

1 Non-Technical Summary

1.1 Background to the proposed development

- 1.1.1 The Rhymney River is designated as a Site of Importance for Nature Conservation (SINC) and is one of the main rivers that runs through Cardiff, South Wales, starting in Rhymney, located just south of the Brecon Beacons national Park. When it reaches Cardiff, it flows along a wide, meandering course towards its confluence with the Severn Estuary. The Severn Estuary is one of the largest estuaries in Britain located between south Wales and southwest England. The Estuary is protected by UK legislation having been designated as a Special Conservation Area (SAC), Special Protection Area (SPA), Ramsar Site, and as a Site of Special Scientific Interest (SSSI) for a range of habitats and species.
- 1.1.2 In the past, flood defences were built along the Severn Estuary and part-way up the River Rhymney. These defences included rock armour revetments, a sheet-pile wall, earth embankments and blockstone defences. Today, these defences are severely eroded from tidal and fluvial forces and in some parts completely lost. The remaining defences are at significant risk of failure in the near future and no longer provide flood protection especially with sea level rise predictions.
- 1.1.3 The proposed scheme is to improve and extend the coastal and fluvial defences along the coastline between the Dwr Cymru Welsh Water (DCWW) Cardiff East Waste Water Treatment Works (WWTW) to the west and the eastern extent of the Lamby Way landfill site to the east (see Figure 1 below). It is anticipated that the project will prevent breaches of the existing defences and reduce erosion and flooding of critical transport, waste management, and energy infrastructure located immediately landward of the scheme. It will also protect extensive residential and commercial areas in the surrounding hinterland.
- 1.1.4 An Environmental Impact Assessment (EIA) is required for some construction projects when it is thought that they could cause significant environmental effects. The Environmental Impact Assessment identifies, predicts and evaluates the possible environmental effects of the proposed development. The findings of the Environmental Impact Assessment are then presented in an Environmental Statement. This document is the Non-Technical Summary of the Environmental Statement, which explains the findings of the Environmental Statement in non-technical language.

1.2 Description of the development site

- 1.2.1 The proposed development is comprised of new fluvial and coastal flood defences along both banks of the River Rhymney from where the A4232 crosses the river down to the confluence between the river and the Severn Estuary. The defences will then extend along the Severn Estuary coastline, east and west from the River Rhymney. This area includes the DCWW Cardiff East WWTW and the eastern extent of the Lamby Way landfill site (see Figure 1).
- 1.2.2 The scheme extends over an area of approximately 40ha. To the west of Rhymney River, landward of Rover Way road, land use is a mix of open land, residential land, commercial land, and industrial land. Rover Way itself runs parallel to the coastline and along the eastern bank of the river. It is an important transport route, linking Cardiff city centre with the eastern suburbs of the city and the A48. Along the coastline, west of Rover Way, the Celsa steelworks plant is situated with the adjacent area being used for storage of the waste generated by the plant. On the opposite side of Rover Way, on the Frag Tip, there is a motocross track, while DCWW Cardiff East WWTW is located further south along the road.

- 1.2.3 To the east of the river Rhymney, Lamby Way landfill extends along the eastern bank of the river and is boarded by Lamby Way to the north. The site has been remediated and landscaped with the majority of the land being developed as a solar farm by Cardiff Council.
- 1.2.4 The Rhymney River Motor Boat, Sail & Angling Club is located on a narrow bankside area on a large meander of the river close to its confluence with the Severn Estuary. Extensive areas of saltmarsh habitat are located on bankside areas immediately downstream, which provide high-tide roosting for a large number of wintering birds.
- 1.2.5 The Rhymney River flows along a wide, meandering course from the mainline railway line southwards to its confluence with the Severn Estuary. The channel is approximately 80m wide and contains extensive inter-tidal mudflats exposed at low tide. The Severn Estuary in this area contains a wide, shallow foreshore area, comprising extensive areas of inter-tidal mudflat and smaller areas of fringing saltmarsh habitat. Along the foreshore west of the river, immediately adjacent to higher ground, is a wide area of rocky rubble material, including remnants of building waste (e.g., bricks, slabs, concrete, rebar, etc) that is likely to have been eroded from the Frag Tip. To the east of the river, a rocky substrate is again present in the foreshore area adjacent to higher ground and includes the remnants of earlier rock revetment defences that have failed and eroded.



