MOTT MACDONALD

Colwyn Bay Waterfront Phase 2b

Environmental Impact Assessment (EIA) Scoping Report

March 2021

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Contents

1 Introduction

1.1 Overview

This Environmental Impact Assessment (EIA) Scoping Report has been prepared on behalf of Conwy County Borough Council (CCBC) Environment, Roads and Facilities Team (hereafter referred to as 'the Applicant') to accompany a request for an EIA Scoping Opinion. It sets out the proposed scope of the EIA to be undertaken in respect of the Colwyn Bay Waterfront Phase 2b Coastal Defence Scheme (hereafter referred to as the 'Scheme').

The Scheme, located between Colwyn Bay (Porth Eirias) in the east and Rhôs-on-Sea in the west comprises coastal defence to improve the level of flood defences to Rhôs-on-Sea and the wider Colwyn Bay area along with facilitating regeneration.

Following the submission of an EIA Screening Opinion Request to CCBC on 2nd November 2020, a Screening Opinion was provided on 1st December 2020 that EIA would be required (see Appendix A). This EIA Scoping Report brings together the results of early desk-based assessments and other upfront work completed which have enabled the proposed scope and methodology of the EIA to be established.

1.2 Scheme background

The Colwyn Bay coastline between Rhôs Point and Tan Penmaen Head is approximately 3.5 km in length. Coastal flood defences were constructed for much of the coastline in the late 19th century and in general comprised vertical seawalls in either masonry or concrete.

As a result, during the 20th century, the frontage experienced a gradual lowering of beach levels in front of the defences requiring ongoing maintenance and repairs to the toe of the defences to ensure their integrity and stability. Groynes that were constructed in response to beach lowering, to retain the sand, ultimately failed or became redundant due to a lack of ongoing maintenance.

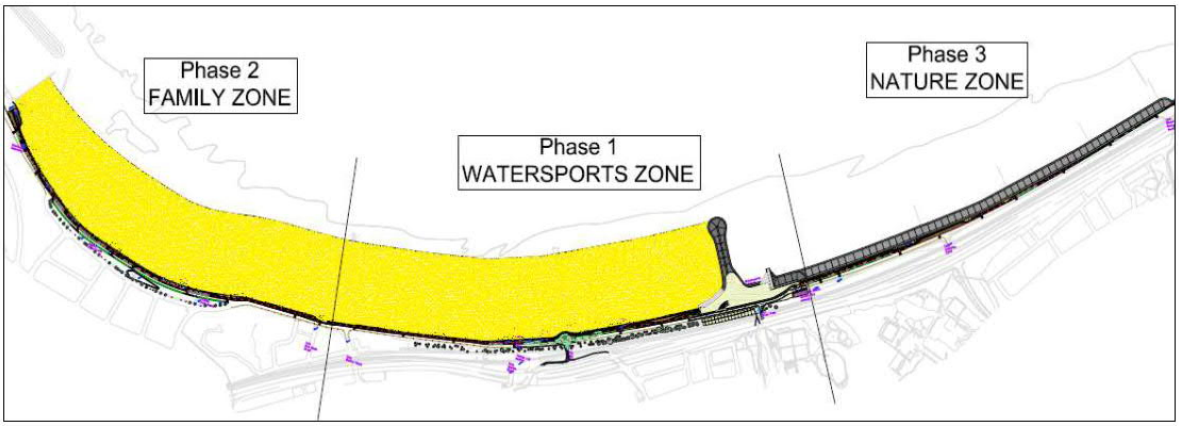
Since the 1990s, routine maintenance of the existing structures has been carried out to extend their residual life. This has included patch repair of the concrete and masonry walls as well as the addition of protective rock toes and revetment facings in some areas. Emergency works, comprising the addition of further piled and rock toes, were also carried out in several locations along the seawalls, notably at Old Colwyn to the east, in response to the rapid lowering of beach levels following severe storms.

In 2007, the Colwyn Bay Waterfront project was conceived as a result of the strategic assessment of options for future flood and coastal erosion risk management.

It was identified at an early stage of the strategic assessment process that merely improving the ageing linear defences alongside improved promenade facilities would not attract people back to the resort, as such an approach would not fully address the issue of low beach levels. Whilst this approach was functional in terms of providing a structurally stable and hydraulically efficient coastal defence and, due to the close proximity of suitable sources of rock, would probably be the most cost effective form of defence, CCBC officers felt that continuation of this approach across the Colwyn Bay frontage would accelerate rather than reverse the decline in the fortunes of the town. There was therefore a local determination to investigate more innovative solutions and use the improvements to the coastal defences as a catalyst for wider regeneration of Colwyn Bay.

The Colwyn Bay Waterfront Project was divided into three main Phases (see Figure 1.1).

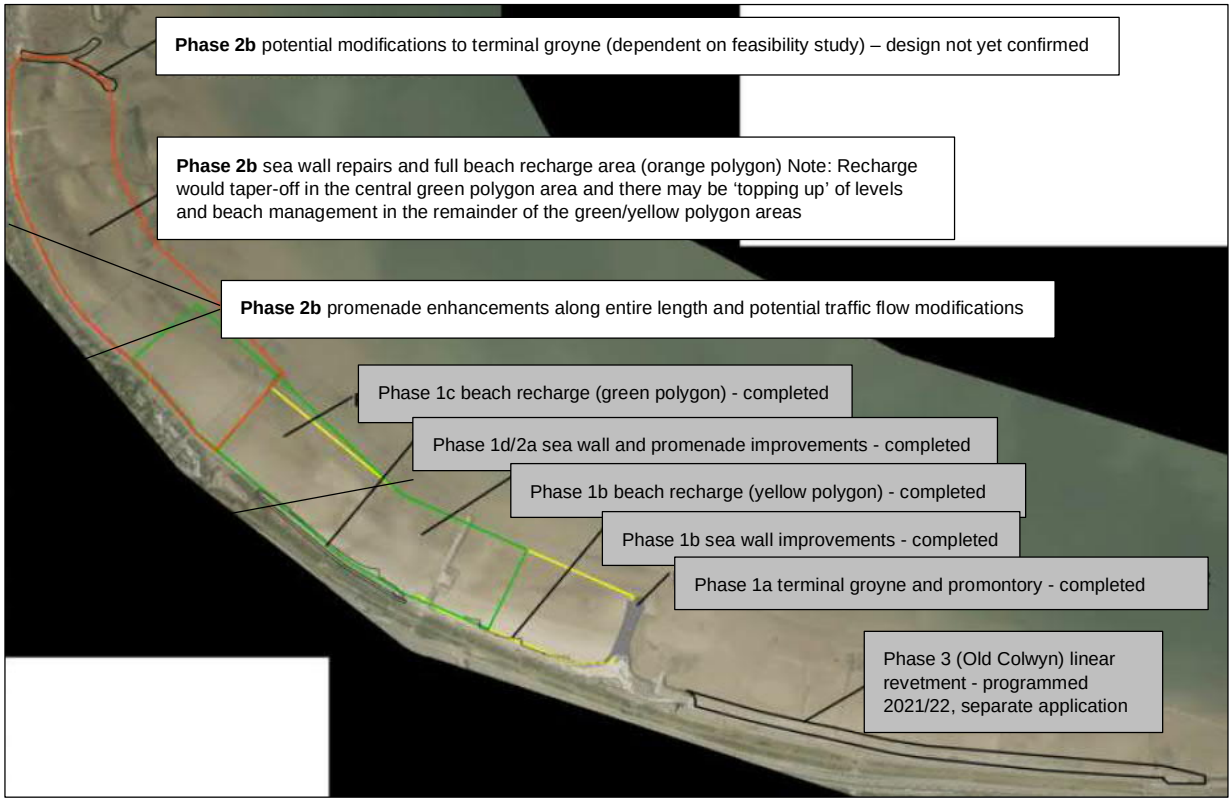
Figure 1.1: Colwyn Bay Waterfront – overall project phasing



Source: Project Appraisal Review and Update Report, CCBC, 2018 (Appendix D)

The phases were divided into a number of sub-phases. Phase 1a, 1b, 1c and 1d (also known as 2a in some reporting) of the project have already been completed. The eastern-most section at Old Colwyn between Splashpoint and Porth Eirias (Phase 3, not shown on Figure 1.1 or Figure 1.2) is subject to a separate planning application, the Old Colwyn Coastal Defence and Active Travel Scheme. This Scoping Report covers Phase 2b, which would complete the coastal defence and promenade improvements to Rhôs-on-Sea in the west (see Figure 1.2).

Figure 1.2: Colwyn Bay Waterfront - coastal works sub-phasing



Source: Source: Adapted from Project Appraisal Review and Update Report, CCBC, 2018 (Appendix D)

A summary of the works completed at each stage to date is provided in Table 1.1 to aid understanding of the Scheme background.

Table 1.1: Colwyn Bay Waterfront - project summary

Phase	Stage	Description	Completion Date
1	General	Phase 1 of the scheme was carried out in three stages covering approximately 35,000m^2. The site was located within the central section of the frontage either side of Victoria Pier from the section of seafront in the vicinity of Marine Road to the west, to the section of seafront parallel to the J22 eastbound slip road of the A55 Expressway to the east.	October 2014
1	a	Phase 1a of the scheme encompassed engineering works and environmental improvements. The engineering works comprised a 150m rock groyne structure perpendicular to the shoreline, with a short length of linear rock revetment to the east of the groyne, along with the construction of a sheet piled wall. A short section of concrete stepped revetment was also constructed along the western edge of the promenade. Existing slipway access at this location was raised and extended to follow the design of the new structures. The environmental works comprised the construction of Porth Eirias, a new multi-use water sports building, and landscaping works.	Engineering works – March 2012 Environmental works – April 2013
1	b	The coastal defence works primarily comprised beach recharge to the west of Porth Eirias, to bring beach levels up to the level of the existing promenade (approximately 5.00m above ordnance datum (AOD)) but below the existing sea wall crest (at approximately 6.15m AOD). Beach recharge was also undertaken between Cayley Promenade and Eirias Park, sourced from Liverpool Bay. Promenade enhancement was carried out to the west of the completed Porth Eirias Phase 1a works up to the pier area and extending below the Network Rail over-bridge as far as the interface with the train station. Enhancement works included improvements to the promenade consisting of; stepped revetment structures, 'headland' structures, access ramp, cycle ramp, car parking, promenade raising, secondary sea defence wall, streetlighting, street furniture and new town centre link works.	Coastal defence works – May 2013 Promenade enhancement works – October 2014
1	c	Coastal defences consisting of beach recharge (totalling 220,000m^3 dredged beach material) and associated infrastructure works, including extending surface water outfalls, repairs to the existing seawall and removal and replacement of rock armour. Works were completed in parallel with the Phase 1b promenade enhancements.	Coastal defence works – October 2014
2/1	*a/d*	*Note: Some reports refer to 1d, while others refer to 2a, these phases are one and the same.* Regeneration of two areas of coastline (Areas A and B) located between Victoria Pier and Cayley Embankment. Area A extended approximately 430m westwards from Victoria Pier to Princess Court apartments. Works comprised improved recreational opportunities and enhanced coastal defences across the site. This involved widening and raising the existing promenade and highway by constructing a new seawall approximately 7m seaward of the existing seawall, with three new headlands. Area B extended approximately 420m westwards from the Princess Court apartments to Rydal boat store near Cayley Embankment. Works included improved slipway access, beachfront access compliant with the Equalities Act 2010, car parking changes, seating, planting, railings, street furniture and lighting changes.	September 2017
Splashpoint		This scheme comprised the construction of a short section of 30m deep rock revetment against the sea wall at the location identified as being at highest risk of imminent collapse – the easternmost	July 2020

		section of the promenade (where a revetment is currently absent) known as 'Splashpoint'.	
3 (Old Colwyn Coastal Defence and Active Travel Scheme)		This phase comprises the construction of a 30m deep rock revetment along the base of the sea wall from Porth Eirias to join with the Splashpoint Project to the east with associated outfall extensions and new pedestrian accesses to the beach. It also includes active travel improvements to include new cycleway layouts, improved pedestrian access areas, improved lighting, new handrailing and improved signage along with other promenade improvements.	Anticipated 2023 (depending on funding)
2	b	Phase 2b works would be undertaken along the coastline from the Rydal Boat Store to Rhôs-on-Sea Harbour for the promenade improvement works and Horizon Shine kiosk to Rhôs-on-Sea Harbour for beach recharge with beach management and the potential for localised 'topping up' of beach levels to extend as far as Porth Eirias to the east. This is the Scheme under consideration in this EIA Scoping Request.	TBC

Source: Mott MacDonald Ltd, 2021

1.3 Location and context

1.3.1 Colwyn Bay

Colwyn Bay is a seaside town in Conwy County Borough on the North Wales coastline. Principal settlements comprise Rhôs-on-Sea to the west, the town of Colwyn Bay in the centre and Old Colwyn to the east. The A55 Expressway passes through the town, running parallel to the North Wales Coast (NWC) Railway Line, both of which eparate Old Colwyn and Colwyn Bay town from the waterfront, however both divert westward away from the waterfront in the Rhôs-on-Sea (Phase 2) area.

1.3.2 Colwyn Bay waterfront

A long promenade and associated cycle track follow the waterfront from Rhôs-on-Sea Harbour past the former location of the Victorian pier (the site of a new truncated pier) in the centre of the Bay and eastwards to Old Colwyn. There are slipways located adjacent to the new truncated pier area, Marine Road, to the west of Cayley Promenade and in Rhôs-on-Sea for beach access within the Scheme area. The beach predominantly comprises sand with shingle and intermittent rock revetment at the landward edge and a number of extended outfalls are present along with a single wooden groyne in poor condition. The Scheme is located along the beach, along the promenade and highway, and along Cayley Promenade.

The approximate national grid references for the western and eastern Scheme boundaries are SH84248052 and SH85717903 respectively.

1.3.3 Phase 2b area

The Scheme area currently comprises the existing seawall and adjacent sand and shingle of the Colwyn Bay to Rhôs-on-Sea beach along with the adjacent pedestrian promenade, the Promenade/West Promenade/Rhôs Promenade (highway) and in the central area the grassed embankment and Cayley Promenade to the west.

The proposed Scheme Red Line Boundary (RLB) (maximum extent) is included as Drawing 100374-MMD-00-XX-DR-Z-001 within Appendix B.

It should be noted that given site access points across the promenade and construction compound locations and areas have not yet been finalised, the RLB is currently considered to be conservative. It is anticipated that for the Environmental Statement (ES)

production, the Scheme RLB would be rationalised to include the area of permanent construction plus the minimum marine, intertidal and promenade working areas possible, construction compound areas and access locations where necessary.

1.3.4 Existing coastal defence condition

The seawall varies in composition between concrete and stonework and displays frequent damage to coping (loss of coping ties and occasionally entire stones along with frequent patch repairs).

In addition to the sea wall, rock revetment is present in sections intermittently. Where absent evidence of beach lowering and exposed sea wall footings are visible. Approaching Rhôs-on-Sea, the revetment becomes more haphazard with boulders more widely spaced.

East of Cayley Promenade, the sea wall has been repaired and improved as part of previous phases of the Colwyn Bay Waterfront Project, with the recharge beach increasingly providing the principal coastal defence moving eastward.

1.3.5 Current promenade condition

The width of the promenade varies greatly as does its current condition. The promenade surfacing is currently at its poorest below Cayley Promenade with large sections of macadam broken or missing. A number of shelters and kiosks are present; however several have been removed with only the foundations remaining. The area to the east of Cayley Promenade has been regenerated and improved through the previous phases of the Colwyn Bay Waterfront Project.

Cayley Promenade highway is separated from West Promenade by a steep mown grass bank (Cayley Embankment). Mature trees are located along the top of the bank with residential properties to the west.

1.3.6 Adjacent land uses

To the west of the highway (the Promenade, West Promenade and Rhôs Promenade travelling east to west along the coast) the Scheme is bounded by residential and commercial properties (including a number of hotels and B&Bs). To the east of Marine Road and the large residential building, Princess Court, the scheme is bounded to the south by the North Wales Coast Railway Line. The easternmost extent of the Scheme is bounded by Porth Eirias.

1.4 Environmental sensitivity – overview

It is understood that the beach recharge area of permanent works would not extend into the Liverpool Bay Special Protection Area (SPA), a European Site of Conservation Importance which is located approximately 215m seaward of the sea wall at its closest point. However, construction activities comprising boat and pipeline movements would take place within the SPA's boundary. The Scheme also extends into the North Wales Important Bird Area (IBA), the boundary of which is located along the sea wall at its closest point.

The potential pipeline construction area at Pensarn is located to the east of the Traeth Pensarn/Pensarn Beach Site of Special Scientific Interest (SSSI).

There are no Cadw listed buildings or Scheduled Monuments within the Scheme boundary.

The Scheme is bounded to the west by a large number of residential and commercial properties including multi-storey apartment blocks which offer elevated views across the Phase 2b area. It is also bounded (east of Marine Road and Princess Court) by the North Wales Coast Railway Line.

More detailed baseline environmental information specific to each environmental discipline is provided within Chapters 7 to 17.

Appendix B contains for a series of Environmental Constraints drawings:

- Drawing 100374-MMD-00-XX-DR-N-001 Statutory and Non-Statutory Designated Sites within 2.0km of the Scheme;
- Drawing 100374-MMD-00-XX-DR-N-002 Statutory Sites within 5.0km of the Scheme;
- Drawing 100374-MMD-00-XX-DR-N-003 Heritage and Landscape Constraints;
- Drawing 100374-MMD-00-XX-DR-N-004 Hydrological, Coastal and WFD (Water Framework Directive) Constraints;
- Drawing 100374-MMD-00-XX-DR-N-008 Residential Properties within the Local Impact Area;
- Drawing 100374-MMD-00-XX-DR-N-009 Community Resources within the Local Impact Area;
- Drawing 100374-MMD-00-XX-DR-N-012 Potential Pipeline Construction Site – Pensarn, Statutory Designated Sites within 2km.

1.5 Aim of EIA Scoping process

EIA Scoping forms the second stage in the EIA process after Screening and involves identifying the environmental disciplines that should be included within the EIA through the consideration of environmental factors and potential existing and/or new receptors. EIA scoping initiates the process of defining the potential for significant effects, which in turn results in the identification of the environmental factors which require consideration and assessment as part of the EIA.

Under Regulation 15 of the Town and Country Planning (EIA) (Wales) Regulations 2017 and also according to the Marine Works EIA Regulations 2007 (as amended), hereafter referred to together as the 'EIA Regulations', (unless reference needs to be made to one or the other specifically in which case they will be referred to as the 'T&CP EIA Regulations' and the 'MW EIA Regulations' respectively) "*a person who is minded to make an EIA application may ask the (appropriate authority) to state in writing their opinion as to the scope and level of detail of the information to be provided in the environmental statement (a "scoping opinion")*.

1.6 Report objectives

The objectives of this report are to:

- Set out the proposed scope of the EIA (i.e. identify which environmental disciplines are to be 'scoped in' or 'out'), taking into account what is currently known about the application site and the Scheme;
- Facilitate consultation with the Local Authority (CCBC), Natural Resources Wales (NRW) and other relevant statutory and non-statutory bodies on the environmental issues to be addressed as part of the EIA and design development process;
- Set out what additional information needs to be collected (i.e. through desk-based studies or field survey work) to characterise the baseline environment of the application site;
- Define the assessment methods to be used to determine the likely significant environmental effects of the Scheme;
- Identify potential effects and opportunities for mitigation; and
- Set out the proposed structure of the ES.

1.7 Report structure

Following this introduction, the report covers the following key areas:

- Chapter 2: Proposed development scope – outlines the high-level specification of the Scheme based on current design information available and an overview of likely construction methods;
- Chapter 3: Planning context summary – covers both national and local planning policy;
- Chapter 4: Overview of EIA screening and scoping – establishes the approach undertaken to date;
- Chapter 5: Consultation; and
- Chapter 6: Potential for cumulative effects.

Subsequent to this, each environmental discipline undergoes a scoping assessment which comprises an introduction to the discipline and definition of the study area, summary of the baseline conditions along with any assumptions/limitations followed by a brief assessment of the likely effects relating to the Scheme according to current legislation and guidance, identification of supplementary mitigation measures that should be considered and identification of any supporting work required.

- Chapter 7: Air Quality;
- Chapter 8: Archaeology and Cultural Heritage;
- Chapter 9: Biodiversity;
- Chapter 10: Climate;
- Chapter 11: Coastal Processes (including Flood Risk, Coastal Water Quality and Navigation);
- Chapter 12: Geology and Soils;
- Chapter 13: Landscape and Visual;
- Chapter 14: Materials and Waste;
- Chapter 15: Noise and Vibration;
- Chapter 16: Population and Health; and
- Chapter 17: Traffic, Transport and Access.

Following the scoping assessments, the proposed final scope and the necessary actions required in order to align the ES with the EIA Regulations is presented in Chapter 18 and a list of abbreviations and acronyms used throughout this report is provided in Chapter 19.

Appendices provided comprise the following:

- Appendix A: EIA Screening Response;
- Appendix B: Supporting Drawings;
  - Drawing 100374-MMD-00-XX-DR-N-001 Statutory and Non-Statutory Designated Sites within 2.0km of the Scheme;
  - Drawing 100374-MMD-00-XX-DR-N-002 Statutory Sites within 5.0km of the Scheme;
  - Drawing 100374-MMD-00-XX-DR-N-003 Heritage and Landscape Constraints;
  - Drawing 100374-MMD-00-XX-DR-N-004 Hydrological, Coastal and WFD (Water Framework Directive) Constraints;
  - Drawing 100374-MMD-00-XX-DR-N-008 Residential Properties within the Local Impact Area;
  - Drawing 100374-MMD-00-XX-DR-N-009 Community Resources within the Local Impact Area;

  - Drawing 100374-MMD-00-XX-DR-N-012 Potential Pipeline Construction Site – Pensarn, Statutory Designated Sites within 2km;
  - Potential landscape General Arrangement (GA) Drawing (BCA 19.514-100-OD-01); and
  - Preferred option one-way system Junction Drawing (411842-MMD-00-XX-SK-C-0001).
- Appendix C: Outline EIA Methodologies;
- Appendix D: Project Appraisal Review and Update (May 2018); and
- Appendix E: Supporting Technical Reports:
  - Detailed Modelling Studies for Colwyn Bay Coastal Defence Scheme: Physical Model Tests of Linear Defences (2010);
  - Colwyn Bay Detailed Modelling Study for Coast Defence Scheme, Phase 1 Interim Modelling Technical Note (2010);
  - Colwyn Bay Physical Model, Coastal Defence Schemes Modelling Report (2017) (covers area west of site);
  - Over Wintering Bird Survey Report, Mott MacDonald Ltd, 2020 (410895-MMD-N-R-00-XX-1700);
  - Preliminary Ecological Appraisal Report (PEAR), Mott MacDonald Ltd, 2020, (410895-MMD-N-R-00-XX-1701); and
  - Colwyn Bay Waterfront Project, Archaeological and Historical Assessment, Birmingham Archaeology, October 2010.

