work if working conditions are too dangerous, and could result in injury to workers. 														