Figure 1: Location of Rhymney River and its confluence into the Severn Estuary with key features.

- 1.2.6 The defences along the Severn Estuary coastline to the west of the Rhymney River are in very poor condition with erosion occurring at a rapid rate. This is causing landfill material to be deposited into the Severn Estuary from the disused Frag Tip and the Traveller site to be at risk of erosion. Along the riverbank, sea level rise is predicted to cause overtopping of the existing defences causing increased flood risk to properties and key infrastructure. In addition, the Lamby Way roundabout and Rover Way and associated utilities are at risk of being undermined and lost to erosion within 20 years.
- 1.2.7 The defences along the east bank of the river and along the coastline to the east of the Rhymney River are also at risk of erosion. It is predicted that erosion will increase and impact upon the disused Lamby Way Landfill within 20 years causing landfill material to be released into the Severn Estuary if preventative works are not undertaken. Due to the land elevations being higher on this side of the river the risk of erosion is up to 50m along the coast within 20 years, and 270m by 2117.

1.3 Description of the proposed development

- 1.3.1 The proposed development is anticipated to manage flood risk to 2,326 residential and 204 non-residential properties for over 100 years, as well as preventing erosion of landfill material, key road/rail infrastructure, and the Rover Way Traveller Site. The project is being taken forward by Cardiff Council with support from Welsh Government.
- 1.3.2 The scheme has been split into various 'Locations'. Rock armour revetement is proposed at Locations 11 and 12 on the coast. Improvements to earth embankments are proposed at Locations 22, 42 and 52. Hybrid erosion protection (including elements of bio-engineering along with concrete erosion protection) is proposed in the remaining locations – Locations 21, 31 and 32. The scheme locations are shown in Figure 2 below.

1.4 Construction of the proposed development

- 1.4.1 The following section provides a high-level construction methodology. Construction is programmed to take approximately 18 months to 2 years to complete and commence in early spring 2022.

Construction access

- 1.4.2 Access for all vehicle types to the west of Rhymney River will be via Rover Way initially and then via an existing access point onto the Frag Tip/motocross track to the west of the Traveller's site.
- 1.4.3 Access to the east of Rhymney River will be directly from Lamby Way or by turning off onto the existing vehicular entrance to Lamby Way Landfill. The construction vehicles will then access the river sections and Severn Estuary coastline via an existing vehicular access track across the landfill.
- 1.4.4 To access the construction areas north of the Lamby Way road bridge, vehicles will enter via a new access created off Lamby Way or via an existing vehicular route through the StarGarAllot Community Garden (Pengham allotments).
- 1.4.5 Most construction materials i.e., sheet piles, earth, etc, will be brought to the construction site via the existing highway network (primarily via Rover Way). Rock will be brought to the site by road.