1.8 Overarching reference reporting

For this Scoping report, the following key documents have been used for reference, with individual environmental discipline chapters listing supplementary reference reporting:

- Colwyn Bay Waterfront Phase 1 Engineering Works ES Volumes 1-3, Mott MacDonald Ltd, October 2010;
- ES Addendum for Colwyn Bay Waterfront Phase 1b Promenade Enhancement and Phase 1c Coastal Defence, Mott MacDonald Ltd, December 2013;
- Colwyn Bay Waterfront Environmental Appraisal Report for Phase 2(a), Mott MacDonald Ltd, September 2015;
- Old Colwyn Coastal Defence and Active Travel Scheme (Colwyn Bay Waterfront Project Phase 3) ES Volumes 1-3, Mott MacDonald Ltd, July 2020; and
- Colwyn Bay Waterfront Scheme, Project Appraisal Review and Update, CCBC, 2018 (Appendix D).

2 Proposed Scheme

2.1 Colwyn Bay Waterfront Project objectives

The overarching objectives for the Colwyn Bay Waterfront Project are to[1]:

- Provide renewed coastal defences along the waterfront to protect the residents and businesses of the town from the threat of flooding from the sea;
- Integrate the renewed sea defences with environmental improvements along the promenade to provide a coordinated approach to delivery of the project which maximises the regeneration potential while also providing the necessary level of coastal protection; and
- Provide environmental improvements to the promenade to offer a modern, robust, sustainable and attractive public realm to draw new visitors to the area and coordinate with the Bay Life Initiative's development plan.

2.2 Do-Nothing scenario

The principal assumptions associated with the Do-Nothing scenario for the Colwyn Bay Waterfront Scheme in its entirety are[2]:

- Overtopping of defences causing closure of the promenade and traffic diversion; and
- Failure of defences leading to permanent traffic diversions, loss of commercial and residential properties and loss of railway and highway infrastructure, with the following applying:
  - Defences, promenade and highway behind assumed to fail in year 5;
  - Property adjacent to highway lost at the same time;
  - Railway becomes unsafe operationally from year 10; and
  - Loss of the A55 Expressway in year 55.

Realisation of the full benefits of the Waterfront Project requires all three phases to be implemented. Without completion of Phase 2 and its on-going requirement for beach management, the risk of failure of existing defence walls would return, major disruption to local and regional transport links would ensue and investment already made in the Colwyn Bay Waterfront would be undermined.

2.3 Option selection

The original option assessment identified that there were two potential alternatives to meet the requirements for coastal defence, as follows:

- A linear rock revetment incorporating a new promenade across the whole frontage; or
- A combination of beach recharge across the Rhôs-on-Sea to Porth Eirias section, with a terminal groyne at the eastern end of this section (Phase 1), together with a linear rock revetment from Porth Eirias to Beach Rd, Old Colwyn (Phase 3/Old Colwyn Coastal Defence and Active Travel Scheme).

Three further variations on the beach recharge option for the Phase 2 area were considered[1] bringing the final list to:

- Do-nothing/minimum;

[1] Colwyn Bay Waterfront Scheme, Project Appraisal Review and Update, May 2018

[2] Colwyn Bay Waterfront Project, Coastal Defence Improvements, PAR Update, September 2010, Mott MacDonald Ltd

- Linear rock revetment;
- Beach recharge with terminal groyne and rock revetment at east end;
  - Beach recharge with no additional control structures;
  - Beach recharge with single offshore breakwater across Phase 2 frontage;
  - Beach recharge with twin offshore breakwaters across Phase 2 frontage; and
  - Beach recharge with shore connected groynes across Phase 2 frontage.

All beach recharge options included for increasing in height the existing rock groyne on the south side of Rhôs Harbour, in order to prevent beach recharge sediment being washed into the harbour area.

The preferred approach for the frontage, primarily due to the added value and wider benefit it provided was identified as being the combination of beach recharge and rock structures as shown in Figure 2.1.

Following appraisal, the beach recharge option without control structures was identified as being the most cost effective. In addition, environmentally due to its lowest initial intervention requirement the beach recharge only option was identified as the option with the least environmental impacts and risk.

2.4 Scheme scope

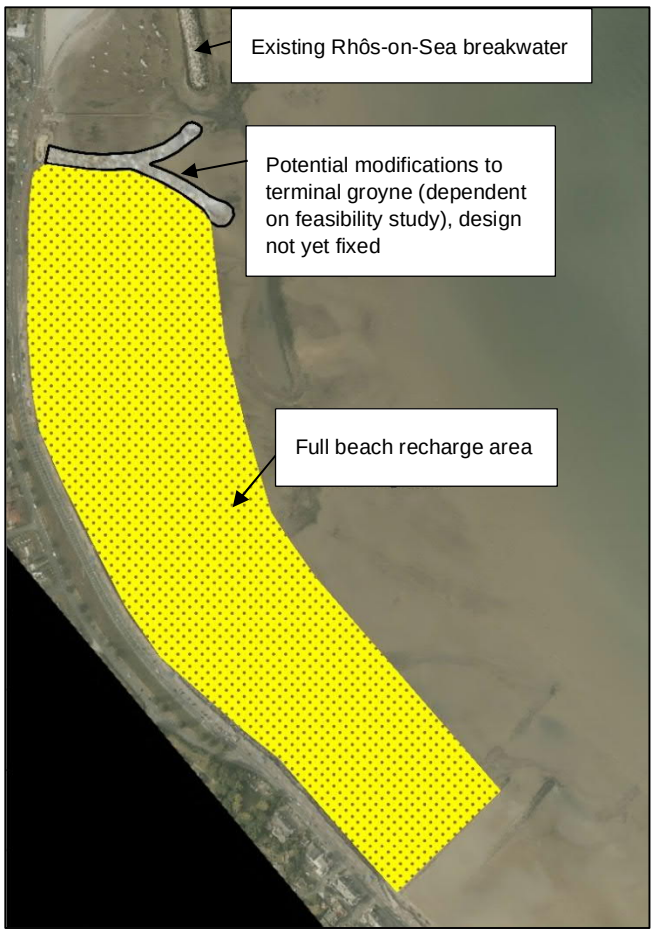
The proposed scope of work would comprise a combination of coastal defence and promenade improvements.

2.4.1 Coastal works

The coastal defence works would be anticipated to include:

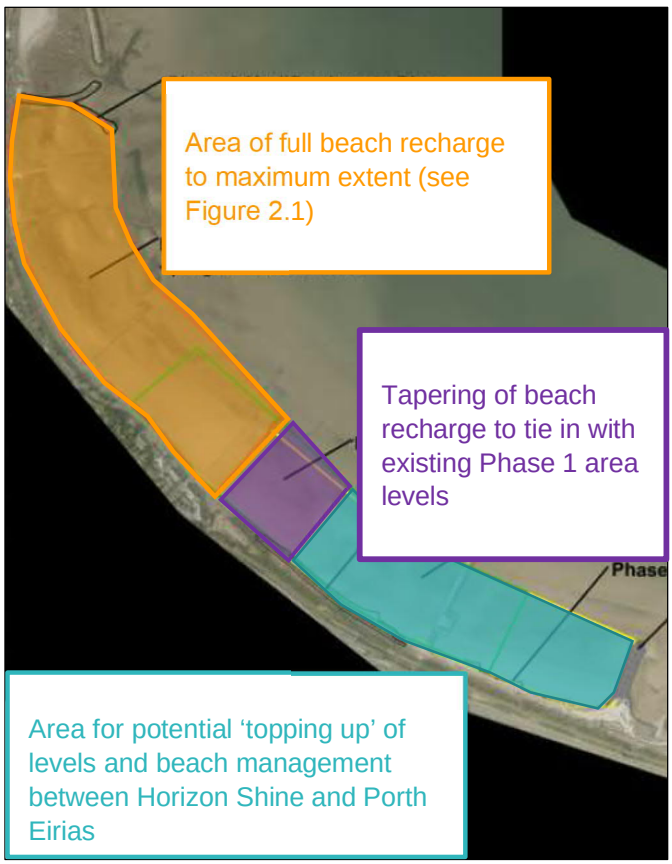
- From Rydal Boat store to the southern boundary of Rhôs-on-Sea Harbour:
  - Minor repairs (e.g. re-pointing) to the existing sea wall;
  - Removal of remaining areas of existing rock revetment located against the sea wall in recharge areas for re-use elsewhere; and
  - Modification of outfalls as appropriate to enable them to continue operating with the raised beach levels.
- From Horizon Shine to the southern boundary of Rhôs-on-Sea Harbour (see Figure 2.1 and Figure 2.2):
  - Beach recharge involving the importation and placement of approximately 1,000,000t (~625,000m^3) of dredged sand material between the Rhôs-on-Sea terminal groyne to the west and the Horizon Shine Kiosk to the east to bring levels up to match the design profile of the Phase 1 works (approximately 5mAOD); and
  - Improvements to the curved rock groyne adjacent to Rhôs-on-Sea Harbour (feasibility study to be completed, design not yet fixed).
- To the east of the Horizon Shine Kiosk:
  - The Scheme would also appropriately include for any ‘topping up’ of beach levels and the management/recycling of the existing beach that may be required between the Horizon Shine Kiosk and the Porth Eirias groyne.

Figure 2.1: Proposed full beach recharge area



Source: Adapted from Project Appraisal Review and Update Report, CCBC, 2018 (Appendix D)

Figure 2.2: Proposed tapering of beach recharge



Source: Adapted from Project Appraisal Review and Update Report, CCBC, 2018 (Appendix D)

2.4.2 Promenade works

The promenade improvement works are currently anticipated to comprise upgrading the promenade to enhance the experience to the general public visiting the promenade. The design is on-going however it is currently anticipated to include:

- The inclusion of a 2.2m wide pedestrian-only zone;
- 4m wide shared surface with health markers at 50m intervals;
- Designated picnic / seating areas;
- Activity zones;
- "Rhôs" feature letters and artwork;
- Pedestrian links across the highway & promenade;
- Intermediate links across promenade & shared surface;
- New surface finishes;
- Landscaping (including if appropriate planting / soft landscaping);
- Streetlighting; and
- Street furniture / features.

A potential outline General Arrangement drawing has been produced by BCA Landscape (see Drawing BCA 19.514-100-OD-01 in Appendix B) assuming the option of a one-way scheme around Cayley Promenade is taken forward (as discussed in Section 2.4.3).

The new promenade finishes are to be low maintenance and robust solutions in consideration of the harsh environment of the site location

2.4.3 Traffic flow changes

Options have been considered for changing the flows of traffic in the West Promenade – Cayley Promenade area including:

- Full pedestrianisation of West Promenade between the extents of Cayley Promenade;
- One-way traffic to be permitted along West Promenade returning via Cayley Promenade; and
- Retention of two-way traffic along West Promenade.

The current preferred option is the implementation of a one-way system, which would allow for a widened pedestrian and active travel zones and improved promenade parking areas along West Promenade while reducing the impacts associated with a full closure of West Promenade (see Drawing 411842-MMD-00-XX-SK-C-0001 in Appendix B).

A final decision on this has not yet been made and further consultation with key stakeholders would be completed before the final design is selected however for the purposes of this Scoping Report the implementation of a one-way system has been assumed as the most likely design outcome.

2.4.4 Management and maintenance

The Scheme also includes future management and maintenance actions comprising:

- Inspection, maintenance and repair of coastal defence structures;
- Inspection, maintenance and repair of Promenade and sea wall;
- Inspection, maintenance and repair of accesses, drainage, highways, lighting and other ancillary assets;
- Management of wind-blown sand;
- Maintenance of landscaping; and
- Beach management/reprofiling and small-scale re-nourishment as necessary.

2.5 Preliminary methodology

Design for the Scheme is currently on-going and the following high-level information is based on current best understanding. The below is a preliminary outline methodology only and is subject to detailed design, amendment, consent and construction stage contractor methodology and risk assessments.

2.5.1 Timescales

Due to funding constraints, construction is anticipated to commence by March 2022 at the latest and last for approximately 12 months.

Given the scale of the Scheme it is possible that the work would be completed in stages.

2.5.2 Initial coastal works

The Scheme is currently at the outline design stage and the methodology is yet to be formally established, however it is anticipated that the following would be completed in the first instance:

- Initial repairs of the sea wall where necessary (structural repairs carried out to increase the lifespan and the protection afforded by the structure);

- Modifications to the rock groyne adjacent to Rhôs-on-Sea Harbour (feasibility, scope and design yet to be determined);
- Removal of existing rock toe from the sea wall (where necessary); and
- Modifications/extensions to any outfalls necessary.

This is all proposed to be completed at low tide using land-based plant. Access to the foreshore would be gained using existing accesses.

2.5.3 Beach recharge works

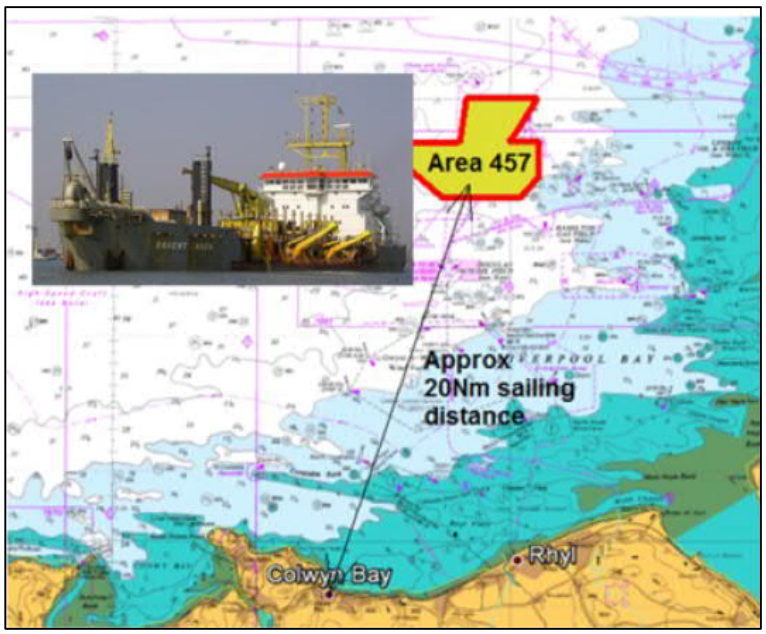
The beach recharge would involve the importation and placements of approximately 1,000,000t (~625,000m^3) of dredged sand material between the Rhôs-on-Sea terminal groyne to the west and the Horizon Shine Kiosk to the east to bring levels up to match the design profile of the Phase 1 works.

In addition, the Scheme would also appropriately include for any management/recycling of the existing beach that may be required between the Horizon Shine Kiosk and the Porth Eirias groyne.

The sea dredged sand, likely to be d50 (sand grain size) between 0.2mm and 0.4mm, would be obtained from existing offshore license dredging areas and transported to the site by sea and placed to profile on the beach.

Sand from the previous phases came from Area 457 owned by Westminster Gravels (see Figure 2.3). This area is located approximately 40.0km NNE by sea with grading falling within the acceptable recharge grading envelope. It is considered likely (although not certain) that sand would again be imported from this area for consistency with the previous phases.

Figure 2.3: Location of Area 457



Source: Work Method Statement, Colwyn Bay Coastal Defence Phase 1b, March 2013

The proposed method of recharge is likely be the same as utilised for previous phases – comprising pipeline delivery:

- Material would be dredged from the seabed and transported to Colwyn Bay in a medium sized Trailing Suction Hopper Dredger (TSHD) (a sea-going self-propelled ship equipped

with one or two suction pipes, designed to hang along the side of the vessel – a draghead is fixed at the lower end of the suction pipe, which is then trailed along the bottom of the seabed. Suction is provided by a pump, which lifts the sand off the seabed and discharges the mixture of sand and water into the hopper well);

- A floating and sinker pipeline (~1600m to 1800m in length, of which ~200m is anticipated to be the floating pipeline closest to the dredger) is to be assembled either above Mean High Water of Spring Tides (MHWST) in the Phase 1 area to the west of Porth Eirias, or, at a nearby beach in Pensarn (used for the previous phases, see Photo 2.1 and Drawing 100374-MMD-00-XX-DR-N-012 in Appendix B) and transported to site by sea. For previous recharge works, the first length of pipeline was launched over high tide and positioned at the end of the second length, welded during low tide and then the full length of pipeline launched over the subsequent high tide. The TSHD would connect to the pipeline and pump the material (which is first fluidised with sea water) ashore (see Photo 2.2); and
- Land based plant (bulldozers) would spread the material into the required beach profile and prepare the area for the next discharge operation by moving the shore section of pipeline to the required location (see Photo 2.3).

The delivery and placement of sand would be a 24-hour operation anticipated to take around 8 weeks if using a large TSHD. There is the potential to use smaller TSHDs which may have some benefits including pumping at all tidal states, fewer potential delays, shorter pipeline lengths and better vessel availability, however would likely increase the sand deposition programme to 15 to 20 weeks. Currently all options are under consideration.

On completion of the operation, the pipeline would be dismantled and removed from site, either towed away by sea or dismantled and removed from site by road. The Phase 1 beach area may be suitable for demobilisation of the sinker line.

Photo 2.1: Floating the pipeline at high tide during previous Phase 1 works at Pensarn Beach

Source: CCBC

Photo 2.2: Beach recharge works during previous phase – view from TSHD of the floating pipeline

Source: CCBC

Photo 2.3: Beach recharge works during previous phase – view from shore of the sinker and shore pipelines with the TSHD and floating line in the distance

Source: CCBC

2.5.4 Promenade works

Given the current stage of design, the methodology for the construction of the promenade works has not yet been finalised although it is considered likely to commence after sea wall repairs, terminal groyne improvements and beach recharge have been completed.

The seaward edge of the promenade would be inspected, and potential structural repairs carried out to increase the lifespan and the protection afforded by the structure. If this identifies existing voids in the highway or Promenade, these would be repaired (using standard methods, such as excavating voids and backfilling with compacted granular fill). As part of the works, any new drainage pipes, service ducts, kerbing, street lighting / sign foundations would be constructed. Once the heavy civil engineering works are complete, the street furniture, signs, artwork features, lighting, landscaping, road markings etc would be installed.

The current preferred option is for West Promenade to be reduced to one-way traffic, which would provide the space for the above proposed pedestrian, shared surface zones and promenade parking areas. It is also proposed that Cayley Promenade would become one-way (opposite flow direction to West Promenade) to maintain existing traffic flows through the area and links to the wider Colwyn Bay and A55 Expressway.

2.5.5 Travel route closures and diversions

It is understood that road closures would be required during construction using the diversion along Cayley Promenade primarily when the West Promenade below Cayley Embankment is required. However, to the east and west of Cayley Promenade it is anticipated that temporary traffic management would be sufficient. The requirement for road closures and diversions would be confirmed within the ES and in consultation with CCBC Highways Officers.

Temporary diversions would be required for pedestrian and other non-motorised users of the promenade and national cycle route as they pass through the Scheme area.

2.5.6 Other

A Construction Environmental Management Plan (CEMP) would be produced prior to site works commencing to determine the reasonable and practicable steps to be taken to avoid the pollution of the surrounding environment (surface waters in particular).

Working hours would be as agreed with CCBC's Environmental Health Officers to allow for tidal working. Information for local residents and businesses would be provided on the works to be undertaken along with timescales and any diversion routes.

Enabling works are considered likely to include the setup and provision of accesses to construction compounds and work locations, storage areas and mobilisation of site welfare facilities.

2.5.7 Temporary construction compounds and beach access

Potential temporary compound locations would be required at locations along the promenade. Due to the linear length and narrow works access along the promenade, multiple satellite compounds are likely to be necessary to ensure works can progress and be finished-off in a timely manner, reducing the time any length of promenade closure is required. It is anticipated these would all be located within the existing conservative RLB (Appendix A).

All access ramps would be required for use at different stages of the Scheme. When finalising the access points and durations of use, consideration would be given to any implications for other users.

3 Policy context

3.1 National policy

3.1.1 Planning Policy Wales (Edition 11, February 2021)

Planning Policy Wales (PPW) sets out current land use planning policy for Wales. It provides the policy framework for the effective preparation of local planning authorities' (LPAs') development plans. Sections of particular relevance are presented below.

3.1.1.1 Relevant to the coastal defence scheme aspects

6. Distinctive and Natural Places

6.5 Coastal Areas: 6.5.20 *"In considering new coastal defence works, account should be taken of all potential environmental effects, both on and off-shore, including the impacts on habitat fragmentation and consequential 'coastal squeeze', as well as information contained in Shoreline Management Plans and other relevant documents such as Area Statements".*

6.6 Water and Flood Risk: 6.6.28 *"New or improved flood defences in coastal and/or riverside locations should be carefully planned, ensuring all potential environmental effects, both on and off-shore, and relevant Shoreline Management Plan policies are taken into account. Flood defence works can provide opportunities to achieve wider social, economic and environmental benefits, which should be maximised where possible. Nature based solutions should be the first consideration given the opportunity to deliver other multiple benefits, including habitat creation, biodiversity enhancement and water quality improvements. Overall, green infrastructure opportunities can benefit ecosystem resilience and provide opportunities for leisure facilities or renewable energy generation".*

3.1.1.2 Relevant to regeneration aspects

3. Strategic Spatial Choices: Promoting Healthier Places

3.20 "Disadvantaged and deprived communities tend to be disproportionately affected by health problems. There are links between the built and natural environment and health throughout a person's lifetime and an understanding of the wider determinants of health should be a key component of development plan preparation. The planning system should identify proactive and preventative measures to reduce health inequalities. This will include enabling opportunities for outdoor activity and recreation, reducing exposure of populations to air and noise pollution, promoting active travel options and seeking environmental and physical improvements, particularly in the built environment".

3.1.2 The Well Being of Future Generations (Wales) Act 2015

"The Well-being of Future Generations (Wales) Act 2015 – places a duty on the Welsh Ministers (and other public bodies) to produce well-being objectives and take reasonable steps to meet those objectives in the context of the principle of sustainable development".

The Well-being of Future Generations (Wales) Act 2015 (WBFGA) is legislation requiring

Welsh public bodies to put long-term sustainability at the forefront of their thinking, and work to prevent and tackle persistent problems such as poverty, health inequalities and climate change. In order to create a more sustainable Wales, public bodies must work towards seven Well-being Goals and enact the five Ways of Working, whilst showing how they are doing this by publishing Local Well-being Plans.

The Seven Well-being Goals are:

1. A prosperous Wales;
2. A resilient Wales;
3. A healthier Wales;
4. A more equal Wales;
5. A Wales of cohesive communities;
6. A Wales of vibrant culture and thriving Welsh language; and
7. A globally responsible Wales.

The Act also sets a requirement on Public Bodies in Wales to set and publish well-being objectives, that are designed to maximise their contribution to achieving each of the well-being objectives. For the sake of the practice of this Act, Conwy and Denbighshire have merged to form Conwy and Denbighshire Public Services Board and have published a set of three Priorities and four Additional Principles.

Priorities:

1. People – Good Mental Well-being for All Ages;
2. Community – Community Empowerment; and
3. Place – Environmental Resilience.

Additional principles:

1. To address inequalities and treat everyone equally;
2. To support and promote the Welsh Language;
3. To support access to appropriate accommodation; and
4. To avoid duplication.

3.1.3 Technical Advice Notes

PPW is supplemented by 21 topic-based Technical Advice Notes (TANs). Procedural guidance is given in Welsh Office / National Assembly for Wales / Welsh Government Circulars. Each TAN provides detailed planning advice on a different subject. The TANs considered to be relevant to this Scheme are:

- TAN 5: Nature Conservation and Planning;
- TAN 11: Noise;
- TAN 12: Design;
- TAN 13: Tourism;
- TAN 14: Coastal Planning;
- TAN 15: Development and Flood Risk;
- TAN 16: Sport, Recreation and Open Space;
- TAN 18: Transport;
- TAN 20: Planning and the Welsh Language;
- TAN 21: Waste;
- TAN 23: Economic Development; and
- TAN 24: The Historic Environment.

TAN 15 is of particular relevance. This TAN provides technical guidance which supplements the policy set out in PPW in relation to development and flooding. It advises on development and flood risk and provides a framework within which risks arising from both river and coastal

flooding, and from additional run-off from development in any location, can be assessed. TAN 15 recognises that sea level rise and increased storminess are some of the most likely effects of climate change to which Wales would need to adapt in the future. Note: TAN 15 is in the process of being updated and any updates will be accounted for if released during the EIA process timescales.

3.1.4 Future Wales The National Plan 2040

Published in February 2021, this National Development Framework (NDF) replaces the Wales Spatial Plan (2008). It is a new 20 year strategy which sets out the Welsh Government's policies on development and land use in a spatial context and is required under the Planning (Wales) Act 2015 and must be reviewed at least every five years.

Colwyn Bay is located within the North Wales Region (comprising Conwy, Denbighshire, Flintshire, Gwynedd, the Isle of Anglesey, Snowdonia National Park and Wrexham). It is mentioned specifically in Policy 21:

Policy 21 – Regional Growth Area – North Wales Coastal Settlements

"The Welsh Government supports sustainable growth and regeneration in regionally important towns along the northern Coast. Holyhead, Caernarfon, Bangor, Llandudno, Colwyn Bay, Rhyl and Prestatyn will be a focus for managed growth and they have an important sub-regional role complementing the National Growth Area of Wrexham and Deeside.

Strategic and Local Development Plans should recognise the roles of these places as a focus for housing, employment, tourism, public transport and key services within their wider areas and support their continued function as focal points for sub-regional growth."

In addition the National Plan 2040 states:

"The potential for flooding around Wrexham, Deeside, and along the north coast will have implications for the delivery of growth in the region. Policy 8 sets out the national strategic approach to flood risk management and will ensure growth aspirations in National and Regional Growth Areas are co-ordinated with strategic decisions on managing flood risk."

3.1.5 Welsh National Marine Plan (November 2019)

This Welsh National Marine Plan (WNMP) is the first marine plan for Wales and represents the start of the process of shaping Welsh inshore and offshore marine waters to support economic, social, cultural and environmental objectives. It sets out how proposals will be considered by decision makers for the sustainable development of the marine area. Marine planning will guide the sustainable development of the marine area by setting out how proposals will be considered by decision makers.

It has been prepared and adopted under the Marine and Coastal Access Act (MCAA) 2009. The WNMP and supporting material should be used by applicants to shape proposals and licence applications for the sustainable development of the Plan area.

The Plan vision will be delivered through the Plan's objectives supported by general, cross-cutting policies and sector-specific objectives and policies. Plan objectives describe the desired outcomes this Plan is seeking to achieve, thereby supporting the UK High Level Marine Objectives (HLMOs) and the UK Marine Policy Statement (MPS).

3.1.6 National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in Wales, October 2020

The second National Strategy for FCERM in Wales replaces the first strategy published in 2011, prepared under the terms of the Flood and Water Management Act 2010.

The strategy sets out how the risks from flooding and coastal erosion are to be managed and provides key objectives and measures for all partners to work towards over the next decade.

Key changes to this National Strategy include the clarification of roles and responsibilities around flood and coastal erosion, the promotion of natural measures and catchment approaches, new objectives on improving understanding and preventing exposure to risk, highlighting the importance of good information and effective planning, and direction on how investment is prioritised.

The key aim of the National Strategy is *"to reduce the risks to people and communities from flooding and coastal erosion".* The key objectives are:

1. *"Improving our understanding and communication of risk;*
2. *Preparedness and building resilience;*
3. *Prioritising investment to the most at risk communities;*
4. *Preventing more people becoming exposed to risk; and*
5. *Providing an effective and sustained response to events."*

3.2 Local Policy

3.2.1 Shoreline Management Plan

The North West England and North Wales Shoreline Management Plan covers the North Wales Coast (SMP22, sub-cell 11a) August 2016, within which the policy for the frontage is to Hold the Line for the next 100 years: "*This policy includes those situations where work is carried out in front of the existing defences (such as beach recharge, rebuilding the toe of a structure, building offshore breakwaters and so on) to improve or maintain the standard of protection provided by the existing defence line. It also includes work behind existing defences (such as building secondary flood defences) where this work would form an essential part of maintaining the current coastal defence system*".

3.2.2 The Conwy Local Development Plan 2007-2022, adopted October 2013

According to mapping within the Local Development Plan (LDP), the Scheme is located within the Coastal Zone, a strategic regeneration area, and from Rotary Way to the west, within the Colwyn Bay Masterplan Area.

Key Issues identified as impacting on the LDP area include the following 'Priority Issues' relevant to the Scheme:

- Tackling Deprived Areas: "*Colwyn Bay has experienced a significant decline in the tourism industry. There is a need to promote the comprehensive regeneration and renaissance of Colwyn Bay to broaden economic activity, address social exclusion, reduce deprivation, and limiting and reducing Houses in Multiple Occupation (HMO) through the Strategic Regeneration Area Initiative and the Colwyn Bay Masterplan".* (Sources: Wales Spatial Plan (Update 2010), Bay Life Initiative Strategy (2006), Government Strategic Regeneration Initiative Area Status, Colwyn Bay Masterplan Brief (2009), Colwyn Bay Masterplan Baseline Study, 'Turning the Tide Strategy', BP/37 'Growth Distribution Options Report').
- Protecting Regional & Town Centres: *"The regional centre of Llandudno and other important Town Centres within the Plan Area experience pressure from non-retail uses. There is a need to maintain and, where appropriate, enhance Llandudno as the retail centre for the region, promote the regeneration of Colwyn Bay, as well as other retail centres and, where possible, enhance the overall vitality, attractiveness and viability of the centres through a more diverse shopping experience".*

- Encouraging Sustainable Transport: *"The dominant mode for journeys to work, including high outward commuting, is by car within the Plan Area. There is a need for improved sustainable transport use and transport infrastructure in Conwy through the development of an integrated transport system, sustainable accessibility in urban and rural areas, public transport provision, modal interchanges, increased cycling and walking facilities and the requirement of travel plans to reduce car dependency".*

The following LDP policies are also considered to be relevant to the Scheme and would be considered in the preparation of the ES:

- DP/1 – Sustainable Development Principles;
- DP/3 – Design Quality and Crime Reduction;
- DP/4 – Development Criteria;
- DP/5 – Infrastructure and New Developments;
- DP/6 – National Planning Policy and Guidance;
- DP/8 – Colwyn Bay Urban Regeneration Masterplan;
- NTE/1 – The Natural Environment;
- NTE/3 – Biodiversity;
- NTE/5 – The Coastal Zone;
- STR/1 – Sustainable Transport, Development and Accessibility;
- STR/3 – Mitigating Travel Impact;
- MWS/1 – Minerals and Waste;
- MWS/3 – Safeguarding Hard Rock and Sand and Gravel Resources;
- CTH/1 – Cultural Heritage; and
- CTH/2 – Development Affecting Heritage Assets.

3.2.3 Conwy Local Flood Risk Management Strategy (February 2013)

This local strategy aims to complement and support the Welsh governments' "The National Strategy for Flood and Coastal Erosion Risk Management (Wales)". CCBC have been designated as a Lead Local Flood Authority (LLFA) and is required under the Flood and Water Management Act 2010 to develop, maintain and monitor a local flood risk management strategy in its area and forms a new chapter within the FCERM for Conwy.

4 EIA Screening and Scoping

4.1 EIA Regulations

4.1.1 EIA Directive

The amended EIA Directive (2014/52/EU) (hereafter referred to as the Directive) requires an EIA to be carried out in support of an application for development consent for categories of project listed in the Directive at Annexes 1 and 2. For schemes included within Annex 1, EIA is mandatory, while within Annex 2, an EIA is required if the development is likely to have *significant* effects on the environment. This Directive has been transposed into UK legislation through various EIA Regulations which remain in force following the UK's withdrawal from the EU.

4.1.2 EIA Regulations

The Scheme requires consent under the Town and Country Planning Act 1990 and consequently must be assessed under the T&CP EIA Regulations.

In addition, the MW EIA Regulations transpose the EIA Directive so that where applicable, EIAs are carried out prior to granting permission for the deposit of substances or articles within UK waters or UK controlled waters, either in the sea or under the sea bed, from various structures, vessels, containers or structures on land, or anywhere in the sea (where a Marine Licence is required). UK Waters include any area which is submerged at mean high water spring tide. A Marine Licence is required for the elements of the Scheme below mean high water and consideration is necessary under the MW EIA Regulations.

4.1.3 The EIA process

The stages of the EIA process are as follows:

- Screening – determine whether EIA is required;
- Data Review – draw together and review available data;
- Scoping – identify significant issues, determine scope of EIA;
- Baseline Surveys – undertake baseline surveys and monitoring;
- Assessment and iteration – assess likely significant effects of development, evaluate alternatives, provide feedback to design team on adverse effects, incorporate any necessary mitigation, assess effects of mitigated development; and
- Preparation of the ES.

4.2 Screening

The Scheme does not fall within Annex 1 of the EIA Directive (Schedule A1 of the MW EIA Regulations, Schedule 1 of the T&CP EIA Regulations), within which EIA would be mandatory.

However, the Scheme does fall under Annex 2 of the EIA Directive (Schedule A2(69) in the MW EIA Regulations, Schedule 2 Clause 10(m) of the T&CP EIA Regulations) – Infrastructure Projects, which includes certain coastal works (including land reclamation):

- *"Coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dykes, moles, jetties and other sea defence works, excluding the maintenance and reconstruction of such works".*

While in the EIA Regulations for coastal works there is no minimum area limit for triggering EIA (all development has to be considered), Welsh Office Circular 11/99 identifies the 'Indicative Thresholds and Criteria for identification of Schedule 2 Development Requiring EIA' determining significant effects as detailed in Table 4.1.

Table 4.1: Indicative criteria and threshold

Development type	Schedule 2 criteria and thresholds	Indicative criteria and threshold
Coastal works to combat erosion and maritime works capable of altering the coast	All development	Works would exceed 1ha.

Source: Welsh Office Circular 11/99

The maximum area of coastal defence works including beach recharge totals approximately 74ha (this includes any spot recharge and beach management required in the Phase 1 area), with a maximum possible marine working area of approximately 372ha (although in practice it is anticipated that only a small portion of this area would actually be used during construction) which exceeds the indicative criteria and threshold of 1ha. An additional approximately 5ha of landward promenade and highway improvements are also proposed.

Therefore, the requirement for EIA needs to be established, based on whether the Scheme is considered to have potential 'significant' effects on the environment.

A screening opinion was requested from CCBC on 2nd November 2020 and a response was received on 1st December 2020 (included as Appendix A) confirming that an EIA would be required for the Scheme for the following reasons:

1. *"Paragraph A29 of Circular 11/99 states that EIA will be more likely where the area of works would exceed one hectare. The maximum area of coastal defence works including beach recharge totals approximately 59 hectares (*Note: The area has been revised upwards since this time to include spot recharge to the east towards Porth Eirias as stated above*), which significantly exceeds the indicative threshold of 1 hectares.*
2. *Paragraph 37 of the Circular states that the likely environmental effects of Schedule 2 development will often be such as to require EIA if it is to be located close to conservation sites, including Special Protection Areas. The site lies within 100m of Liverpool Bay/Bae Lerpwl Special Protection Area (SPA) and whilst beach recharge works would not extend into the SPA, boat and pipeline movements would need to take place within its boundary. The proposed development could have potentially significant impacts on the ecological value of this designated area arising from demolition, excavation, deposition of material, haulage movements, sediment disturbance and potential contamination.*
3. *The Promenade and beach form recreational and tourism assets which make a significant contribution to the economic and social well-being of Colwyn Bay. The proposal could have potentially significant impacts on the appearance, amenity and accessibility of those assets.*
4. *By virtue of its size, nature and location, the proposed development could have potentially significant impacts on the environment, including impacts upon hydrodynamics, flooding, erosion, contamination, water quality, marine habitats/species and the economic and social value of Colwyn Bay Promenade and beach."*

4.3 Scoping

As discussed in Section 1.3, under Regulation 15 of the T&CP EIA Regulations and Regulation 13 of the MW EIA Regulations, a Scoping Opinion can be requested from the appropriate authority to determine the scope and level of detail required in the ES.

According to Regulation 15 of the T&CP EIA Regulations and Schedule 4 of the MW EIA Regulations, the Request for a scoping opinion must be accompanied by:

1. A chart, plan or map sufficient to identify the land, location of the regulated activity and of other activities to be carried out in the course of the project/development;
2. A brief description of the nature and purpose of the project/development, including its location and the regulated activity;
3. An explanation of the likely significant effects of the development on the environment; and
4. Such other information or representations as the applicant may wish to provide or make.

The above information is provided within this ES Scoping Report.

5 Consultation

5.1 Consultation completed to date

The Applicant has completed extensive consultation the previous Colwyn Bay Waterfront Project phases. The high level proposals have been known and included in all ESs and non-statutory environmental reporting to date over the past decade with numerous consultation exercises completed within CCBC.

In addition the this the following specific consultation has been undertaken:

5.1.1 Bay of Colwyn full council meeting (October 2019)

Council officers working on the Scheme attended to give a summary of the work completed to date and an overview of the development of the Phase 2b plans. It was made clear at the outset that at present no funding had been identified or secured for the promenade works, and it had been indicated by Welsh government that the beach recharge scheme may be eligible for CRMP funding.

A presentation surmising the work completed to date and some of the initial concept proposals was given. Potential amendments to the traffic flow and road layouts were shared, concluding with confirmation of the next steps for the Project Team.

The presentation was well received, and the following notes from the meeting have been provided by the Applicant:

- *"If the traffic flow is to be altered, the priority at the junctions of the Cayley Embankment needs to be looked at.*

It was confirmed this would be assessed as part of the Road Safety Audits which would take place. Traffic Counts were also being arranged for during the current closure to gauge volume of traffic across the embankment.

- *Believed funding would be difficult to come by as the majority of previous project funding to date had come from European sources.*

It was acknowledged that the majority of funding had come from European sources in the past and the likelihood was that any future project would be likely be funded from various smaller pots as opposed to one or two large funds. Work was ongoing to identify any potential sources of funding.

- *If the concessions are to be developed can consideration be given to provision of indoor seating such as the facility in Porthcawl, felt opportunity was missed with new concession building on headland three.*

Reiterated that there was currently no funding for the renewal of the concession buildings, but comments would be taken on board.

- *In terms of ecology it was felt the groyne at Porth Eirias had negatively impacted some rock pools east of the groyne and the bio-block had been buried in sand so had not had any positive impact. It was asked that the impact of further sand importation was carefully considered.*

Officers confirmed that if deemed necessary an EIA would be carried out. CCBC would work closely with the design team and NRW to ensure that potential impacts were identified and suitable mitigation was implemented.

- *Supportive of the idea of re-wilding the embankment, this had been done elsewhere very successfully. Also the idea of utilising the embankment for seating was welcomed.*

The wilding up was something that would be seriously considered as it aligned with a number of Conwy's strategic objectives / directives. In terms of the seating the feasibility of this would depend heavily on the traffic flow along the bottom of the embankment and safety considerations."

5.1.2 SP Energy Networks (October 2019)

SP Energy Networks have been contacted regarding the sub-station and potential external renovations. They are supportive and willing to work with the Applicant to improve the aesthetic of the substation.

5.1.3 The Drinking Fountain Association (November 2019)

The Drinking Fountain Association have been consulted regarding the potential to refurbish an existing historical fountain adjacent to the Cayley Embankment. They have indicated they may be willing to offer a grant towards this.

5.2 EIA Scoping consultation

On receipt of this Scoping Report, CCBC would consult with statutory and non-statutory consultees in order to provide a robust Scoping Opinion.

The following are considered statutory consultees for the purposes of EIA:

- CCBC;
- NRW;
- Cadw; and
- Crown Estates.

A number of other consultees would also be consulted by CCBC and/or the Applicant on the Scoping Report. The organisations to be consulted directly on the Scoping Report would be identified in consultation with CCBC, and are likely to include:

- Network Rail;
- Dŵr Cymru;
- Scottish Power;
- Sustrans;
- Local anglers' associations;
- Clwyd Powys Archaeological Trust;
- Colwyn Bay Town Council;
- Conwy Access Group; and
- North and Mid Wales Trunk Road Agent (NMWTRA).

The Scoping Opinion and comments received from Council officers and consultees would be taken into account in the EIA and in preparing the ES. The ES would summarise the comments received and describe how the feedback influenced the scope of the EIA and ES. When submitted, the ES would be publicised by CCBC and subject to consultation with the above organisations, other notified parties, and the public.

In accordance with the EIA Regulations, CCBC have a 5-week period to consider this report and adopt a formal Scoping Opinion.

5.3 Future consultation

Given the current restrictions relating to Covid-19, it is proposed that an online public information event would take place in the near future, to be followed by a physical event as and when restrictions are lifted.

6 Potential for Cumulative Effects

6.1 Overview

The EIA Regulations require the assessment of the likely significant effects from the cumulation of effects with other existing and/or approved projects.

A full assessment would be completed as an ES chapter, however at the current time, the principal potential for cumulative impacts during operation is when the Scheme is considered in the context of the wider Colwyn Bay Waterfront Project which have already provided improved coastal protection from Porth Eirias westwards, through the Phase 1a/b/c and 3 areas.

The projects to be assessed cumulatively with the Scheme would be agreed in advance with CCBC and other key consultees, and are considered likely to include:

- Colwyn Bay Waterfront Project – Phase 3 (Old Colwyn Coastal Defence and Active Travel Scheme). This Scheme is anticipated to begin construction shortly and will progress in phases (funding allowing) over the next few years, comprising the construction of a 30m deep rock revetment along the base of the sea wall from Porth Eirias to join with the Splashpoint Project to the east with associated outfall extensions and new pedestrian accesses to the beach. It also includes active travel improvements to include new cycleway layouts, improved pedestrian access areas, improved lighting, new handrailing and improved signage along with other promenade improvements which are yet to be finalised;
- Rhôs Point Development – restaurant, café and retail unit to the north of Rhôs Harbour (timescales are currently unknown); and
- Other coastal defence schemes progressing within Conwy including Llandudno, Penrhyn Bay, Llanddulas and Kinmel Bay (and other coastal projects with similar deadlines in surrounding counties which may have, for example, similar materials requirements) which may have construction periods overlapping with the Scheme construction period.

Construction work on the Colwyn Bay pier is anticipated to be complete before Scheme construction would begin and therefore would not be included in the cumulative impact assessment.

6.2 Cumulative effects chapter

The EIA Regulations require the consideration of the potential impacts of:

- Inter-relationships of different environmental disciplines; and
- Cumulative effects of other existing and/or approved development.

The EIA would consider as appropriate the potential for impact interactions leading to a cumulative environmental effect on a receptor being greater than each of the individual effects that have been identified.

A review of all committed developments (including both approved schemes and applications yet to be determined) within the locality of the Scheme would be completed and recorded.

7 Air Quality

7.1 Introduction

This Chapter sets out the proposed scope for the assessment of the potential effects of the Scheme on air quality, namely:

- Nuisance, loss of amenity and health impacts caused by construction dust. These have been considered in line with the Institute of Air Quality Management's (IAQM) *'Guidance on the assessment of dust from demolition and construction'*[3]; and
- Air quality impacts caused by additional traffic generation and changes to traffic routing during construction and operation of the Scheme, in line with the Environmental Protection United Kingdom (EPUK) and the IAQM[4] *'Land-Use Planning and Development Control: Planning for Air Quality*' guidance.