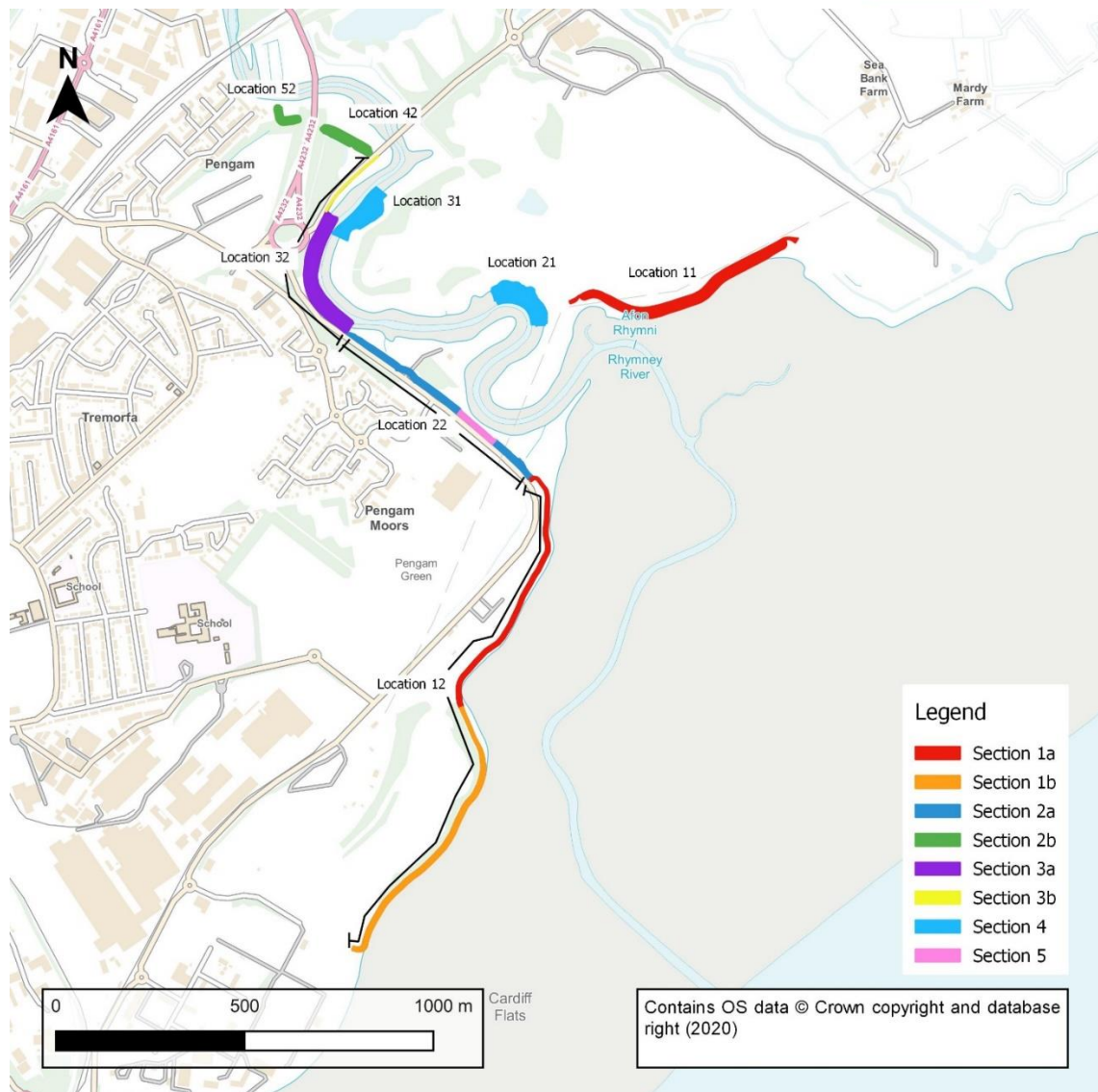


Figure 2: Overview of the proposed locations and development sections.

Construction traffic management

- 1.4.6 To enable certain works at Location 32, namely sheet piling adjacent to the A4232/Lamby Way/Rover Way roundabout, sufficient room will need to be provided in order to create a safe working zone/segregation area between the works and live traffic. This could be achieved by reducing the width of the central roundabout island and installing a temporary running surface to accommodate single width traffic. This may also involve taking up a section of the western verge of Lamby Way to provide a temporary running surface to move the north bound traffic, providing more traffic space. This would enable two lane traffic to be maintained throughout the construction period. This solution is possible as long as the temporary surface is no narrower than 3m wide in order to accommodate HGVs.
- 1.4.7 Should it not be feasible to reduce lane widths work at this location would be carried out in the off-peak hours between 9.30 am and 3.30 pm to ensure minimal disruption to traffic.
- 1.4.8 A detailed construction traffic management plan will be prepared prior to construction.

Construction site boundary

1.4.9 The construction site boundary for the proposed development is shown in Figure 3. This includes the footprint of the permanent works, the areas needed to accommodate construction compounds and storage facilities, and the construction access routes from the public highway to be used to facilitate access for construction plant, vehicles and staff.

1.4.10 The total area contained within the site boundary extends to approximately 37ha.

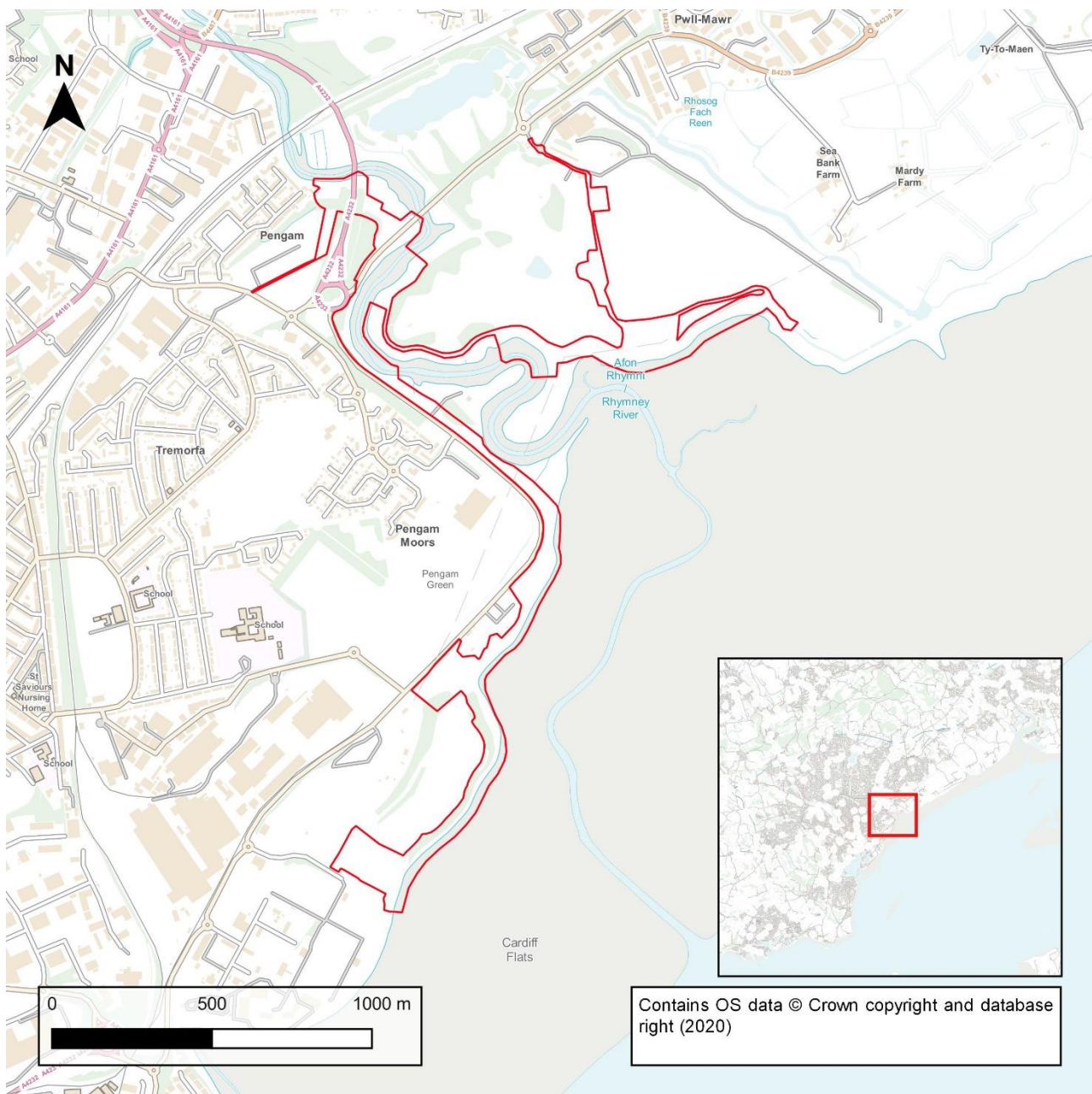


Figure 3: Proposed construction site boundary.