The requirement to assess potential effects from dust deposition, and changes in concentrations of nitrogen dioxide (NO_2) and particulate matter (PM_{10}[5] and $PM_{2.5}$ [6]) only are considered, as these are the key pollutants associated with the Scheme.

7.2 Study area

For potential impacts related to dust and PM_{10} from construction, the study area for the air quality assessment would cover human health receptors within 350m and ecological sites within 50m of the Scheme boundary.

For potential impacts related to changes in concentrations of NO_2, PM_{10} and $PM_{2.5}$ from traffic, human health receptors and designated ecological sites within 200m of roads that meet the EPUK and the IAQM[7] criteria would be considered. The criteria are:

- A change of Light Duty Vehicles (LDV) flows of more than 500 Annual Average Daily Traffic (AADT); and/or
- A change of Heavy-Duty Vehicles (HDV)[8] flows of more than 100 AADT.

Where the above criteria are met, sensitive human and ecological receptors, at worst-case[9] locations up to 200m from an affected road would be assessed.

7.3 Baseline conditions

Information on air quality in the UK can be obtained from local authorities, national network monitoring sites and other published sources. The baseline data most representative of the Scheme has been obtained from the North Wales Combined Authority Air Quality Progress Report 2020[10] and Defra[11]. The most recent full year of monitoring data available is for 2019.

[3] Institute of Air Quality Management (2014) Guidance on the assessment of dust from demolition and construction.

[4] Environmental Protection UK and Institute of Air Quality Management (January 2017) Land-Use Planning and Development Control: Planning for Air Quality (version 1.2)

[5] Particulate matter with a diameter of less than 10 microns

[6] Particulate matter with a diameter of less than 2.5 microns

[7] Environmental Protection UK and Institute of Air Quality Management (2017) Land-Use Planning and Development Control: Planning for Air Quality (version 1.2)

[8] A heavy-duty vehicle is any vehicle with a gross weight greater than 3.5 tonnes and usually consists of HGVs, buses and coaches

[9] Worst case refers to locations that are closest to the road, roads with the largest flows, where the Scheme causes the greatest change in traffic or where ambient air quality is known to be poor.

[10] North Wales Combined Authority (2020) Air Quality Progress Report 2020.

[11] Defra (2018). Background mapping data for local authorities. [Online] Available at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018 Accessed March 2021.

7.3.1 Local authority monitoring

CCBC has declared no Air Quality Management Areas (AQMAs)[12] for its administrative area as there are no monitored exceedances of the relevant national objectives.

CCBC has no automatic monitoring stations and monitors NO_2 using passive diffusion tubes at 20 locations within Conwy County Borough. Four diffusion tube sites are located within 1.5km of the Scheme, the monitoring data for which are presented in Table 7.1.

No exceedances of the NO_2 annual mean objective have been recorded at any of the nearby diffusion tube locations. The highest 2019 concentration, measured at Theatre Colwyn, is 17.4µg/m^3, less than half of the annual mean objective of 40µg/m^3.

Table 7.1: Air quality monitoring data for NO_2

Site ID	Site name	Site classification	National Grid Reference		Annual mean concentration (µg/m^3)			
			X	Y	2016	2017	2018[a]	2019[b]
DT/CCBC001	Theatre Colwyn, Colwyn Bay	Roadside	285119	378817	19.1	16.9	18.6	17.4
DT/CCBC017	Kingsway, Colwyn Bay	Roadside	284526	379417	24.4	16.5	17.3	16.3
DT/CCBC033	Coed Pella Rd, Colwyn Bay	Roadside	284789	378985	13.7	13.0	14.0	12.4
DT/CCBC035	Ysgol Bod Alaw, Colwyn Bay	Roadside	285506	378295	-[b]	15.5	16.5	16.1

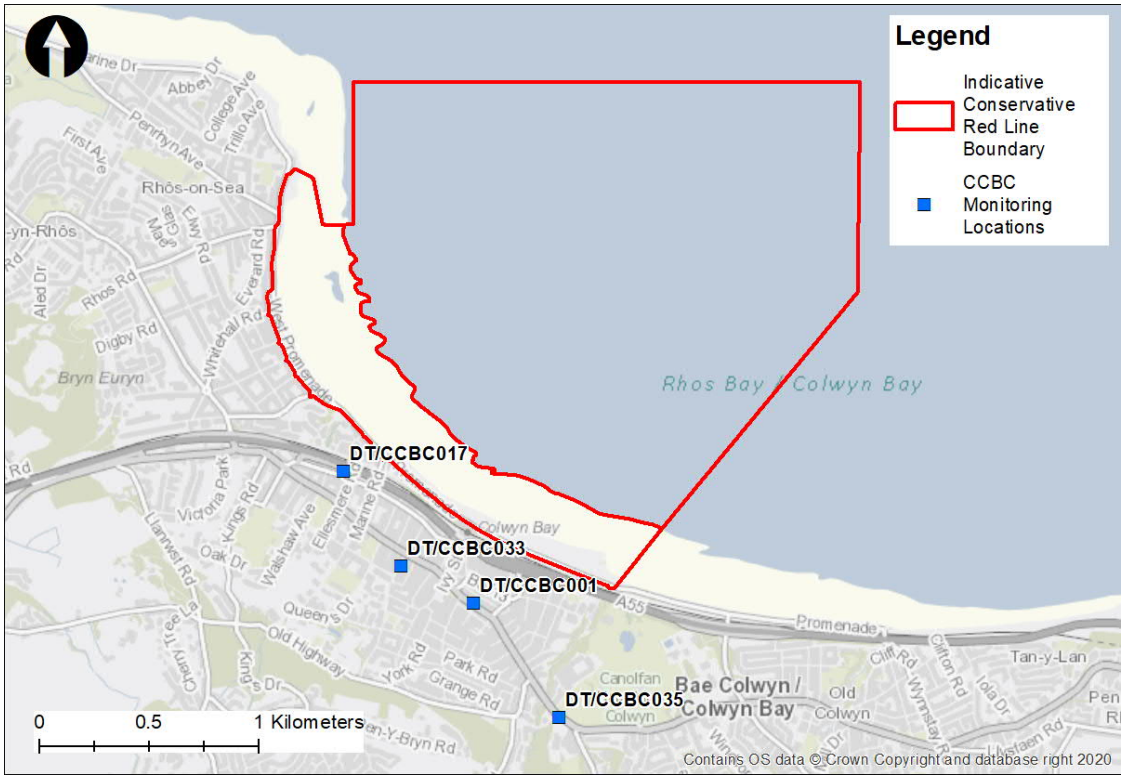
Source: North Wales Combined Authority, 2020
Note: [a] In 2018, data capture for all sites was100% and bias adjustment factor was 0.76.
[b] In 2019, data capture was 66% at Theatre Colwyn, and 100% for all other sites. Bias adjustment factor for 2019 was 0.75.
[c] Monitoring at this location began in 2017

The locations of these sites are presented in Figure 7.1.

Note: The RLB used is an initial conservative boundary including all potential areas for access, construction compounds and working areas. It therefore represents a worst-case scenario.

[12] Part IV of the Environment Act 1995 requires local authority to periodically carry out a review of air quality within its area. As part of this review, the authority must assess whether air quality objectives are being achieved. Locations where they are not or are unlikely to be achieved within the relevant period must be identified and declared as an Air Quality Management Area (AQMA).

Figure 7.1: Local authority monitoring locations



Source: North Wales Combined Authority, 2020

7.3.2 Defra projected background concentrations

Defra provides mapped future year projections of background pollution concentrations for NO_X, NO_2, PM_{10} and $PM_{2.5}$ for each 1.0km grid square across the UK for all years between 2018 to 2030[13]. The maps include a breakdown of background concentrations by emission source, including road and industrial sources, which have been calibrated against 2018 (the baseline year) UK monitoring data. Table 7.2 presents background concentrations for the 1.0km grid squares containing the Scheme in the current year of 2021. The maximum background concentrations at the site are all within the relevant objectives.

Table 7.2: Projected background concentrations (µg/m^3) of NO_x, NO_2, PM_{10} and $PM_{2.5}$ (maximum concentrations across Scheme area)

Pollutant	2021
NO_x	10.6
NO_2	8.3
PM_{10}	10.3
$PM_{2.5}$	6.6

Source: Defra (2018)
Note: The background concentrations shown are for the 1.0km square centred on 284500, 379500.

7.3.3 Summary

The closest monitoring locations to the Scheme met the annual mean NO_2 objective in 2019. The monitoring sites are located in Colwyn Bay Town Centre where there are several busy

[13]Defra Background maps (2018) [Online] Available at: https://uk-air.defra.gov.uk/data/laqm-background-maps, Accessed March 2021

intersecting roads, as opposed to the Site where there is a road adjacent to the seafront, backed by the NWC Railway Line embankment to the east with a higher likelihood of emissions being more readily dispersed. It is, therefore, likely that the objectives are met at the Site.

CCBC does not monitor particulate matter (PM_{10} and $PM_{2.5}$) but it is recognised that where concentrations of NO_2 are low and road traffic is the primary source of emissions, the concentration of PM_{10}/$PM_{2.5}$ would also likely be lower than the air quality objectives. In the case of the Scheme, another primary source of particulate matter is contributions from sea salt due to its coastal location. It can be seen in the Defra predictions, however, that these are not expected to exceed the objectives for PM_{10} or $PM_{2.5}$.

Defra's TG16[14] document indicates that the hourly NO_2 air quality objective of 200µg/m^3 (not to be exceeded more than 18 times per year) is unlikely to be exceeded at roadside locations where the annual mean concentration is less than 60µg/m^3. Following this guideline, the hourly objective is therefore considered to also be met, as the monitored mean NO_2 concentrations are less than 60µg/m^3.

The Defra predictions indicate that the background concentrations at the Scheme site are unlikely to exceed the relevant objectives.

7.4 Assumptions and limitations

The number of LDV and HDV movements required and the traffic management measures during the construction and operational phases are currently unknown.

In scoping in construction traffic, assumptions have been made that the Scheme may lead to an increase in construction vehicle movements exceeding the EPUK/IAQM thresholds and assessment of local air quality during the construction phase would be required. This is due to the anticipated closure of sections of the Promenade for an extended period during construction and the associated redistribution of vehicles on the public highway.

In scoping in operational traffic, assumptions have been made that the Scheme:

- Could lead to changes in operational vehicle movements on Cayley Promenade and West Promenade and surrounding roads exceeding the EPUK/IAQM thresholds (given the preferred option for a one-way system in the Cayley Promenade and West Promenade area);
- Could lead to changes in the number of car parking spaces on the Promenade, and consequent change in the number of vehicles accessing through, and parking in, the surrounding area; and
- Would encourage usage of non-motorised transport along the Promenade due to improvements to the pedestrian and cycle path.

The scoping in of this discipline may be revised when more detailed traffic information and Scheme detailed design information is available.

7.5 Key guidance and best practice

The maximum concentrations of pollutants allowed in outdoor air (the 'limit values') are set in Wales by the Air Quality Standards (Wales) Regulations (2010)[15], as amended by the Air Quality Standards (Wales) (Amendment) (EU Exit) Regulations 2019[16].

[14] Defra (February 2018) Local Air Quality Management – Technical Guidance (16)

[15] Statutory Instrument. (2010), The Air Quality Standards (Wales) Regulations, No. 10011433 (W. 126)..

[16] Statutory Instrument (2019) Air Quality Standards (Wales) (Amendment) (EU Exit) Regulations 2019, No. 390 (W. 95).

The air quality objectives, specifically for use by local authorities in carrying out their air quality management duties, are set out in the Air Quality (Wales) Regulations 2000[17] and the Air Quality (Wales) (Amendment) Regulations 2002[18]. In most cases, the air quality objectives have the same numerical values as limit values although compliance definitions and dates differ.

The Welsh Government have published a 'Clean Air Plan' for Wales[19] to provide a framework for air quality improvements. Table 7.3 presents the relevant air quality objectives and limit values against which the Scheme would be assessed.

Table 7.3: Air Quality objectives and limit values

Pollutant	Averaging period	Air quality objectives and limit values		Attainment date	
		Concentration	Allowance	Air quality objectives	Limit values
Nitrogen dioxide (NO_2)	Annual	40 µg/m^3	-	31 December 2005(a)	1 January 2010(b)
	1-Hour	200 µg/m^3	18	31 December 2005(a)	1 January 2010(b)
Nitrogen oxides (NO_X)(c)	Annual	30 µg/m^3	-	-	31 December 2000(b)
Particulates (PM_{10})	Annual	40 µg/m^3	-	31 December 2004(a)	1 January 2005(b)
	24-Hour	50 µg/m^3	35	31 December 2004(a)	1 January 2005(b)
Particulates ($PM_{2.5}$)	Annual	25 µg/m^3	-	1 January 2015(a)	-
		20 µg/m^3	-	-	1 January 2020(b)

Notes: (a) Air Quality (Wales) Regulations 2000 as amended in 2002 and 2019.
(b) The Air Quality Standards (Wales) Regulations 2010.
(c) Designated for the protection of vegetation and ecosystems and referred to as the 'critical level' for NO_x.

It should be noted that the UK air quality objectives only apply at locations where members of the public might reasonably be exposed to pollutants for the respective averaging periods. Table 7.4 provides details of where the respective objectives should and should not apply and therefore the types of receptors that are relevant to the assessment.

Table 7.4: Locations where the air quality objectives apply

Averaging period	Objectives should apply at:	Objectives should not apply at:
Annual	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
24-Hour	All locations where the annual mean objective would apply, together with	Kerbside sites (as opposed to locations at the building façade), or any other location

[17] Statutory Instrument. (2000) Air Quality (Wales) Regulations, No. 1940 (W.138).
[18] Statutory Instrument. (2002) Air Quality (Amendment) (Wales) Regulations, No. 3182 (W.298).
[19] Welsh Government (2020) 'The Clean Air Plan for Wales, Healthy Air Healthy Wales'

	hotels. Gardens of residential properties.	where public exposure is expected to be short-term.
1-Hour	All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

Source: LAQM-TG16[20]

This scoping assessment has been carried out in accordance with the methodologies set out within:

- IAQM's '*Guidance on the assessment of dust from demolition and construction';*
- EPUK and IAQM's '*Land-Use Planning and Development Control: Planning for Air Quality'*; and
- Defra Local Air Quality Management Technical Guidance 2016 (TG16).

7.6 Potential effects

The potential impacts generated by the Scheme due to dust emissions arising from construction activities are unlikely to cause a significant effect if appropriate mitigation is in place as part of a CEMP. A dust risk assessment is required to determine the level of impact and the necessary mitigation measures.

It is considered unlikely that construction or operational traffic would cause a significant effect, but as options for routing of traffic in either phase have not been finalised, the impact of these on traffic emissions and air quality at sensitive receptors cannot be scoped out at this stage.

Table 7.5 summarises whether the impacts on air quality have the potential to cause significant effects, and whether they have been scoped in or out of the ES.

7.6.1 Construction dust

The main risks to sensitive receptors during the construction phase include dust emissions arising from construction activities and construction vehicle movements. Dust can arise from numerous construction activities such as concrete-batching, piling, wind erosion on material stockpiles and earth-moving activities. It can be mechanically transported either by wind or through the movement of vehicles onto the public highway (transport of debris on vehicle wheels, or uncovered loads).

There are human health receptors within 350m (immediately adjacent) and ecological receptors within 50m extending within) of the Scheme boundary, including the statutory Liverpool Bay / Bae Lerpwl (Wales) SPA, which is located within the Scheme RLB.

Whilst unlikely to lead to significant effects following appropriate mitigation, a dust risk assessment would be undertaken to determine the risk of nuisance and the level of mitigation

[20] Department for Environment, Food and Rural Affairs (2018), Local Air Quality Management – Technical Guidance (16)

required. The dust risk assessment would be carried out in accordance with the IAQM guidance[21].

7.6.2 Construction site plant emissions

Construction can require the use of different equipment such as excavators, cranes and on-site generators. All construction plant has an energy demand; with some plant resulting in direct emissions to air from exhausts. Guidance from the IAQM notes that effects from on-site plant exhausts would likely not be significant. Given the nature of the site plant, effects of plant emissions on local air quality are considered of negligible significance relative to the surrounding road traffic contributions on the local road network. Construction plant emissions have therefore been scoped out of the ES as the impacts would likely be *de minimis*.

7.6.3 Construction traffic

The construction phase of the Scheme has the potential to impact upon air quality due to:

- Road closures on the section of the West Promenade between Porth Eirias and Rhôs-on-Sea Beach. The closures may be partial or total and potentially phased over the anticipated 12 months construction period and would redistribute traffic from the Promenade onto other local roads, closer to sensitive receptors; and
- Changes in emissions associated with changes in traffic flows along affected roads (including composition and speed) on the local road network, as a result of road closures.

At this stage, there is no detailed information pertaining to construction traffic movements or traffic management measures. When available, they would be scoped against best practice indicative criteria for requiring an air quality assessment as suggested by EPUK/IAQM guidance[22].

There is the potential for adverse effects on local air quality at sensitive human and ecological receptors. The likelihood of significant effects is dependent upon baseline ambient air quality and the number of construction traffic movements or traffic management measures. It is considered likely that given the scale of the Scheme it may be phased which would reduce overall effects. Specific measures for the mitigation of effects including the careful selection of construction traffic and diversion routes would be undertaken in consultation with CCBC.

Based on the above, it is proposed that the ES would scope in the assessment of construction traffic and traffic management measures, however, the scoping in of this discipline may be revised when more detailed construction traffic information is available.

7.6.4 Operational traffic

As detailed in Section 17, increased travel demand to the area could result in an increase in motorised traffic in the area, but this is considered unlikely, as the additional demand would be off-set by improvements to active travel routes and increase access by walking and cycling.

The preferred option for routing traffic on West Promenade and Cayley Promenade is the creation of a new one-way system. Whitehall Road and the northern section of Cayley Promenade are currently used as an access route to Rhôs-on-Sea beach and adjacent areas from the south, as well as directly to the Scheme area. Changes to traffic routing on these roads are likely to affect how traffic circulates in the residential area between Cayley Promenade and Brompton Avenue.

[21] Holman et al (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. www.iaqm.co.uk/ text/guidance/construction-dust-2014.pdf

[22] Moorcroft and Barrowcliffe. et al. (2017) Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London.

All options also include changes to the number of parking bays on the Promenade, which also have the potential to influence the number of motorised trips to and from the Scheme and the surrounding areas.

Changes to traffic in the operational phase would have the potential to impact upon air quality due to:

- Changes in emissions associated with changes in traffic flows along affected roads (including composition and speed) on the local road network, as a result of changes to road layout, traffic routing, and number of parking bays available.

At this stage, there is no detailed information pertaining to the impact of the Scheme on traffic flows. When available, these would be scoped against best practice indicative criteria for requiring an air quality assessment as suggested by EPUK/IAQM guidance[23].

There is the potential for adverse effects on local air quality at sensitive human receptors in neighbouring residential areas. The likelihood of significant effects is dependent upon baseline ambient air quality and the magnitude of change in traffic flows. Further assessment of the different options and their impacts on air quality would be undertaken if changes to traffic flows exceeded the EPUK/IAQM criteria. Consultation with CCBC and the local community regarding the different options are under way.

Based on the above, it is proposed that the ES would scope in the assessment of operational traffic, however, the scoping of this discipline may be revised when a preferred option is chosen, and more detailed operational traffic information is available.

7.6.5 Summary of potential effects

Table 7.5 presents whether construction or operational effects have currently been scoped out of the ES. A confirmatory scoping opinion is requested from all relevant statutory consultees.

Table 7.5: Potential effects

Effects	Construction	Operation
Effects Potentially Not Significant	Construction dust – adverse effects on human and ecological receptors due to dust impacts*.	N/A
Effects Potentially Significant	Construction traffic – adverse effects on human and ecological receptors due to air quality impacts. Significant air quality effects in relation to the use of Traeth Pensarn above mean high water as a pipeline construction area are not currently anticipated, however given the lack of data at this time as to whether this area would be used or not, it has been scoped in for further consideration at the ES stage.	Operational traffic– adverse effects on human receptors due to air quality impacts.**
Scoped In/Out	**Scoped In**	**Scoped In****

Source: Mott MacDonald Ltd, 2020

*However a construction dust risk assessment would be required.

[23] Moorcroft and Barrowcliffe. et al. (2017) Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London.

**Should operational traffic flows not be altered in the Cayley Promenade and West Promenade area (maintenance of two-way traffic flows along West Promenade), then operation air quality effects would be likely to be scoped out.

7.7 Additional information and assessments/reporting required in support of the ES

A Transport Report (TR) would be required to provide additional clarity on the vehicle distribution across local roads during closure of the Promenade during construction and on potential effects of changes to traffic routing on Cayley Promenade and West Promenade. This would enable a revised scoping to be undertaken and, if necessary, further assessment within the ES.

A Construction Dust Risk Assessment would also be required.

7.8 Proposed methodology

The proposed methodology for the assessment of Air Quality effects can be found in Appendix C.1.

8 Archaeology and Cultural Heritage

8.1 Introduction

This Chapter sets out the proposed scope for the assessment of the potential effects of the Scheme on archaeology and cultural heritage. Construction of the Scheme has the potential to affect archaeological remains.

For the purpose of this assessment, the historic environment encompasses three sub-topics as defined by the Design Manual for Roads and Bridges (DMRB) as:

- Archaeological Remains (including scheduled monuments, protected wrecks, aircraft crash sites and non-designated assets);
- Historic Buildings (listed buildings, non-designated buildings, conservation areas); and
- Historic Landscapes.

This resource is considered to include listed buildings, conservation areas and non-designated features of national, regional or local archaeological, historical or architectural value. These features include archaeological remains, palaeo-environmental deposits and historic buildings. There are no world heritage sites, scheduled monuments, protected wrecks, registered battlefields or registered parks and gardens within the Study Area and therefore they would not be considered within the EIA.

The assessment to be presented within the EIA would describe the baseline historic environment resource within the Study Area and consider the potential for previously unrecorded historic assets within the Study Area. It would describe how the proposals impact on this resource and assess the significance and severity of the effects arising from both the construction and operational impacts.

Mitigation measures would be recommended where appropriate. The assessment would conclude with the significance of the residual effects taking into account this mitigation. Indirect, cumulative impacts and secondary effects would also be assessed, and the assessment would draw on the conclusions from other disciplines, notably landscape and visual amenity, noise and vibration.

8.1.1 Reference reporting

- Colwyn Bay Waterfront Project, Archaeological and Historical Assessment, Birmingham Archaeology October 2010 (Appendix E).

8.2 Study area

The Study Area consists of a buffer from the Scheme boundary, which extends across the intertidal zone north and east of the Scheme and part of Colwyn Bay town and Rhôs-on-Sea to the south and west[24]. This allows a consideration of all known heritage assets which may indicate the presence of further unrecorded remains within the Scheme boundary. This is considered a wide enough area to take into account any impacts on designated heritage assets and their setting.

[24] A bespoke buffer was adopted for the heritage desk-based assessment carried out by Birmingham Archaeology (2010). The buffer zone around the site was designed to cover an area from the waterfront to the normal Low Tide Mark and from the waterfront to c. 200m inland.

8.3 Baseline conditions

The Scheme is located between Colwyn Bay (Porth Eirias) in the east and Rhôs-on-Sea in the west and comprises coastal defence works in the form of beach recharge, in combination with promenade improvements to facilitate regeneration (See Section 2). The existing coastal defences were constructed in the late 19th century and in general comprise stone and timber groynes and vertical seawalls in either masonry or concrete. During the 20th century, the defences required ongoing maintenance and repairs to ensure their integrity and stability. Since the 1990s routine maintenance of the existing structures has been carried out to extend their residual life.

8.3.1 Geology

The town of Colwyn Bay stands at the foot of a steep crescent scarp of Carboniferous limestone rocks. The upper edge of the scarp lies approximately 7.0km inland from the coast and reaches around 150m AOD at its highest. The waterfront lies at 6m AOD, and the beach at between 4m and 0mAOD. The geology of the area is a blue-grey Till overlain by sands. The beach extends to a distance of 250m from the waterfront at low tide and consists of a fine yellow sand[25].

8.3.2 Historic mapping and aerial imagery

A search of available historic Ordnance Survey mapping (Table 8.1) shows that up until the end of the 19th century the Study Area was largely rural. The small town of Colwyn Bay formed the main centre of settlement with a piecemeal pattern of cottages along the coast at Rhôs-on-Sea (Llandrillo-yn-Rhôs). The development of transport systems including both the railway constructed by the Chester and Holyhead Railway Company in 1848, and a tramline constructed in 1906, was a catalyst to the development of Colwyn Bay as a seaside resort. By the early 20th century, Colwyn Bay had become a much larger town and both the promenade and Victoria Pier had been established. Urban development spread west of Colwyn Bay and to the north around Rhôs-on-Sea throughout the 20th century[26].

Table 8.1: Historic mapping summary (within scheme boundary)

Date	Map	Development
1874	Llandrillo-yn-Rhôs Tithe Map	The study area is almost wholly rural at this time. The small town of Colwyn Bay to the south-west of the study area is the main centre of population. A road network exists inland from the shore, with a north-west to south-east road forming a basis for the later development of the town as depicted on subsequent maps. Significantly, a transect through the landscape is marked on the plan outlining the route of the planned railway. This is listed in the apportionment as belonging to the Chester and Holyhead Railway Company.
1891	Ordnance Survey Denbighshire III	The London and North Western Railway is shown running along the coastline before sweeping to the west mid-way along the study area. The area remains largely rural at this date and is characterised by fields, woodlands and a scattering of cottages. The main focus of settlement is at the town of Colwyn Bay, just outside the study area in the east. Further to the north a bath house is located adjacent to the shoreline with an access track running to the west. The remaining area to the north is characterised by cottages and small fields. It is notable that one cottage, just outside the study area at Llandrillo-yn-Rhôs, is named 'Weir View', suggesting the presence of fish weirs on the shore.

[25] Geology of Britain viewer [Online] Available at: Geology of Britain viewer | British Geological Survey (BGS) Accessed March 2021

[26] Birmingham Archaeology. 2010, Colwyn Bay Waterfront Project, Archaeological and Historical Assessment,

Date	Map	Development
1901	Ordnance Survey Denbighshire III	Colwyn Bay is a larger town at this date with a clearly planned grid-like street pattern. An extended West Promenade is present in the area of Colwyn Bay Hotel and further development appeared to the west on the sea front. An east promenade has also been constructed by this date, running from the railway station mid-way towards the town of Colwyn. The railway station buildings at Colwyn Bay have expanded in size by this date. Features on the shore at Llandrillo-yn-Rhôs appear to mark wooden posts, as indicated on later maps. Linear groups of these features and sub-rectangular clusters extend onto the beach in this area and may represent fish weirs. Similar features, parallel with the shoreline are present around Colwyn Bay Hotel which most likely represent 'groynes'.
1915	Ordnance Survey Denbighshire III	Further urban development has occurred to the west of Colwyn Bay and to the north around Llandrillo-yn-Rhôs. The Victoria Pier is marked on the historic mapping for the first time, on which stood a Pavilion and a beacon. A Pavilion is also marked close to the Colwyn Bay Hotel. The promenade has been extended to the west as far as Llandrillo-yn-Rhôs and is split between two sections at its north-west end, accompanied by a band stand. To the east the promenade has been extended as far as the town of Colwyn. In the northern part of the study area at Llandrillo-yn-Rhôs, planned streets and housing are now present set back from the shore, with a small number of buildings fronting the promenade. A fish-weir structure is recorded on the shore at the northern part of the study area. A vague linear group of possible posts or stones are marked extending to the north-east, with a further sub-rectangular group of similar features to the south. Although these are not annotated, they appear to represent structures relating to fishing activities on the shore. Further 'groynes' and slipways are also recorded along the shoreline between Rhôs and the pier, and further possible stone or wood features on the shore east of the pier
1938	Ordnance Survey Denbighshire III	A greater density of planned urban development is notable between Colwyn Bay and Llandrillo-yn-Rhôs, with the two areas effectively forming one large town. Notable new features along the sea front at Colwyn Bay include a 'sports ground' adjacent to the West Promenade with an adjoining chapel, possibly associated with Penrhôs College. 'Eirias Park' is recorded south of the eastern promenade in the former location of Eirias House, present since at least 1847. The park contains a number of formal rectangular garden features, a pavilion and a lake. To the west of the park a large school has been set up by this date adjacent to East Parade. Shore features including fish weirs remain the same as the earlier mapping.
1954	Ordnance Survey Denbighshire III	The study area appears largely the same as earlier mapping with one notable exception. The fish weir east of the slipway marked Aber-hod in the north of the Study Area is depicted in more detail and appears to be formed from an 'L' shaped enclosure of posts/stones, similar to the tidal pond depicted on modern OS mapping.
2020	Google Earth Satellite Imagery	The timeline feature demonstrates the Phase 1 areas of beach recharge, terminal groin construction and promenade improvements to reinforce the beach defences within the last ten years.

Source: Historic Mapping[27]

8.3.3 Archaeology

The known archaeological resource of the Study Area, as described in the Colwyn Bay Waterfront Project archaeological and historical assessment[28], is summarised below and detailed in Table 8.2.

8.3.3.1 Designated assets

No world heritage sites, scheduled monuments, protected wrecks or registered battlefields are recorded within the Study Area.

8.3.3.2 Non-designated assets

A number of find spots have been recorded within the Study Area on the Clwyd-Powys Archaeological Trust (CPAT) Historic Environment Record (HER)[29]. These include a Neolithic stone axe recorded from the beach at Colwyn Bay (HER: 100457), and a Neolithic green-stone tranchet or chisel recorded from the 'Old ground surface' at Rhôs-on-Sea (HER: 10056). It may be possible that this find is from submerged forest deposits noted in this area, however the extent of these deposits is unknown. Approximately 900m to the north-west of the chisel a potential prehistoric peat deposit (58178) was recorded during archaeological monitoring carried out by Earthworks Archaeology in 2000 ahead of demolition of Rhôs-on-Sea Abbey Hotel. A Middle Bronze Age palstave has also been recorded at Colwyn Bay, although its provenance is not specific (HER: 35860).

A copper alloy brooch of possible late 1st century or early 2nd century AD (Flavian) date has been recorded on the beach at Rhôs-on-Sea (HER: 106447).

Just north of the Study Area, the site of an early medieval monastery (HER:100503) is recorded on land adjacent to the former Rhôs Abbey Hotel. Archaeological investigations undertaken in 1999 suggest that below ground remains associated with the former monastery are likely to have been destroyed by 19th and 20th century development (HER: 164227).

A fish-weir has been recorded on the shore south of Llandrillo-yn-Rhôs, which is made up of timber posts and rounded pebbles within a low bank. This structure encloses a sub-rectangular area marked by the Ordnance Survey as a tidal pond. The feature is thought to be medieval on the basis of comparisons with other similar structures along this coastline, although no specific dating evidence has been retrieved (HER: 34278). These weirs appear to have continued in use into the 20th century.

The Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) online catalogue of archaeology, buildings, industrial and maritime heritage in Wales (Coflein) also records a number of post-medieval wreck sites within the Study Area[30]. Archaeological remains associated with these vessels are not confirmed as present at the specific locations given but may be in the vicinity (See Table 8.2).

Two archaeological sites have been identified on the HER as pertaining to the modern period. The Colwyn Bay Hotel formed part of the earliest development of the town and was opened in 1871, although no longer survives (HER: 04550) and the remains of a building believed to be a 19th century fisherman's hut were uncovered on Ivy Street (HER:106489) in Colwyn Bay.

[27] National Library of Scotland Mapping resources: https://maps.nls.uk/, Accessed March 2021.
[28] Birmingham Archaeology. 2010, Colwyn Bay Waterfront Project, Archaeological and Historical Assessment,
[29] Archwilio Historic Environment Record of Wales: https://archwilio.org.uk/her/. Accessed March 2021
[30] RCAHMW: https://coflein.gov.uk/en/, Accessed March 2021

Table 8.2: Non-designated archaeological assets within the Study Area

HER No. / *RCAHMW No.	Site name/description	NGR	Period	Type
100457	Colwyn Beach Axe	SH 8600 7900	Neolithic	Findspot
100506	Rhôs-on-Sea , Abbey Hotel, Chisel	SH 8430 8070	Neolithic	Findspot
100505	Rhôs-on-Sea , Abbey Hotel, Axe	SH 8423 8076	Neolithic	Findspot
35860	Colwyn Bay Palstave	SH 8500 7900	Bronze Age	Findspot
106447	Rhôs-in-Sea Brooch	SH 8426 8022	Roman	Findspot
100503	Llandrillo-yn-rhôs Monastery	SH 842 807	Early Medieval	Archaeological Site
34278	Llandrillo-yn-rhôs Fish Weir	SH 8450 8030	Medieval and Post-medieval	Archaeological Site
34200	Rhôs-on-Sea Pier	SH 8430 8080	Post-medieval	Archaeological Site
106489	Colwyn Bay, Ivy Street Hut	SH 8508 7893	Post-medieval	Archaeological Site
58178	Rhôs-on-Sea , Abbey Hotel, Peat Deposit	SH 8423 8075	Unknown	Archaeological Deposit
104550	Colwyn Bay Hotel	SH 8475 7940	Modern	Archaeological Site
*515925	The Scotia	SH 84412 80368	Post-medieval	Wreck
*515977	The Hopewell	SH 84415 80223	Post-medieval	Wreck
*240063	The Mary Catherine	SH 84588 80230	Post-medieval	Wreck
*524875	The Ann	SH 84442 80120	Post-medieval	Wreck
*271679	The Pilot	SH84481 79932	Post-medieval	Wreck
*240068	Un-named Wreck	SH 84684 80039	Post-medieval	Wreck
*271293	The Betsy	SH84774 79903	Post-medieval	Wreck
*515976	The Antares	SH 84411 80324	Modern	Wreck

Source: Archwilio[31] and *Coflein[32]

8.3.4 Built heritage assets

8.3.4.1 Listed buildings

The National Historic Assets of Wales[33] records the following designated built heritage assets as falling within or immediately adjacent to the Study Area (Table 8.3).

Table 8.3: Listed buildings within the Study Area

HER No.	LB No.	Site name	Type	NGR	Period
123263	87661	The Imperial Hotel, 45 Station Road	Grade II	SH 8500 7908	Post-medieval
25324	25324	Victoria Pier	Grade II	SH 8527 7919	Modern

[31] Archwilio Historic Environment Record of Wales: https://archwilio.org.uk/her/, Accessed March 2021

[32] RCAHMW: https://coflein.gov.uk/en/, Accessed March 2021

[33] Cadw website: https://cadw.gov.wales/advice-support/cof-cymru/search-cadw-records, Accessed March 2021.

HER No.	LB No.	Site name	Type	NGR	Period
41138 - 45	14687-94	Princess Drive, Row of Shops	Grade II	SH 8497 7901	Modern
41148	14695-97	Princess Bingo and Social Club, 20 - 24 Princess Drive	Grade II	SH 8493 7914	Modern
41149	14698	Head Post Office, Princess Drive	Grade II	SH 8482 7926	Modern
41137	14686	Ridge Cottage, Penrhôs Road	Grade II	SH 8456 7953	Modern
-	87734	Former Pier Entrance	Grade II	SH 8430 8082	Modern

Source: Cadw[34]

8.3.4.2 Conservation areas

The CCBC Planning, Building Control and Conservation portal[35] records the following conservation areas as falling within, or adjacent, to the Study Area:

- Colwyn Bay Town Centre Conservation Area lies partially within the southern extent of the Study Area, separated from the Scheme by the A55 Expressway and NWC Railway Line. Of the 34 listed buildings contained within the conservation area, 9 fall within the Study Area. These include the Imperial Hotel and the row of 8 shops on Princess Drive;
- Old Colwyn Conservation Area lies just outside the Study Area, separated from the Scheme by the A55 Expressway and NWC Railway Line. None of the listed buildings within the conservation area fall within the Study Area; and
- Rhôs-on-Sea Conservation Area extends to the beach by Rhôs Jetty. There are no listed buildings in the conservation area. There are however important views down Rhôs Road and Penrhyn Avenue to the promenade and sea and the view towards the bottom end of Rhôs Road from the promenade.

8.4 Assumptions and limitations

- The Scheme would have no detrimental effect on the setting of the Colwyn Bay Town Centre Conservation Area, Old Colwyn Conservation Area, Rhôs-on-Sea Conservation Area, or any other designated assets;
- The Scheme would not have any significant effect on areas further along the coast which may affect the preservation of wreck sites;
- The available online resources and previous studies contain enough detail to make sound judgements;
- Designated data is up-to-date as of March 2021. Non-designated data supplied by Clywd-Powys Archaeological Trust as reported on in the previous desk-based assessment [36] dates to 2010. No surveys have been undertaken, but a visual inspection of the Study Area was undertaken on 12th March 2021. A review of the non-designated data held on Archwilio[37] and Coflein[38] was also undertaken in March 2021. In adherence to the conditions of use of Archwilio, up to date HER data would be requested from CPAT as part of the EIA;

[34] Cadw website: https://cadw.gov.wales/advice-support/cof-cymru/search-cadw-records Accessed March 2021

[35] Colwyn Couny Borough Council: https://www.conwy.gov.uk/en/Resident/Planning-Building-Control-and-Conservation/Conservation-and-Regeneration/Conservation-Areas/List-of-Conservation-Areas.aspx, Accessed March 2021.

[36] Birmingham Archaeology. 2010, Colwyn Bay Waterfront Project, Archaeological and Historical Assessment,

[37] Archwilio Historic Environment Record of Wales: https://archwilio.org.uk/her/, Accessed March 2021

[38] RCAHMW: https://coflein.gov.uk/en/, Accessed March 2021

- Where there is an absence of data, professional judgement would be used to reach informed decisions regarding the historic environment; and
- The current understanding of the extent and survival of archaeological remains within the Study Area is based on data relevant to the assessment which has been selected based on professional judgement. However, the specific nature, extent, date, degree of preservation and significance of known and unknown archaeological remains is difficult to predict without appropriate invasive investigation. The uncertainty in predicting impacts and effects upon such resources is inherent in all such studies and should be stressed.

8.5 Key guidance and best practice

The assessment would be carried out with due regard to the following key legislation and guidance:

8.5.1 Legislation

- Ancient Monuments and Archaeological Areas Act 1979;
- Planning (Listed Buildings and Conservation Areas) Act 1990;
- Protection of Wrecks Act 1973; and
- Historic Environment (Wales) Act 2016.

8.5.2 Guidance

- Technical Advice Note 24: The Historic Environment;
- Chartered Institute for Archaeologists (CIfA), Standards and Guidance (2014);
- Highways England, Design Manual for Roads and Bridges: LA 106 Cultural heritage assessment 2019; and
- Cadw best-practice guidance publications including, but not restricted to: Heritage Impact Assessment in Wales (2017), Managing Change to Listed Buildings in Wales (2017), Managing Change to Conservation Areas in Wales (2017), Managing Historic Character in Wales (2017), Managing Lists of Historic Assets of Special Local Interest (2017), Managing the Marine Historic Environment (2019), Setting of Historic Assets in Wales (2017).

8.6 Potential effects

The temporal scope of the assessment assumes a baseline with current conditions at the time of writing the ES. Both temporary and permanent effects from the construction and operation phases of the Scheme would be considered within the assessment.

Permanent effects are considered to be any physical impacts to designated and non-designated historic buildings and archaeological remains within the land required for the Scheme, alterations to the setting of listed buildings and visual and noise impacts caused by the operational phase of the Scheme.

Temporary effects are considered to be construction activity such as, increased noise or the visibility of heavy plant, which would be removed upon completion. It would equally include the construction of compounds which would be removed after the completion of works.

The Scheme has the potential to impact upon non-designated archaeological remains, which are located within the Study Area. Due to the proximity of heritage assets to the Scheme, there is potential for further archaeological remains to be present within the Study Area.

There would be potential short term, temporary effects on any known built heritage sites, designated assets or listed buildings or their settings, depending on the location of site

compounds and construction traffic routes. The design, nature and overall aim of the Scheme itself is unlikely to have any long-term visual effects.

The full extent of the potential environmental impacts of the Scheme is not currently known and further mitigation would be required in advance of the production of the EIA to fully understand the potential impacts (see Section 8.7).

Table 8.4: Potential effects

Effects	Construction	Operation
Potential Non-Significant Effects	• Potential for discovery of previously unidentified archaeological assets. • Potential temporary setting impacts during construction phase.	None
Potential Significant Effects	• Potential for removal of archaeological remains. Mitigation would be recommended.*	None
Scoped In/Out	**In**	**Out**

Source: Mott MacDonald

* Significant archaeology and cultural heritage effects in relation to the use of Traeth Pensarn above mean high water as a temporary pipeline construction area are not currently anticipated, however given the lack of information at this time as to whether this area would be used or not, it has been scoped in for further consideration at the ES stage.

8.7 Additional information and assessments/reporting required in support of the ES

DMRB LA106 requires mitigation measures to be identified where *"remediation of a likely significant effect is necessary, as it cannot be avoided, prevented or reduced".* There are several mitigation measures that would need to be considered prior to the production of the ES. They would include:

- Archaeological assessment of geoarchaeological logs. A programme of geotechnical works is scheduled to be completed in late March 2021 and the results would be used to develop an archaeological model. This is intended to assess the extent and potential for peat and submerged land surfaces within the Study Area. This would feed into the ES and allow for appropriate mitigation measures to be proposed;
- Detailed design of the Scheme would be required in order to understand the potential impacts to known, and unknown, archaeological remains; and
- Consultation with Cadw, Conwy Conservation Officer, CPAT Planning Archaeologist and the RCAHMW Maritime Officer to discuss the potential requirement for further mitigation.

8.8 Proposed methodology

The proposed EIA methodology for the assessment of Archaeology and Cultural Heritage effects can be found in Appendix C.2.

9 Biodiversity

9.1 Introduction

This Biodiversity scoping chapter identifies the ecological features that can be significantly affected by the Scheme using ecological baseline data gathered from desktop records and field surveys.

The site itself comprises habitats of largely local value but there is significant ecological value in the habitats adjacent to the site, which form part of the Liverpool Bay / Bae Lerpwl SPA. There is potential for temporary construction effects on the SPA and the species it supports, which would require a Habitats Regulations Assessment (HRA).

9.1.1 Reference reporting

The ecological reports produced to date which cover the Scheme area include:

- Colwyn Bay: Preliminary Ecological Appraisal Report (20 February 2020) (included in Appendix E); and
- Colwyn Bay: Over Wintering Bird Survey Report (11 February 2020) (included in Appendix E).

9.2 Study Area

The current guidance on ecological impact assessments (EcIA) (Chartered Institute of Ecology and Environmental Management; CIEEM, 2018) has been applied to this EIA Scoping. This recommends that all ecological features that occur within a 'Zone of Influence' (ZoI) for a proposed development are investigated. The ZoI includes:

- Areas directly within the land take for the proposed development and access;
- Areas which would be temporarily affected during construction (to include pipeline construction location);
- Areas likely to be impacted by hydrological disruption; and
- Areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The ZoI is variable depending on the nature of the construction activities and the ecological receptors affected. For this assessment zones have been defined as outlined in Table 9.1.

Table 9.1: Zone of influence

Ecological feature	Zone of influence
Statutory designated sites – Marine	5.0km
Statutory designated sites – Terrestrial	2.0km
Non-statutory designated sites	2.0km
Protected species records	1.0km
Protected species evidence	Within the survey area

Source: Mott MacDonald Ltd, 2021

9.3 Baseline conditions

The Scheme baseline condition is assessed through considering the statutory and non-statutory designated sites as well as the ecologically valuable or protected habitats and species within

the ZoI. This has been informed by a desktop study, preliminary ecological appraisal (PEA), and overwintering bird surveys.

9.3.1 Designations

9.3.1.1 Scheme construction

A total of seven terrestrial statutory designated sites are present within 2.0km of the Scheme in addition to five non-statutory designated sites (these are listed in the PEAR; Appendix E).