1.5 Operation of the proposed development

- 1.5.1 The scheme will manage and reduce erosion along the coast to reduce the risk of failing coastal flood defences and the release of contaminated landfill material into the Severn Estuary from Lamby Way Tip and the Rover Way Frag Tip, in the immediate future and over the next 100 years. It will also reduce and manage the flood risk to 2,842 residential properties and 291 commercial properties over the same period.
- 1.5.2 Given the hard-engineered composition of the scheme the structure would require minimal maintenance over the 100-year design life of the scheme. Apart from occasional patch repairs, vegetation management and bi-annual condition assessments, it is unlikely that there would be any significant maintenance requirements during operation of the scheme.

1.6 Summary of potential environmental impacts of the proposed development

Water environment

Potential impacts and proposed mitigation measures

Construction Impacts

- 1.6.1 The construction of the defences will take place either above tidal areas or under dry conditions. No material will be stored on the foreshore. The works will therefore have No Significant Effect upon the local hydrodynamic regime.
- 1.6.2 There is a limited risk that works at some locations may mobilise beach sediment into the sea. Any resulting sediment mobilisation during excavation is considered to be fairly minor in the context of high levels of suspended sediment within the Severn Estuary (approximately 30 million tonnes on a spring tide) and highly unlikely to cause permanent or temporary sediment plumes. Therefore, it is considered that the construction of the defences will have No Significant Impact on the sediment regime of the River Rhymney and the wider Severn Estuary.
- 1.6.3 As the majority of works are located out of the tidal zone, there are unlikely to be any indirect geomorphological impacts on intertidal habitats during construction. Therefore it is considered that the construction of the defences will have No Significant Effect on intertidal habitat within the estuary, through indirect geomorphological processes.

Operational impacts

- 1.6.4 Due to the majority of the defences being located above tidal areas, the limited wave action within the Rhymney and the design of the defences, it is considered that the defences have a low impact score on local hydrodynamics. In addition, the coastal processes are of low sensitivity. Thus, it is considered that the operation of the defence will have No Significant Effect on hydrodynamics within the estuary.
- 1.6.5 Dycel Block scour protection at some locations will cut off the intertidal bank from the sediment budget of the Severn Estuary. However, due to the small footprint of the defences, any sediment affected will represent a negligible contribution to the overall suspended sediment load of the Severn Estuary. It is therefore unlikely that operation of the defences will have any effect on the sediment regime in the Rhymney or the wider estuary.
- 1.6.6 Due to the anticipated minimal impact upon the sediment regime by the defences, it is also considered unlikely that the construction of the defences will have any effect on intertidal habitat within the estuary through geomorphological processes.

Mitigation Measures

- 1.6.7 Potential coastal process impacts would be mitigated through the adoption of good construction practices. As much work as possible will be non-tidal (i.e. undertaken above the Mean High Water Springs (MHWS) level or during periods that allow for dry working).
- 1.6.8 No material would be stored on the foreshore, to reduce the risk of scour to adjacent intertidal habitat.

Biodiversity and nature conservation

Baseline conditions

- 1.6.9 The Severn Estuary European Marine Site (EMS) is designated as a SPA, SAC, and Ramsar site, with a further six statutory designated sites located within 5km of the proposed development. In addition to the statutory designated sites, there are five non-statutory designated sites located within 1km of the proposed development. These are referred to as Sites of Importance for Nature Conservation (SINCs).

Potential impacts and proposed mitigation measures

Protected sites

- 1.6.10 During construction, there is potential to impact upon the features of the Severn Estuary European Marine Site. Construction may disturb wintering wildfowl and wading bird species, if the works are carried out during the wintering period. Plant movement has the potential to negatively impact intertidal habitats through compaction of the foreshore. In addition, there is the potential to negatively impact intertidal and subtidal habitats through pollution incidents.
- 1.6.11 During operation, there is potential for the defences to cause coastal squeeze. It is estimated the total intertidal habitat lost as a result of the scheme to be 1.75 Ha.

Habitats

- 1.6.12 The permanent works footprint will directly impact approximately 1.41ha of intertidal habitat in the Severn Estuary and 0.94 ha of intertidal habitat in the Rhymney River. The scheme will directly impact 1.59 ha of saltmarsh and has the potential to further impact saltmarsh and intertidal mudflats in the Rhymney and the Severn through the provision of access tracks and site compounds

Birds

- 1.6.13 During construction, there is the potential to disturb these wintering wildfowl and wading bird species should the project impact upon the foreshore areas. Additionally, re-routing the Wales Coast Path either temporarily or permanently has the potential to disturb wintering and migratory birds if the path results in walkers breaking the skyline. However, no change to the route of the Path is proposed.

Mitigation

- 1.6.14 Any habitat lost as a result of the defence footprint and coastal squeeze will be replaced with compensatory habitat.

Landscape and visual

- 1.6.15 Much of the site lies on the edge of National Landscape Character Area 35, Cardiff, Barry and Newport. Part of the site lies on the far western edge of National Landscape Character Area 34, Gwent Levels. The site is also just to the west of The Gwent Levels, a Registered Landscape of Outstanding and of Special Interest in Wales. This has been designated due to its extraordinarily diverse environmental and archaeological potential. The site is part of Marine Character Area 29 Severn Estuary (Wales).

Potential impacts and proposed mitigation measures

- 1.6.16 During the construction phase, there will be slight effects to landscape features and landscape character due to the operation of machinery and excavation of landscape features including the riverbanks and channel. There will be moderate impacts upon the coastal area resulting from significant increases in noise pollution during construction activities. This disturbance will also have a moderate-substantial adverse impact on receptors on the Wales Coast Path (WCP) and Public Rights of Way (PRoW).
- 1.6.17 During the operational phase there will be slight beneficial impacts upon the coastal area due to an improvement in the appearance of man-made coastal defences. The defences will have a slight adverse effect upon the river, although these impacts will reduce once mud begins to accrete on the surface. There will continue to be slight-moderate adverse effect upon trees as colonisation of the bare earth will take time.
- 1.6.18 After 15 years, the accretion of mud will have helped blend the defences into the natural environment, thus the visual impact on the river will be negligible. Trees will have grown in stature by this stage and thus the visual impact will reduce. Impacts upon urban areas will be negligible.
- 1.6.19 Residents of the Traveller site on Rover Way will continue to be able to see walkers on the WCP/PRoW, though this may have reduced slightly over time with some natural vegetation growth along the boundary between the site and the coast. Effects on most other receptors at this point are likely to be negligible.

Mitigation measures

- 1.6.20 The mitigation options are likely to be limited during the construction period and will rely on good construction practices to limit the disturbance to landscape and visual receptors. Advance seeding/planting may be possible in certain areas to help to minimise any adverse effects during this phase.

The Queen's Gate Roundabout

- 1.6.21 Trees and vegetation lost in this area during the works will be replaced with new planting that is designed to integrate with the species that remain, to provide visual interest, and to provide some screening of the busy road network for those using the WCP/PRoW. The planting will make a positive contribution to the overall landscape character of the area.

The Traveller Site

- 1.6.22 There will be planting to provide a natural screen between the Traveller Site and the WCP/PRoW. By Year 15 in winter the new planting will be providing an improvement to the baseline with visual interest, as well as acting as a visual screen, and adding a positive landscape feature to the landscape character in this area.
- 1.6.23 In addition, a privacy fence will be installed between the Traveller site and the

WCP/PRoW so that walkers on the footpath cannot be seen by the residents, and vice versa.