Three marine statutory designated sites have been identified within 5.0km of the Scheme;

- Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC (located 3.0km north-west of the Scheme area);
- Creigiau Rhiwledyn/Little Ormes Head SSSI (located 2.8km north-west of the Scheme area); and
- Liverpool Bay/Bae Lerpwl SPA (located within the Scheme area).

The Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC is designated for its international importance for its habitats. Species listed under the SAC include the Allis and twaite shad (*Alosa alosa* and *Alosa fallax*), grey seal (*Halichoerus grypus*) and sea and river lampreys (*Petromyzon marinus* and *Lampetra fluviatilis*).

The Liverpool Bay/Bae Lerpwl SPA is designated for its international importance in supporting the water bird and seabird species and assemblages present, regularly supporting more than 1% of the British population of red-throated diver (*Gavia stellata*), 1% of the biogeographical population of common scoter (*Melanitta nigra*) and over 20,000 waterfowl during the non-breeding season.

The Creigiau Rhiwledyn/Little Ormes Head SSSI is designated for its geological, botanical, ornithological and marine biological features, supporting nationally important numbers of breeding cormorant (*Phalacrocorax carbo*). Additionally, the site supports breeding guillemot (*Uria aalge*), razorbill (*Alca torda*), kittiwake (*Rissa tridactyla*) and shag (*Phalacrocorax aristotelis*). The headland caves within the site are also historically known to support hibernating populations of the lesser horseshoe bat (*Rhinolophus hipposideros*)[39]. The intertidal area supports specialised and nationally scare biotopes such as unusually high numbers of the polychaete worm (*Polydora* sp.) with the anemone (*Sagartia troglodytes*) found at the bottom of the shore. This biotope is rarely described in the United Kingdom and this is the only recorded intertidal example.

Of the non-statutory designations, two local wildlife sites (LWS) are likely to be affected by the Scheme; Coed Rhôs Fossil Woodland, located within the Scheme area and Royal Fishing Weir, located directly adjacent.

All other statutory and non-statutory designations are considered sufficiently separated from the Scheme with no clear impact pathways. As such, these are considered unlikely to form a constraint to any proposals and are not considered further.

9.3.1.2 Pipeline construction

Of the two potential proposed locations for pipeline construction for the beach recharge element (Pensarn and Colwyn Bay) two statutory designated sites were identified; the Liverpool Bay/Bae Lerpwl SPA (discussed above) and Traeth Pensarn SSSI.

[39] Countryside Council for Wales, 2002. Creigiau Rhiwledyn/Little Ormes Head SSSI Site Citation Available at: CITATION (naturalresources.wales) Accessed March 2021

Traeth Pensarn SSSI is designated for its botanical interest as a vegetated shingle beach supporting pioneer species (such as yellow horned-poppy (*Glaucium flavum*), curled dock (*Rumex crispus*) and the locally rare sea kale (*Crambe maritima*) and stable vegetated species; sea fern-grass (*Catapodium marinum*), sea beet (*Beta vulgaris ssp. maritima*), sea campion (*Silene uniflora*) and sea mayweed (*Tripleurospermum maritimum*). The shingle extends over a 1.7km stretch of the beach from the promenade, westwards towards Llanddulas.

9.3.2 Habitats

The majority of the Scheme area comprises intertidal habitat dominated by sand[40]. Intertidal mud is located in the upper intertidal area behind the breakwater in Rhôs-on-Sea harbour. Other intertidal habitats present include shingle/cobbles and intertidal boulders/rocks comprising groynes extending out perpendicular to the shoreline. An area of standing water is located on the intertidal area, out from the slipway adjacent to the Cayley Kiosk and this comprises a post-medieval fish trap. An area of blue mussel (*Mytilus edulis*) beds is located within the Scheme area.

The southern areas of the site, beyond the revetment, comprise hardstanding and structures (including the promenade and cycleway, with multiple structures including bus shelters, kiosks, NWC Railway bridges and public convenience blocks*)* along with associated amenity grassland and landscaped trees.

Other habitats present include areas of amenity grassland, scrub and tall ruderal vegetation, largely associated with the NWC Railway embankment. The majority of these habitats are considered to be of low ecological value and do not pose a constraint*.*

The following habitats are considered to be of elevated value in the context of the Scheme and could qualify as priority habitats (as listed under Section 7 of the Environment (Wales) Act):

- Subtidal sands and gravel; and
- Blue mussel (*Mytilus edulis*) beds on mixed substrate.

Further information regarding potential priority habitats present within the Scheme would be ascertained during an intertidal survey to be completed prior to the end of March 2021.

9.3.3 Protected species

A number of protected species have been identified from records provided by North Wales Environmental Information Service (Cofnod), many of which have the potential to be present in the habitats within the survey area, with some confirmed on site. Based on the records returned and the PEA[40], the species considered to be potential constraints for the Scheme are:

- Roosting and foraging bats;
- Reptiles;
- Nesting and wintering bird species;
- Fish;
- Marine mammals; and
- Marine invertebrates.

Overwintering bird surveys undertaken from November 2019 – January 2020 confirmed the presence of two species which are designated features of interest within the Liverpool Bay/Bae Lerpwl SPA (common scoter and red throated diver)[41]. Other designated interest features for the Liverpool Bay/Bae Lerpwl SPA include little gull (*Hydrocoloeus minutus*), little tern (*Sternula*

[40] Mott MacDonald Ltd, 2020. Colwyn Bay Preliminary Ecological Appraisal Report. Reference: 410895-MMD-N-R-00-XX-1701

[41] Over Wintering Bird Survey Report, Mott MacDonald Ltd, February 2020. Document reference: 410895-MMD-N-R-00-XX-1700

albifrons) and common tern (*Sterna hirundo*), none of which were observed during the wintering bird surveys undertaken (albeit this would be expected for summer visiting species such as little tern and common tern).

In respect of bats, structures along the promenade (kiosks and shelters) could support features suitable for roosting bats. A number of potential features were observed during the site visit but were not specifically assessed. Further survey work is proposed to inform the EIA. It is anticipated that this survey work would be undertaken in 2021 (subject to guidance from the government on Covid-19 and survey visits).

9.4 Assumptions and limitations

It is possible that certain species may have been overlooked or under-recorded during the assessment for reasons including the following:

- Biological records obtained from third parties and presented in the desk study do not represent a full and complete species list for the area;
- Ecological surveys are limited to factors which affect the presence of plants and animals, such as time of year, migration patterns and behaviour; and
- All information provided was correct at the time of writing this scoping assessment.

9.5 Key guidance and best practice

This Chapter has been prepared with reference to the following legislation and policies of relevance to nature conservation and biodiversity:

- The Environment (Wales) Act 2016)[42];
- Planning Policy Wales (PPW)[43]; and
- Conwy Local Development Plan[44] (adopted 2013).

Ecological assessments were undertaken in compliance with relevant guidance and best practice including:

- Chartered Institute of Ecology and Environmental Management (CIEEM) (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland –2nd edition;
- Joint Nature Conservation Committee (2010). Handbook for Phase 1 Habitat Survey – a technique for environmental audit;
  - Any relevant
  - The British Trust for Ornithology's Wetland Bird Survey, 'look-see' methodology (Bibby *et al*. 2000); and
  - The Marine Habitat Classification for Britain and Ireland (Connor *et al.* 2004).

9.6 Scoping

An initial assessment of the anticipated potential effects from the Scheme on biodiversity is presented below. This assessment has been undertaken on the assumption that best practice working measures and safeguards would be implemented as part of a CEMP. In particular, it is assumed that this CEMP would include pollution control measures (hydrological, noise, dust

[42] The Environment (Wales) Act 2016 [Online] Available at: http://www.legislation.gov.uk/anaw/2016/3/contents/enacted Accessed March 2021

[43] Welsh Government (2021). Planning Policy Wales – Edition 11. [Online] Available at: Planning Policy Wales - Edition 11 (gov.wales) Accessed March 2021

[44] Conwy Local Development Plan 2007 – 2022 [Online] Available at: Conwy Local Development Plan 2007-2022 Accessed March 2021

and lighting), good bio-security practices and sensitive working measures to safeguard protected species such as nesting birds.

9.6.1 Activities scoped into the report

The following activities have been scoped into this report due to their potential to have adverse effects on environmental receptors:

- Promenade construction and improvement works;
- Sea wall defence alterations;
- Beach recharge and associated activities which include:
  - Dredger and tug movements;
  - Pipeline construction (currently proposed to be undertaken on either Colwyn Bay or Pensarn beach); and
  - Pumping of dredged sand to the intertidal area using a combination of floating and sinker pipelines.

9.6.2 Identification of potential effects on biodiversity

Receptors which have the potential to be impacted by the activities identified have been listed in Table 9.2 below.

Table 9.2: Scoping of biodiversity receptors

Receptor/ environmental sensitivities	Potential effects	Scoped in/out
Liverpool Bay/Bae Lerpwl SPA	**Construction** • Disturbance to waterbirds and seabirds (designated interest features of the SPA); and • Water quality effects/increase in suspended sediment on waterbirds and seabirds (designated interest features of the SPA).	In
	Operation • Disturbance to birds and waterfowl during operational beach recharge.	In
Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC	**Construction** • Water quality effects/increase in suspended sediment and disturbance/ displacement of grey seal and fish (designated interest features of the SAC).	In
	Operation • Disturbance/displacement of grey seal and fish during operational beach recharge.	In
Creigiau Rhiwledyn/Little Ormes Head SSSI	**Construction** • Disturbance to birds foraging behaviour (designated interest feature of the SSSI); and • Water quality effects/increase in suspended sediment on foraging birds (designated interest feature of the SSSI).	In
	Operation • Disturbance to birds and waterfowl from operational beach recharge.	In

Receptor/ environmental sensitivities	Potential effects	Scoped in/out
Traeth Pensarn SSSI	**Construction** • Tracking/compaction of sediment from plant vehicles.	In
	Operation • Tracking/compaction of sediment from plant vehicles during pipeline construction for operational beach recharge (if required at this location).	In
Coed Rhôs Fossil Woodland LWS (within) and Royal Fishing Weir LWS (adjacent)	**Construction** • Potential for smothering during beach recharge.	In
	Operation • Potential for smothering during beach recharge.	In
Subtidal sands and gravel and blue mussel beds on mixed substrate	**Construction** *Below assumed dependent on results of biotype survey (presence of blue mussel beds within recharge area):* • Adverse effects on protected blue mussel beds; • Loss of habitat suitable for colonisation by blue mussel and other species due to smothering during beach recharge; • Loss of habitat suitable for colonisation by removal of rocky areas; and • Water quality effects.	In
	Operation *Below assumed dependent on results of biotype survey (presence of blue mussel beds within recharge area):* • There is the potential for loss of blue mussel beds on mixed substrate depending on frequency and location of recharge*.	In
Other priority habitats	**Construction** • Potential loss of habitats due to smothering during beach recharge; • Tracking/compaction of sediment/habitats from plant vehicles during pipeline construction; and • Water quality effects during construction.	In
	Operation • There is the potential for loss of habitat depending on frequency and location of operational recharge.	In
Roosting, foraging and commuting bats	**Construction** • Buildings appear to have low potential for roosting bats and have been scoped in for a preliminary roost assessment. Based on the results of this, further surveys may be required. If no potential roost features are present, then bats will be scoped out. Although the likely value of the Scheme area is considered to be very low potential for foraging or commuting bats this will be considered at the same time as the roost assessments.	In
	Operation • No effects anticipated.	Out
Reptiles	**Construction** • No effects anticipated.	Out
	Operation	Out

Receptor/ environmental sensitivities	Potential effects	Scoped in/out
	No effects anticipated.	
Wintering bird species	**Construction** • Temporary effects to foraging waterbirds and seabirds resulting from blanketing and burial of mixed substrate in the intertidal area during beach recharge, until species recolonise the area; • Water quality effects/increase in suspended sediment reducing visibility for foraging waterbirds and seabirds; and • Disturbance to wintering seabirds (notably common scoter and red-throated diver) from construction and barge movements.	In
	Operation • Maintenance works could disturb wintering waterbirds and seabirds (subject to timing of works).	In
Breeding birds	**Construction** • Temporary effects to foraging breeding waterbirds and seabirds resulting from blanketing and burial of mixed substrate in the intertidal area during beach recharge, until species recolonise the area; • Water quality effects/increase in suspended sediment reducing visibility for foraging; • Loss or modification of nesting terrestrial bird habitat (potential for damage or disturbance to nests) if trees/scrub and kiosks are to be removed; and • Disturbance to breeding waterbirds and seabirds (notably terns) from construction and barge movements.	In
	Operation • Maintenance works, notably landscaping or habitat management, could affect nesting birds (subject to timing of works).	In
Fish	**Construction** • Adverse effects on fish from barge and pipeline movements, resulting in disruption to foraging behaviour and displacement; and • Localised increase in sedimentation or pollution during construction, resulting in disruption to foraging behaviour and displacement.	In
	Operation • Disturbance/displacement of fish during operational beach recharge.	In
Marine mammals	**Construction** • Acoustic disturbance to marine mammals from construction and barge movements; and • Water quality effects/increase in suspended sediment reducing visibility for feeding.	In
	Operation • Any significant repair works/operational recharge works could result in disturbance to marine mammals; and • Disruption to foraging behaviour and displacement.	In
	Construction	In

Receptor/ environmental sensitivities	Potential effects	Scoped in/out
Marine invertebrates	• Adverse effects on marine invertebrates due to water quality effects; • Smothering of species during beach recharge; and • Adverse effects on marine invertebrates and submerged seaweed from construction activities, beach recharge and water quality effects.	
	Operation • Potential for vehicles to track over habitats to undertake maintenance/repair works; and • Smothering of species during operational beach recharge.	In
General	• Construction pollution (hydrological, dust and plastics) to adjacent habitats.	In

Source: Mott MacDonald Ltd, 2021

*Subject to the results of the intertidal survey and feedback from marine specialists (notably their assessment of the importance of the mussel beds and any invertebrate communities present).

9.6.2.1 Potential beneficial biodiversity effects (subject to enhancements)

Potential beneficial effects of the Scheme are as follows:

- There is potential for beneficial effects on habitats through appropriate design, both for intertidal and terrestrial habitats; and
- Potential creation of additional rocky shore habitat for colonisation through improvements to the groyne at Rhôs-on-Sea harbour and potentially in any identified enhancement areas.

9.6.3 Environmental sensitivities

Based on the potential adverse effects of the Scheme during construction, the following environmental receptors have been scoped in:

- Liverpool Bay/Bae Lerpwl SPA;
- Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC;
- Creigiau Rhiwledyn/Little Ormes Head SSSI;
- Traeth Pensarn SSSI;
- Coed Rhôs Fossil Woodland LWS;
- Royal Fishing Weir LWS;
- Benthic habitats (blue mussel beds and subtidal sands and gravel*);*
- Roosting, foraging and commuting bats;
- Wintering waterbirds and seabirds;
- Breeding birds;
- Marine invertebrates;
- Fish; and
- Marine mammals.

During operation, the following have been scoped in:

- Liverpool Bay/Bae Lerpwl SPA;
- Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC;

- Creigiau Rhiwledyn/Little Ormes Head SSSI;
- Traeth Pensarn SSSI;
- Coed Rhôs Fossil Woodland LWS;
- Royal Fishing Weir LWS;
- Benthic habitats (blue mussel beds and subtidal sands and gravel*);*
- Other priority habitats;
- Wintering birds;
- Breeding birds;
- Fish;
- Marine Mammals; and
- Marine invertebrates

All other receptors have been scoped out and are not considered further. For potentially significant effects, mitigation and enhancement would be included within the ES Chapter and HRA.

9.7 Additional information and assessments/reporting required in support of the ES

The potential for significant effects has been identified and consequently biodiversity has been scoped into the environmental statement for both construction and operation.

The following ecological surveys/reporting would be required to inform the assessment and mitigation in the biodiversity ES Chapter:

- Intertidal Survey, scheduled to be undertaken late March 2021;
- Bat preliminary roost assessment and assessment of habitat quality for foraging and commuting bats; and
- Supplementary bird surveys scheduled February-April 2021 (to supplement 2019-2020 data).

In addition to the biodiversity ES chapter and based on the ecological baseline, it is anticipated that the following reports would be produced:

- Updated Over-wintering Bird Report;
- Report to inform a HRA;
- Biosecurity Risk Assessment; and
- CEMP.

A Phase 1 Habitat Survey was completed for the entire Colwyn Bay area and a Preliminary Ecological Appraisal Report produced in July 2020.

9.8 Proposed methodology

The proposed EIA methodology for the assessment of biodiversity effects can be found in Appendix C.3.

10 Climate

10.1 Introduction

This Chapter sets out the proposed scope for the assessment of the potential effects of the Scheme on climate. Two aspects are considered for the climate assessment, these are the impact of the Scheme upon climate change and the resilience of the Scheme to climate change.

'Impacts of the Scheme upon climate change' considers greenhouse gas (GHG)[45] emissions arising from the Scheme, as these contribute to climate change, covered under effects on climate. During the construction phase, embodied carbon emissions from the use of construction materials are considered to be the main contributor to climate change, with additional greenhouse gas emissions arising from the use of plant and transport of materials.

'The resilience of the Scheme to climate change' is also considered as part of this Chapter. The Scheme design would take into account climate change including predicted sea level increases when considering the design of the coastal defences.

In addition, a CEEQUAL assessment (sustainability assessment and rating scheme for civil engineering, infrastructure, landscaping, and public realm projects) is proposed to be completed for the Scheme which includes the requirement for a Carbon Management Plan.

10.2 Study Area

The assessment of the effects on climate does not have a physical study area *per se* as the receptor (climate change) for GHG emissions is not spatially defined. Instead, the construction assessment would consider the embodied carbon within the materials, construction plant emissions, and emissions from transport of materials to site. The operation assessment would consider the emissions from repair and maintenance (where possible), and energy use through operation.

The resilience of the Scheme to climate change would be considered within a Climate Change Risk Assessment (CCRA) with a study area which would include all areas of land take and would consider all elements of the Scheme design.

The CCRA would consider the 2070s (2060-2079) as the timeline for analysis. This choice is informed by the long lifespan of the key structures within the Scheme. The UK Climate Projections[46] would be used to set the future baseline, and the furthest projections available are for the 2080s time period. Where structures have a shorter lifespan (e.g. street lighting) this would be taken into account in the assessment.

[45] A greenhouse gas is a gas that absorbs and emits radiant energy within the thermal infrared range. Greenhouse gases cause the greenhouse effect. The primary greenhouse gases in Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide and ozone.

[46] Met Office (2019) [Online] Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/high-res-projections Accessed March 2021.

10.3 Baseline conditions

10.3.1 Existing baseline

10.3.1.1 Effects on climate

The construction industry is the largest consumer of natural resources in the UK and this accounts for approximately 10% of the total UK carbon emissions[47]. Therefore, assuming the UK proportion in lieu of a Wales specific proportion, it has been estimated that approximately 3.9MtCO_2e are attributed to the embodied carbon of construction materials in Wales as a whole based on 2018 emissions[48]. The Scheme falls within Conwy authority which reported 586ktCO_2 regional emissions for 2018[49].

10.3.1.2 Resilience of the Scheme to climate change

The Met Office holds historical regional climate information, in which Colwyn Bay is included in the Wales region[50]. High-level climate observations for the Wales region over a 30-year averaging period between 1981-2010 are available (see Table 10.1). The climate variables used to describe current and future climate are temperature, precipitation and wind. These climate variables can also lead to changes in extreme climate events (for example, floods, droughts, soil moisture deficit, heatwaves, snow and ice). The information obtained on changes in the climate variables would be used to provide insight into future changes in extreme climate events.

Table 10.1: Climate baseline observations

Weather variables	Climate observations
Temperature	Mean daily minimum temperatures in Wales can range from 0°C to 3°C in winter, with January being the coldest month, and in summer daily maximum temperatures are in the region of 18°C, with the hottest days being observed in July.
Heatwaves	Extreme maximum temperatures can occur in July or August. A temperature of 35.2°C was recorded in Hawarden Bridge, Flintshire on 2nd August 1990. When a hot airstream arrives from the east, maxima along the coasts can equal those inland, an example being the 31.8°C achieved at Aberporth, Ceredigion on 2nd August 1995.
Rainfall	Throughout Wales, the months from October to January are significantly wetter than those between February and September. This seasonal pattern is a reflection of the high frequency of winter Atlantic depressions and the relatively low frequency of summer thunderstorms. The number of days with a rainfall total of 1mm or more ('wet days') tends to follow a pattern similar to the monthly rainfall totals. In the higher parts, over 50 days is the norm in winter (December-February) and over 35 days in summer (June-August).
Wind	Wales is one of the windier parts of the UK, with the windiest areas being over the highest ground and along the coasts, particularly those facing directions between north-west and south. Coastal areas average 15 days or more of gale each year with the number of days decreasing inland to 5 days or fewer. Wind gusts are the highest in November – February with the ability to reach 80 knots.

[47] Institute of Civil Engineers (ICE) (2014): Energy Briefing Sheet: Embodied Energy and Carbon [Online] Available at: https://www.ice.org.uk/ICEDevelopmentWebPortal/media/Documents/Disciplines%20and%20Resources/Briefing%20Sheet/Embodied_Energy_and_Carbon.pdf Accessed March 2021.

[48] National Atmospheric Emissions Inventory (2020). Devolved Administration GHG Inventory 1990-2018.

[49] Department for Business, Energy and Industrial Strategy (2020): 2005 to 2018 UK local and regional CO_2 emissions – data tables [online] available at: **Error! Hyperlink reference not valid.**https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/720677/2005-16_UK_local_and_regional_CO2_emissions.xlsx Accessed March 2021

[50] The Met Office (2016) Wales: Climate [Online] Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/regional-climates/wales_-climate---met-office.pdf Accessed March 2021.

Source: Met Office[50]

10.3.2 Future baseline

10.3.2.1 Effects on climate

The Welsh government have committed to reach net zero carbon by 2050 with an aim to reach net zero GHG at an earlier date following updated advice from the Climate Change Committee[51]. In a wider context, the UK government has also committed to net zero GHG emissions by 2050, amending the Climate Change Act 2008[52].