Historic environment

Baseline conditions

- 1.6.24 Designated heritage assets include World Heritage Sites, Scheduled Monuments, Listed Buildings, Conservation Areas, Protected Wreck Sites, Registered Parks and Gardens and Registered Battlefields. There are no designated heritage assets within the study area.
- 1.6.25 The wider study area contains several designated heritage assets, but none of these will be significantly affected by the scheme. The known assets include:
- The Grade II listed Rumney Pottery, approximately 400m north-west of the site;
 - Three conservation areas: Roath Mill Gardens, Roath Park and Oakfield Street are all located between 1.3km-1.8km to the west of the site. All of the conservation areas contain Grade I and II Listed Buildings;
 - The Relict Seawall on Rhymney Great Wharf located c.800m to the east of the site extent and is a Scheduled Monument; and
 - The Gwent Levels.

Potential impacts and proposed mitigation measures

- 1.6.26 There will be no direct or indirect impacts on any designated heritage assets as a result of the proposed works.
- 1.6.27 Mitigation of impacts to these assets will involve fencing to protect from vehicle movements or accidental damage during construction. The type of fencing and buffer distance around the assets will be confirmed prior to construction beginning.
- 1.6.28 Groundbreaking at some locations will be through tidal flat deposits. There is a risk of encountering unknown archaeological remains in these deposits.
- 1.6.29 It is recommended that any further pre-construction ground investigation works are monitored and the results analysed to further determine the potential for encountering unknown archaeological remains and palaeoenvironmental deposits.
- 1.6.30 The operation of the proposed scheme will have a neutral impact upon the setting of the Gwent Levels. During the construction phase, however, vehicle movements along access routes and on the foreshore, plant activity and storage of materials will have a temporary minor impact upon the setting of the Gwent Levels.

Climate Change

Future Baseline

- 1.6.31 UKCP18 climate projections predict:
- A move towards warmer, wetter winters and hotter, drier summers;
 - Increases in wind speeds over the UK for the second half of the 21st century for the winter season; and
 - An increase in UK coastal flood risk under all emission scenarios, generally due to the effects of sea level rise and an increase in the frequency and magnitude of severe weather events.

During Operation

- 1.6.32 A climate emergency plan and procedure will need to be developed by the operator that includes a plan and risk assessment for each of the potential climate hazards that could impact the operation of the defences.
- 1.6.33 Additional mitigation measures that may be relevant to the operation includes the development of a detailed monitoring regime for the flood defence. Included as part of this would likely be:
- Ensuring a full inspection of the assets is completed following any storm event/adverse weather, checking for any damage to the assets.
 - Repairing any damage found on the assets as quickly as possible to minimise any adverse effects resulting from additional adverse weather.

1.7 Conclusions of the environmental impact assessment

- 1.7.1 The main environmental impact of the scheme will be disruption to and a permanent loss of some of the River Rhymney mudflats due to installation of concrete erosion protection. The amount of loss has been minimised by restricting the lengths of the river bank that are to be protected and including bio-engineering options for erosion control. Over time it is hoped that the existing mud habitat will re-establish along this section of the Rhymney.
- 1.7.2 At Locations 11 and 12 the existing shorelines will be replaced with rock armour, changing the character of these areas and resulting in the loss of small areas of saltmarsh. However, the rock armour will provide erosion protection to this section of coast.
- 1.7.3 Construction will result in a change to local landscape character and an impact on local views for local residents and those using the Wales Coast Path. Replacement planting will be undertaken to replace trees and scrub affected by construction of the scheme.

Construction environmental management

- 1.7.4 An Outline Construction Environmental Management Plan will be produced to assist with the implementation of construction mitigation identified in the Environmental Statement. It will include the key environmental management recommendations identified for the construction phase of the Cardiff project in the Environmental Statement.