The UK 2019 energy demand and greenhouse gas emissions projections[53] show that the third carbon budget (2018 to 2022) is very likely to be achieved with a headroom of around 26MtCO_2e. However, the Committee on Climate Change have stated that emissions would need to fall quicker than the existing fourth carbon budget (2023 to 2027) and fifth carbon budget (2028 to 2032)[54]. The Committee on Climate Change have also recommended an ambitious 6th Carbon Budget to allow the UK to meet net-zero carbon by 2050. Significant effort is required to ensure that all contributing emissions are reduced as far as possible through the design, construction and operation of the Scheme.

10.3.2.2 Resilience of the Scheme to climate change

The UK Climate Projections (UKCP) developed by the Met Office Hadley Centre include regional climate projection data, for which Conwy is included in the Wales region. Wales is projected (under a range of emissions scenarios modelled in UKCP18) to experience hotter and drier summers, and warmer and wetter winters (See Table 10.2). Key to the design of this Scheme is the projected sea level rise.

For the CCRA, climate projections data for the 2070s (2060-2079) under RCP 8.5[55] (the highest scenario available in UKCP18) have been selected. Projected changes in key climate variables and sea level under the RCP 8.5 emissions scenario, are summarised in Table 10.2.

Table 10.2: Future climate projections over land for the 2070s (RCP 8.5 scenario)

Climatic conditions	Climate projections
Temperature	The average summer temperature is projected to increase by 3.2°C under the central estimate, which represents “as likely as not” probability of change (50th percentile), and average winter temperature is estimated to increase by 2.4°C (50th percentile).
Rainfall	The average summer rainfall rate is estimated to decrease by 29%, whereas the average winter rainfall rate is estimated to increase by 16% (in the 50th percentile for both)
Sea Level Rise	Mean sea levels are expected to increase by 0.31m-0.64m by 2070 (in the 5th and 95th percentile respectively) for the most relevant location included in the

[51] Climate Change Committee (2020). *December 2020 Progress Report: Reducing Emissions in Wales* [online] available at: Progress-Report-Reducing-emissions-in-Wales.pdf (theccc.org.uk) Accessed March 2021

[52] Gov.uk (2019) Climate Change Act 2008 [Online] Available at: https://www.legislation.gov.uk/ukpga/2008/27/section/1 Accessed March 2021

[53] Department for Business, Energy & Industrial Strategy (BEIS), Updated energy and emissions projections 2019 (October 2020) [Online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/931323/updated-energy-and-emissions-projections-2019.pdf Accessed March 2021

[54] Climate Change Committee (2020). *The Sixth Carbon Budget – The UKs path to Net-Zero.* [online] available at: https://www.theccc.org.uk/publication/sixth-carbon-budget/ Accessed March 2021

[55] RCP: Representative Concentration Pathways. RCPs are the new scenarios developed by the Intergovernmental Panel on Climate Change (IPCC) and used by the UKCP18 climate projections. RCPs are based on the projected concentration of greenhouse gases in the atmosphere in 2100, e.g. RCP 8.5 is a radiative forcing of 8.5 in 2100. These replace the previous Low, Medium and High scenarios. There are 4 RCPs in UKCP18 (2.6, 4.5, 6.0 and 8.5). These do not directly map onto the Low, Medium, High scenarios used previously.

	UKCP18 which is Cardiff. The future impact of sea level rise would be included as part of the Flood Risk Assessment (FRA) carried out for the Scheme.
Wind	Climate projections for wind are more uncertain than those for temperature and precipitation, due to inherent difficulty in modelling future wind conditions. However, overall an increase in extreme weather, including wind, is projected.

Source: UKCP18 Climate Projections[56]

10.4 Assumptions and limitations

- Emissions associated with the end of the life stage (lifecycle stages C1-4), decommissioning, would not be considered given the uncertainty of the length of operation of the Scheme;
- There would be assumptions made in estimating the GHG emissions from the construction and operation of the Scheme. Assumptions may include material quantities or type, or assumptions in determining the most appropriate emission factor. Specific assumptions would be included within the ES;
- Where possible maintenance and replacement over the lifetime of the Scheme would be included. However, this would depend on the level of information available. Any assumptions or exclusions would be detailed within the ES;
- Where Scheme specific data for the transport of material to site is not available assumptions provided by the Royal Institute of Chartered Surveyors[57] would be used;
- Information on the climate baseline and future projections are based on freely available information from third parties, including the historical meteorological variables recorded by the Met Office and the UK Climate Projections (UKCP18) developed by the Met Office. In addition, the assessment has been informed by a selected range of existing climate change research and literature, available at the time of writing this assessment; and
- Generally global projections are more certain than regional, and temperature projections more certain than those for precipitation. Further, the degree of uncertainty associated with all climate change projections increases for projections further into the future.

10.5 Key guidance and best practice

Key legislation, policy and guidance relevant for climate includes:

- Climate Change Act, 2008 (2019 amendment sets a Net Zero target by 2050 compared to 1990 baseline);
- The Environment (Wales) Act, 2016 (requires net 2050 emissions are at least 80% lower than baseline set in legislation);
- Prosperity for All: A Low Carbon Wales (2019);
- The Carbon Plan, 2011 (the plan sets out how the UK would achieve decarbonisation within the framework of the energy policy);
- EIA Guide to Climate Change Resilience and Adaptation (2020)[58]; sets out guidance on undertaking the vulnerability of the Scheme to climate change assessment;
- EIA Guide to Assessing Greenhouse Gas emissions and Evaluating their Significance (2017)[59]; sets out a guide to undertaking the effects on climate assessment
- Infrastructure Carbon Review, 2013 (sets out carbon reduction actions required by infrastructure organisations); and

[56] Met Office (2018) UKCP18 Climate Projections: Key results [Online] Available at: https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Key-results.xlsx Accessed March 2021

[57] Royal Institute of Chartered Surveyors (2017) Whole life carbon assessment for the built environment.

[58] Institute of Environmental Management and Assessment (2020) EIA Guide to Climate Change Resilience and Adaptation

[59] Institute of Environmental Management and Assessment (2017) EIA Guide to Assessing Greenhouse Gas emissions and Evaluating their Significance

- Publicly Available Specification 2080:2016 (sets out a common approach and understanding of whole life carbon management in the provision of economic infrastructure as a result of the Infrastructure Carbon Review).

10.6 Potential effects

The potential effects of the Scheme are anticipated to be as detailed in Table 10.3. A confirmatory scoping opinion is requested from all relevant statutory consultees.

Table 10.3: Potential effects

Effects	Construction	Operation
Effects on Climate		
Potential Non-Significant Effects	All emissions are considered potentially significant.	
Potential Significant Effects	Embodied carbon emissions from the use of construction materials, staff commuting to site, diversion routes plant emissions and emissions from transport of materials to site.	Emissions through operational energy, maintenance, and repair including operational beach recharge.
Scoped In/Out	**Scoped In**	**Scoped In**
Resilience of the Scheme to Climate		
Potential Non-Significant Effects	Delays to construction programme and damage to construction materials if an extreme weather event occurs during the short construction period.	Melting or deformation to pavement surfacing due to increased temperatures. Increased precipitation could result in overland flow and flooding of the promenade. In-combination effects with other environmental disciplines e.g. landscape. Promenade flooding due to large waves overtopping the revetment. Climate change considered within the design.
Potential Significant Effects	Unlikely to be any significant effects during the short construction period.	N/A Climate change considered within the design.
Scoped In/Out	**Scoped Out**	**Scoped Out**

Source: Mott MacDonald Ltd, 2021

The assessment for the Scheme's effect on climate change would consider the GHG emissions potential throughout the lifecycle of the Scheme for both construction and operation.

For the resilience of the Scheme to climate change, construction has been scoped out due to the short-term construction period in relation to climate change. The Scheme design would take climate change into account, including predicted sea level increases when considering the design of the coastal defences and promenade height. Therefore, the potential significant effects have already been assessed and mitigation incorporated into the design and as such, operational effects have been scoped out of the assessment.

It is important that the design seeks to limit GHG emissions from the earliest stage possible to ensure the greatest reductions can occur. In line with the Welsh Government's carbon reduction plan, the Scheme design would seek to reduce GHG emissions as far as practicable in all cases to contribute to the UK and Wales' net reduction in carbon emissions and maximise the

potential for reducing GHG emissions. The following high-level approach would be applied and developed when seeking to reduce GHG emissions (as stipulated within PAS 2080):

- Build nothing: The design would evaluate the basic need for an asset and/or programme of works and shall explore alternative approaches to achieve outcomes set by the asset owner/manager;
- Build less: The design would evaluate the potential for re-using and/or refurbishing existing assets to reduce the extent of new construction required;
- Build clever: The design would consider the use of low carbon solutions (including technologies, materials and products) to minimise resource consumption during the construction, operation and use stages of the asset or programme of work; or
- Build efficiently: The design would use techniques (e.g. construction, operational) that reduce resource consumption during the construction and operation phases of an asset or programme of work.

10.7 Additional information and assessments/reporting required in support of the ES

Potentially significant effects have been identified as being possible and consequently climate change has been scoped into the environmental statement. In order to complete the ES the following supplementary/supporting information is required for this discipline:

- CEMP;
- A Site Waste Management Plan (SWMP); and
- A Carbon Management Plan is recommended to ensure the greatest reduction in carbon emissions and smallest effect on climate change is achieved – this would form part of the CEEQUAL assessment.

10.8 Proposed methodology

An outline of the proposed EIA methodology for the assessment of effects on climate can be found in Appendix C.4.

11 Coastal Processes (Including Flood Risk, Water Quality and Navigation Aspects)

11.1 Introduction

This Chapter sets out the proposed scope for the assessment of the potential effects of the Scheme on coastal processes, coastal flood risk, designated waterbodies and navigation.

The evolution and development of a shoreline is linked to the interaction between the natural processes applying both offshore and, more significantly, inshore and the geological / geomorphological form and profile of natural shoreline features and the form/profile of artificial coastal defence structures.

Once operational, the Scheme would provide additional protection for the western area of the Colwyn Bay frontage where the defences are at risk of failure in the future and there is flood risk from overtopping. The Scheme would be designed to operate in conjunction with existing coastal processes.

For the purposes of this report the scoping of coastal and sediment processes includes:

- Direct effects on hydrodynamics and sediment dynamics;
- Indirect effects of these on other environmental aspects;
- Effects upon coastal water quality; and
- Navigation effects.

Planning permission would be sought from CCBC and a Marine Licence application would be made to NRW with consultation completed where necessary.

11.1.1 Reference reports

The following relevant assessments/reporting have been undertaken to date:

- Detailed Modelling Studies for Colwyn Bay Coastal Defence Scheme: Physical Model Tests of Linear Defences (2010) (Appendix E) [60];
- Colwyn Bay Detailed Modelling Study for Coast Defence Scheme, Phase 1 Interim Modelling Technical Note (2010) (Appendix E)[61];
- Colwyn Bay Physical Model, Coastal Defence Schemes Modelling Report (2017)[62] (included within Appendix E);
- Colwyn Bay Project Appraisal Review and Update (May 2018)[63] (included within Appendix D); and
- Colwyn Bay Old Promenade Wav Overtopping Assessment (2020)[64].

[60] Royal Haskoning, 'Detailed Modelling Studies for Colwyn Bay Coastal Defence Scheme: Physical Model Tests of Linear Defences' (2010)

[61] Royal Haskoning, 'Colwyn Bay Detailed Modelling Study for Coast Defence Scheme: Phase 1 Interim Modelling Technical Note' (2010)

[62] HR Wallingford, 'Colwyn Bay Physical Model, Coastal Defence Schemes Modelling Report' (2017)

[63] CCBC, "Project Appraisal Review and Update" (2018)

[64] Mott MacDonald, "Colwyn Bay Old Promenade Wave Overtopping Assessment' (2020)

11.2 Study Area

The study area for the coastal processes assessment is based on the area which the Scheme could be reasonably expected to have an effect on. For this scheme the RLB is anticipated to include the following areas:

- The shoreline between Rhôs Point to the west and Tan Penmaen Head to the east above mean low water for coastal processes. This is owing to the coastal processes within this area being constrained by the Rhôs-on-Sea Breakwater and the Tan Penmaen headland;
- The hinterland behind the scheme for the assessment of the flood risk;
- The area between the shoreline to approximately 2.0km off-shore for the construction impacts for the recharge vessels and pipelines and navigation aspects; and
- The marine waters of Colwyn Bay for the water quality assessment.

A plan of the RLB is provided in Appendix B.

11.3 Baseline conditions

Previous work has been carried out on behalf of CCBC to ascertain baseline conditions for the frontage. This has included the development of a coastal strategy and project appraisal report (draft)[63] and the completion of ESs and non-statutory Environmental Reports (ER) for previous phases of the Colwyn Bay Waterfront Project.

During Phases 1a/b/c and 2a of the Colwyn Bay Waterfront Project, baseline conditions have been used to develop both numerical and physical models for the area in order to gain a thorough understanding of the hydrodynamics[60,61,62], and the potential effect of any reconfiguration of beach control and coastal protection structures. Information from these studies is being used to inform the detailed design.

11.3.1 Hydrodynamics

11.3.1.1 Tides and tidal currents

The tidal range along this section of the frontage has an important influence on coastal processes. The spring tidal range is up to 7.1m with a neap tidal range of 3.8m.

Tidal currents in Liverpool Bay are generally in an easterly direction on the flood tide and westerly on the ebb tide with a residual net current from west to east. At Colwyn Bay, the tidal streams are generally in a west to east direction which dictates sediment transport. The tidal currents, together with the agitation of wave action are sufficiently high enough to induce shear stresses which exceed the critical shear stress for initiating the movement of sand on the seabed[65].

11.3.1.2 Wave climate

The wave conditions at Colwyn Bay are generally generated by local wind or as a result of longer period swell waves that have propagated into the Irish Sea from the Atlantic Ocean via the St Georges Channel and Cardigan Bay to the south, or the channel between Scotland and Northern Ireland to the north. These waves come from a west- north-west direction and get refracted towards the beach parallel to the shoreline.

Modelling studies of the wave climate at Colwyn Bay waterfront completed by Royal Haskoning in 2010[60] showed waves were propagated from an offshore location to the project area and effects of beach fluctuations on the waves were included. The modelling identified that on a

[65] CEUK (2006) – CEUK Colwyn Bay Coastal Defence Strategy Plan, Natural Processes and Coastal Defence Baseline Report (2006)

HAT tide, waves approaching the shoreline could be up to 3.0m in height for the 1 in 50-year event and approximately 2m in height for the 1 in 1-year event.

11.3.2 Geology and geomorphology

11.3.3 Underlying geology

According to British Geological Survey (BGS) mapping[66], bedrock geology across the Scheme comprises the Elwy Formation – Silurian mudstone, siltstone and sandstone. Immediately to the west at Rhôs-on-Sea is the Clwyd Limestone Group.

Superficial deposits comprise a combination of Devensian Till (diamicton) and Devensian Glaciofluvial Deposits along the Promenade and NWC Railway Line embankment, with Marine Beach Deposits present in the intertidal area.

A ground investigation is being undertaken for the Phase 2B frontage and would be available during the detailed design and ES production for the Scheme.

11.3.4 Sediment processes

The net littoral drift along the frontage is in a west to east direction with sediment transport around Rhôs Point limited to fine sand and silt-sized material offshore. Inshore, the beaches in Penrhyn Bay (to the immediate west of Rhôs-on-Sea) have largely been denuded of fine material and the protrusion of Rhôs Point limits the transport of material around the headland.

The majority of alongshore sediment transport within Colwyn Bay is thought to take place on the lower foreshore. Observations and monitoring suggest material between low and high water is moved on/offshore by wave activity and interaction with the defences.

11.3.5 Hydrological setting

11.3.5.1 Catchment description

The hydrological catchment surrounding the Phase 2B area is primarily urban, namely the town of Colwyn Bay. The upper reaches of the catchment are predominantly agricultural, in particular grazing land and forestry, with isolated dwellings.

11.3.5.2 Surface waterbodies (WFD)

The adjacent marine waters are part of the North Wales Coastal Waterbody (Western Wales River Basin District) Water Framework Directive (WFD) Waterbody ID GB641011650000[67]. Its current overall status is Moderate (ecological: Moderate and chemical: Fail).

11.3.5.3 Surface water courses (WFD)

No rivers/streams discharge to the upper beach within the Phase 2B area, however there are a number of outfalls present including a small un-named stream that passes next to Rydal Boat Store before discharging via a pipeline and outfall.

The closest WFD watercourse Main River discharges approximately 2.0km to the west in Penrhyn Bay:

- The Ganol East (Main River) WFD Waterbody ID: GB110066059902[67], current overall status of ‘Moderate (ecological: Moderate and chemical: Good).

[66] BGS Website: https://mapapps.bgs.ac.uk/geologyofbritain/home.html, Accessed March 2021
[67] Water Watch Wales website: https://waterwatchwales.naturalresourceswales.gov.uk/en/, Accessed March 2021

To the east of Porth Eirias within the Phase 3 (Old Colwyn) area there are three fluvial watercourses in the vicinity of the Scheme (none are WFD watercourses):

- The Nant-y-Groes (Main River) is present to the immediate east of the Phase 1 area (the eastern extent of the Scheme RLB) beyond the Porth Eirias Groyne, discharging to the beach via a culvert that passes beneath Porth Eirias at approximate NGR 285760, 378946;
- The Llwd (Main River) is culverted and is understood to discharge to the beach at approximate NGR 285877, 378888 approximately 200m to the east of Porth Eirias. The culvert flows beneath a sports centre and recreational ground before discharging to the beach; and
- The Nant-y-Fynnon (Ordinary Watercourse) passes through Old Colwyn, flowing in an artificial channel down Beach Road and beneath the A55 Expressway before being culverted beneath the NWC Railway Line and outfalling directly onto the beach at Splashpoint at approximate NGR 287008, 378709, approximately 1.3km to the east of Porth Eirias.

11.3.5.4 Groundwater bodies (WFD)

The Clwyd Permo-Triassic Sandstone Groundwater Waterbody is located beneath the Scheme WFD Waterbody ID GB41001G202100. Its current overall status is Good (quantitative: Good and chemical: Poor).

11.3.6 Protected areas

11.3.6.1 Natura 2000 sites

The North Wales Coastal Waterbody is linked to the Liverpool Bay/Bae Lerpwl SPA (approximately 250m from the sea wall), immediately adjacent to the area of beach recharge (with construction boat and pipeline movements to be undertaken within its boundary).

In addition, Y Fenai a Bae Conwy/Menai Strait and Conwy Bay Special Area of Conservation (SAC) is located approximately 2.5km west of Rhôs Point.

11.3.6.2 Bathing water quality

There are two bathing water quality monitoring points located within the Scheme RLB, one on the beach at Rhôs-on-Sea (284634,380141) with an additional point to the west of Porth Eirias (approximate NGR 285566, 379291).

In 2020 the results of sampling and analysis of water quality at both sampling points against the revised Bathing Water Regulations 2013 by NRW resulted in an Excellent classification[70]. Water quality at designated bathing water sites in Wales is assessed by NRW from May to September including testing the numbers of intestinal enterococci and Escherichia coli present.

Streams are typically affected by sewage or industrial run off from further up the catchment. The Nant-y-Ffynnon and Nant-y-Groes both drain directly onto the bathing beach to the east of Porth Eirias. Reduced water quality may persist in the rivers for some time after rainfall has occurred. There is also the potential for reduced water quality in the adjacent area where the rivers enter the sea.

According to NRW "*there are no sewage treatment works that discharge directly into Colwyn Bay bathing waters. A major improvement scheme was completed by Dŵr Cymru Welsh Water for Conwy, Deganwy, Llandudno and Colwyn Bay in 1999. The sewage from the immediate catchment of the Llandudno, Conwy, Deganwy and Colwyn Bay areas is now pumped to the Ganol Wastewater Treatment Works, at Llandudno Junction*"[70].

Within the catchment there are a number of storm and surface water outfalls, that discharge to the rivers and streams. After periods of rainfall these discharges could have an adverse effect on bathing water quality.

11.3.6.3 Shellfish waters

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 requires specification of protected areas for those areas designated for the protection of economically significant species. The closest shellfish water is located immediately to the north-west of the Scheme around the mussel beds at Rhôs Point[68], although there is understood to be no harvesting activity in this zone at present. Some limited boat movements associated with the beach recharge may take place within the boundary for this Shellfish Water.

11.3.6.4 Nitrate Vulnerable Zones

There are no Nitrate Vulnerable Zones (NVZ) which may be impacted by the Scheme with the closest being located in Denbighshire[69].

11.3.7 Other Considerations

11.3.7.1 Phytoplankton

Phytoplankton (microscopic algae) naturally increase in number at certain times of the year. This process is known as a phytoplankton bloom. Algal blooms can occur at any beach during the bathing season and are usually noticeable by a surface scum.

According to NRW, blooms of the algae Phaeocystis do occur along this coastline during warm and calm weather in May and June. This typically produces a cream or brown coloured scum along the water's edge but is otherwise harmless[70].

11.3.7.2 Drainage

In general, current surface water runoff from the promenade and highway area drains directly to the foreshore and into the sea.

11.3.8 Coastal flood risk

Tidal water levels are recorded to the west of the proposed site, with a typical tidal range of approximately 5m. The spring tidal range is up to 7.1m and a neap tidal range of 3.8m. The highest astronomical tide level recorded is 4.68m AOD.

The wave conditions at Colwyn Bay are generally generated by local wind or as a result of longer period swell waves that have propagated into the Irish Sea from the Atlantic Ocean via the St Georges Channel and Cardigan Bay to the south, or the channel between Scotland and Northern Ireland to the north.

The area of interest lies within or close to 'TAN15: Development Advice Maps' Zone C2; this is described as an area "without significant flood defence infrastructure" (shown in Figure 11.1). This zone is based on NRW's extreme flood outline, which is greater than or equal to a 0.1% Annual Exceedance Probability (AEP) event. However, there are known overtopping risks on the promenade occurring during spring tides. There is no formal record of road closures of the promenade highway. However, it has been noticed that the number of closures has increased in

[68] NRW Shallfish Water Data: Shellfish Water Protected Areas 2016 (cyfoethnaturiol.cymru), Accessed March 2021

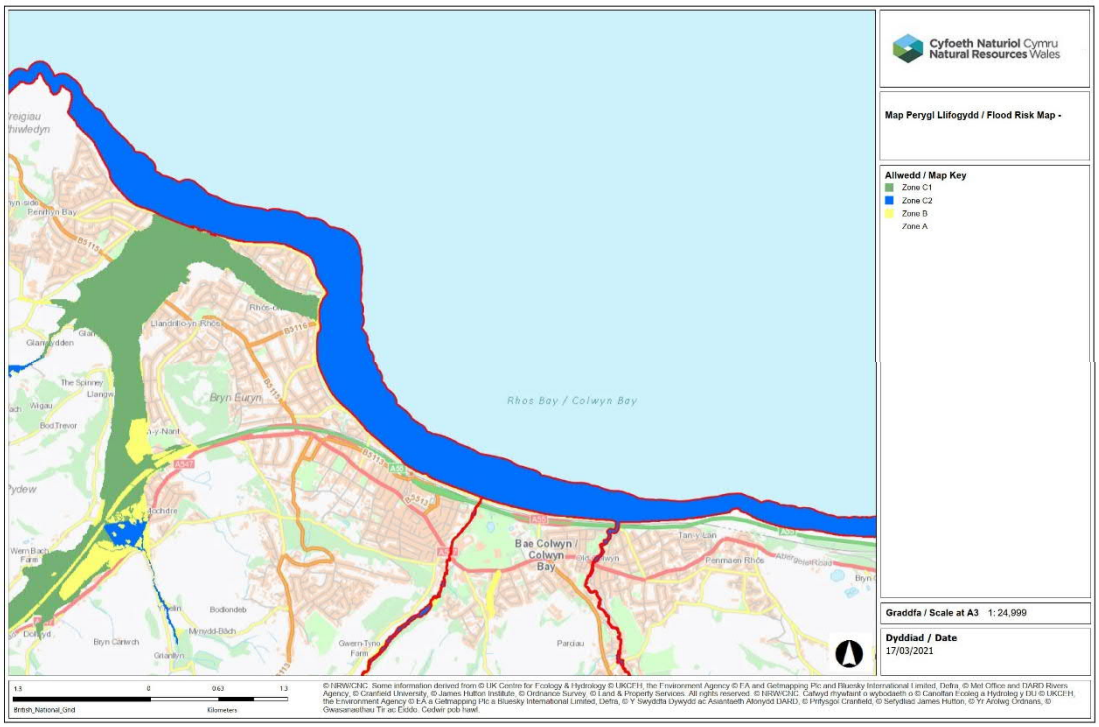
[69] Natural Resources Wales (undated) [Online] Available at: www.lle.gov.wales/ Accessed March 2021

[70] NRW Bathing Water data: https://environment.data.gov.uk/wales/bathing-waters/profiles/profile.html?site=ukl1301-40425, Accessed March 2021

recent years. It is understood from CCBC that sections of the promenade are routinely closed whenever spring tides coincide with forecast north or north-west winds.

In the past, overtopping has caused the surfacing of the promenade to become severely damaged, the handrails failed, sections of the seawalls have suffered from risk of undermining / voids to the rear of the promenade. These are repaired by the Client on a reactionary basis.

Figure 11.1: Development Advice map for Colwyn Bay



Source: Welsh Government Development Advice Maps, 2021

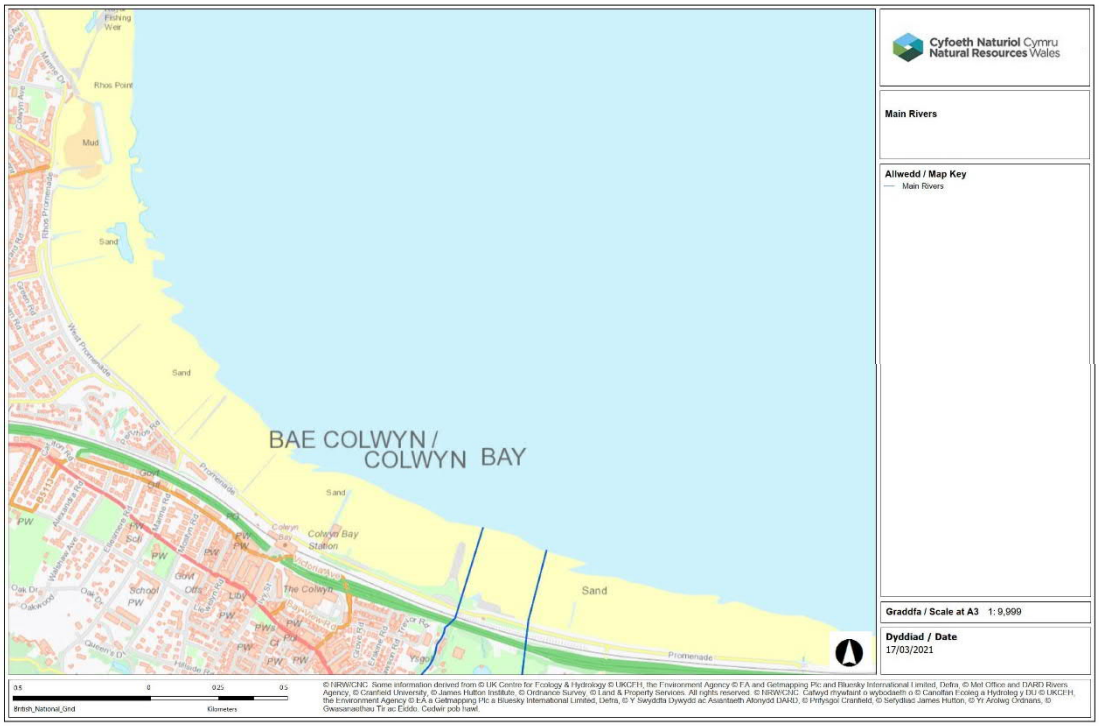
11.3.9 Fluvial flood risk

The closest fluvial watercourses are discussed in 11.3.5.3 and include:

- Immediate east of Porth Eirias: The Nant-y-Groes (Main River);
- Approximately 200m east of Porth Eirias: The Llwd (Main River);
- Approximately 1.4km east of Porth Eirias: The Nant-y-Fynnon (Ordinary Watercourse); and
- Approximately 2.0km west: The Ganol East (Main River).

None of these fluvial watercourses would pose a flood risk to the Scheme or construction (shown in Figure 11.2). This scheme focuses on the impact of overtopping on the frontage. The scheme is not considered to have an impact on the fluvial flood risk, as where rivers currently outfall onto the beach this would be maintained (outside of the Phase 2b area).

Figure 11.2: Main Rivers at Colwyn Bay



Source: Natural Resources Wales, 2021

11.3.10 Surface water flood risk

NRW's 'Risk of Flooding from Surface Water' online maps shows that there is some surface water flood risk in the area of interest (shown in Figure 11.3 below). In general, surface water runoff from the Promenade and highway area flows into surface water drains or outfalls and directly to the foreshore and into the sea.

Figure 11.3: Colwyn Bay Surface Water Flood Risk

Source: Natural Resources Wales, 2021

11.3.11 Navigation

Within the Colwyn Bay frontage there are sailing and jet ski clubs that operate all year round (outside of Covid-19 restrictions). In addition, the local school has their boat club house along the frontage and sail between April and October. Within the sea behind the Rhôs-on-Sea breakwater and on the beach a number of boats are moored.

11.4 Assumptions and limitations

The impacts of coastal processes along this frontage have been reviewed using modelling from the previous schemes.

A CEMP would be prepared by the appointed Contractor and implemented during the construction period. The CEMP would ensure that reasonable and practical steps are implemented to prevent the pollution of the coastal environment and protect local water quality.

It is also assumed that the Contractor would develop and implement a robust Construction Flood Management Plan during the construction phase.

11.5 Key guidance and best practice

The following have specific relevance to the coastal processes impact of the Scheme:

- TAN14 (Coastal Planning): This policy provides guidance on protection of the coastal zone from inappropriate development. Consideration is given to visual amenity, physical processes and ground conditions; sensitivity and conservation of designated marine and coastal sites; the requirement for remedial works and defence works; and recreational resource development;
- TAN15 (Development and Flood Risk), this TAN aims to prevent new development in areas of high flood risk and provides guidance on policy objectives for the management and

reduction of flood risks. Note: TAN 14 and TAN 15 are being amalgamated and revised into a new TAN15v2 due for publication this summer. Any updates issued during the EIA process will be taken into account;

- The Welsh National Marine Plan (November 2019);
- National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in Wales (October 2020);
- The Conwy Local Development Plan Replacement 2018 - 2033, Topic paper includes a policy for the Coastal Zone (NTE/5) which highlights the developments that are permitted in the coastal area, and the policy for the natural environment (NTE/1) which identifies the need to protect the coastal zone and improve biodiversity and water pollution;
- The North West England and North Wales Shoreline Management Plan (SMP22, sub-cell 11a) August 2016, within which the policy for the frontage is to Hold the Line: "*This policy includes those situations where work is carried out in front of the existing defences (such as beach recharge, rebuilding the toe of a structure, building offshore breakwaters and so on) to improve or maintain the standard of protection provided by the existing defence line. It also includes work behind existing defences (such as building secondary flood defences) where this work would form an essential part of maintaining the current coastal defence system*"[71];
- There is guidance in the EurOtop Manual[72,73] on wave overtopping criteria for the safety of people and vehicles;
- Water Framework Directive (England and Wales) Regulations 2017; and
- The Wildlife and Countryside Act 1981 (as amended).

11.6 Potential effects

The potential effects the Scheme could have on both the direct impacts to hydrodynamics, sediment dynamics, coastal water quality and navigation, and indirect impacts of these on other environmental aspects are presented in Table 11.1. A confirmatory scoping opinion is requested from all relevant statutory consultees.

Table 11.1: Potential Effects

Effects	Construction	Operation
Coastal Processes (Coastal Hydromorphology)		
Potential Insignificant Effects	Temporary changes to water body hydromorphology – scour of stockpiles and toe of structures, potential material movement away from the Scheme. The placement of the sinker line from the recharge vessel could have a short-term impact on the coastal processes along the frontage. The construction of the pipeline on the beach could result in short term impacts on coastal processes (Pensarn/Colwyn Bay). It is assumed that the pipes would be stored parallel to the shoreline – this would reduce asociated impacts.	Potential for changes to water body hydromorphology – water body already heavily modified for the same purpose as the Scheme. In the longer term, there could be changes in the longshore sediment movement along the frontage as a result of the proposed rock structures. This would be assessed during the detailed design process.

[71] Halcrow (2011) North West England and North Wales Shoreline Management Plan 2

[72] EurOtop Second Edition (2018) Manual on wave overtopping of sea defences and related structures: An overtopping manual largely based on European research, but for worldwide application

[73] EurOtop Second Edition (2007) Manual on wave overtopping of sea defences and related structures

Effects	Construction	Operation
	The beach recharge material could have an impact on the local coastal processes as it reaches its natural equilibrium. Small scale rock storage for any terminal groyne upgrade along the beach resulting in a localised change to coastal processes along the frontage.	
Potential Significant Effects	According to the criteria in Appendix C.5, we consider there are no significant effects during construction for coastal processes – however we are aware from previous schemes undertaken that the scoping in of construction is preferred by NRW. To allow for this we have scoped this chapter in for construction.	The Scheme is in line with the policy objectives for Colwyn Bay as it reduces the impact of coastal erosion and failure of the defences as a result of this. We predict a significantly beneficial effect which would be assessed in the ES. In the longer term, there could be changes in the longshore sediment movement along the frontage as a result of the proposed rock structures. This would be assessed during the detailed design process.
Scoped In/Out	**Scoped In**	**Scoped In**
Flood Risk		
Potential Insignificant Effects	Inundation of the construction site and equipment from overtopping could occur. It is assumed the Contractor would have a flood risk management plan in place.	Following construction, the presence of the recharged beach would reduce wave energy and hence damage of the sea wall and promenade during future storm events. Overtopping events would also be reduced in frequency and severity, a flood management plan is assumed to be produced for the operation of the scheme. The operational effects of the Scheme are therefore considered to be beneficial.
Potential Significant Effects	N/A	The Scheme is in line with the policy objectives for Colwyn Bay as it reduces the flood risk to the frontage. We predict a significantly beneficial effect which would be assessed in the ES.
Scoped In/Out	**Scoped Out**	**Scoped In**
Coastal Water Quality		
Potential Insignificant Effects	Potential contamination risks to surface waters from, for example, spillages, accidents and direct runoff during construction*	Potential ongoing effects relating to beach maintenance works and anticipated future beach/structure maintenance and management.
Potential Significant Effects	Potential for local marine water quality to be adversely affected during construction due to the import and deposition of dredged marine sediments and associated impacts on water quality – suspended sediments, turbidity etc. Potential for temporary effects on priority habitats and species relating to water quality.	Potential ongoing effects relating to anticipated future small scale beach recharge works. These are not anticipated to be significant but in the absence of sufficient information at the time of scoping, further consideration of these effects has been scoped in to the ES.

Effects	Construction	Operation
	Potential for construction phase effects on designated sites relating to water quality. Potential construction phase effects on Bathing Waters. Potential construction phase effects on designated Shellfish Waters.	
Scoped In/Out	**Scoped In**	**Scoped In**
Navigation		
Potential Insignificant Effects	Potential for sailing boats and jetskis not to have access to the area when construction is occurring. However, it is assumed that the Contractor would have mitigation in place to provide exclusion zones for the vessel and pipelines. Timescales for beach recharge are also anticipated to be relatively short (several months maximum).	Effects relating to on-going beach maintenance activities and small scale recharge operations.
Potential Significant Effects	**N/A**	**N/A**
Scoped In/Out	**Scoped Out**	**Scoped Out**

Source: Mott MacDonald Ltd, 2021

* Construction effects would be managed through the implementation of the CEMP and would be temporary in nature. During construction, contamination risks to surface waters from, for example, spillages, accidents and direct runoff would also be managed through the CEMP.

The construction methodology and CEMP would seek to minimise the suspension of sediment in the water column. During construction, there may be a need for monitoring of any sediments being re-suspended in the water column.

Particular consideration would be given in the CEMP to effects on water quality during the Bathing Season (May-September).

11.7 Additional information and assessments/reporting required in support of the ES

Potentially significant effects have been identified as being possible and consequently coastal processes and water quality have been scoped into the environmental statement. The following studies/consents/licences are anticipated to be required for the final Scheme:

- Marine Licence application;
- WFD Compliance Assessment;
- Crown Estates Consent;
- Construction Flood Risk Management Plan;
- Flood Management Plan – Defining the conditions requiring promenade/road closures during the operational phase; and
- Flood Consequence Assessment in accordance with TAN 15: Development and Flood Risk.

11.8 Proposed methodology

The proposed EIA methodology for the assessment of Coastal Processes effects can be found in Appendix C.5.

12 Geology and Soils

12.1 Introduction

This Chapter sets out the proposed scope for the assessment of the potential effects of the Scheme on geological sites, soil as a valuable resource, hydrogeology and considers effects from contaminated land on the Scheme.

Effects in relation to minerals resources and waste are considered within Chapter 14

12.2 Study Area

The study area for the assessment of geology and soils encompasses the area over which the Scheme could be reasonably expected to have an effect, which generally only relates to the areas anticipated to be directly disturbed by the proposed physical works and ground disturbance.

However, when considering the potential for contaminated land, sensitive off-site receptors which may feasibly be affected by the uncontrolled migration of contaminants off-site also need to be considered. In this instance, given the segregation of the Scheme from neighbouring sensitive residential receptors by the promenade along with the nature of the landward Scheme elements and lack of anticipated excavation, this is anticipated to comprise the marine waters of Colwyn Bay. Off-site current and historic sources of contamination within 100m of the Scheme boundary have also been considered.

12.3 Baseline conditions

12.3.1 Geological setting

12.3.1.1 Underlying geology

According to BGS mapping[74], bedrock geology across the Scheme comprises the Elwy Formation – Silurian mudstone, siltstone and sandstone. Immediately to the west at Rhôs-on-Sea is the Clwyd Limestone Group.

Superficial deposits comprise a combination of Devensian Till (diamicton) and Devensian Glaciofluvial Deposits along the Promenade and NWC Railway Line embankment, with Marine Beach Deposits present in the intertidal area.

12.3.1.2 Designated Sites of geological interest

There are no Geological Conservation Review Sites, Regionally Important Geological Sites (RIGS) or geologically designated Sites of Special Scientific Interest present within the study area[75].

12.3.1.3 Mining

There are no formal records of any mining within, or in close proximity to, the Scheme area.

[74] BGS Website: https://mapapps.bgs.ac.uk/geologyofbritain/home.html, Accessed March 2021
[75] Lle Geo portal for Wales website: http://lle.gov.wales/home, Accessed March 2021

12.3.1.4 Hydrogeology

The underlying bedrock deposits are classed as a Secondary B Aquifer (predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering), while the Glaciofluvial Deposits are classed as undifferentiated Secondary Aquifers due to their variable nature[76].

Groundwater beneath the Scheme area is part of the Conwy Groundwater Body (Waterbody ID GB41002G203000) which has overall Poor status (Quantitative: Good, Chemical: Poor)[77].

The Scheme area is not considered to be sensitive from a groundwater perspective given the above and the likelihood for saline intrusion.

12.3.2 Soils

12.3.2.1 Site soil resources

There is no agricultural land present within the main Scheme construction area. Topsoils are present along Cayley Embankment however these would remain in place and are not to be removed during construction.

12.3.2.2 Land use history

Please refer to Section 8.3.2.

12.3.2.3 Contamination potential

There are no current or historic potentially contaminative land uses present within the Scheme area. The only potentially contaminative land use in close proximity to the Scheme is the adjacent NWC Railway Line , however this is not to be disturbed as part of the Scheme. In addition, there is likely to be Made Ground present beneath the promenade from its construction.

A ground investigation has been completed for the Scheme and reporting is currently awaited at the time of writing. However it is understood that there was no visual or olfactory evidence of contamination encountered.

In general, there is considered to be a very low potential for there to be contamination present beneath the Scheme.

There are no landfills present within or in close proximity to the study area.

12.4 Assumptions and limitations

- The Scheme-specific ground investigation has been completed at the time of writing and the factual reporting is awaited, therefore the current understanding of the geology underlying the Scheme is from desk based studies;
- The effects of material import and export along with waste generation would be considered in Chapter 14;
- It has been assumed that there would be no loss of soils along Cayley Embankment; and
- It has been assumed that an outline CEMP would be developed as part of the ES which would be used to inform a full CEMP to be produced by the appointed contractor. This CEMP would be in place for the construction period and would include the reasonable and practical measures required to prevent the pollution of underlying soils/geology along with

[76] Multi Agency Geographic Information for the Countryside website: http://lle.gov.wales/home, Accessed March 2021
[77] Water Watch Wales website: http://lle.gov.wales/home, Accessed March 2021

the erosion, deterioration and consolidation of adjacent soils along the NWC Railway Line embankment (if applicable).

12.5 Key guidance and best practice

Key legislation and guidance for geology and soils includes the following:

- The Wildlife and Countryside Act 1981 (as amended) and Countryside Rights of Way Act 2008 (For Geological Sites of Special Scientific Interest (SSSI));
- Planning Policy Wales, Edition 11 (February 2021), which specifically identifies the protection of soils as helping to meet the Well-Being of Future Generations (Wales) Act Goal 'A Resilient Wales';
- The Environmental Protection Act 1990 – contamination associated with land that is being redeveloped is managed through the planning system. Contaminated land must be considered in the context of the development proposals and remediated such that the land is suitable for its intended use. Once remediated, land should not be capable of being determined as "contaminated land" under the provisions of Part 2A of the Environmental Protection Act 1990;
- The Contaminated Land (Wales) Regulations 2006 (as amended); and
- The most current framework for the assessment of potential land contamination – the Environment Agency Land Contamination Risk Management Guidance (December 2020)[78].

12.6 Potential effects

The potential effects of the Scheme on geology and soils are summarised within Table 12.1. The effects assume the application of best practice construction methods throughout the construction period. A confirmatory scoping opinion for this discipline is requested from CCBC and any relevant statutory consultees.

Table 12.1: Potential effects (assuming standard mitigation)

Effects	Construction	Operation
Potential Non-Significant Effects	There are no geologically designated sites within the Scheme area. Effects in relation to the underlying geology are anticipated to be negligible given the proposals are predominantly concerned with maintaining or raising levels rather than lowering them (with the exception of anticipation of minor localised excavations in relation to services). There are no agricultural soils within the Scheme area. While there is the potential for enhancing Cayley Embankment ecologically, it is assumed that this would not include the removal of any topsoils or subsoils. With best practice applied during the construction period, effects are anticipated to be negligible. From the assessment of site history, the Scheme area does not include any potentially contaminative past land uses. Contaminated land is not anticipated to be encountered and therefore significant adverse effects associated with contaminated land are not anticipated. Effects on groundwater within this non-sensitive area are anticipated to be negligible.	The completed and operational scheme is not expected to result in any impacts on geology or soils.

[78] UK Government website for land contamination assessment advice: https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm, Accessed March 2021

Effects	Construction	Operation
Potential Significant Effects	None	None
Scoped In/Out	**Scoped Out**	**Scoped Out**

Source: Mott MacDonald Ltd, 2020

The construction of the Scheme as well as its operation are not expected to result in any significant adverse effects on geology or soils, and this discipline is therefore proposed to be scoped out of the ES.

There are no opportunities for additional enhancement in relation to geology and soils for the Scheme given the nature of the development.

12.7 Additional information and assessments/reporting required in support of the ES

While geology and soils have been scoped out of the EIA process, the following has been identified as being necessary to manage non-significant effects:

- A ground investigation report providing details of the ground conditions encountered during the recent ground investigation and including an assessment of risk from any contamination found to be present.

13 Landscape and Visual

13.1 Introduction

This Chapter sets out the proposed scope for the assessment of the potential effects of the Scheme on landscape character and visual amenity. The landscape and visual impact assessment (LVIA) would address two separate but related issues:

- Effects on landscape as a resource in its own right; and
- Effects on people's views and visual amenity.

The assessment of landscape effects is also linked to the following environmental disciplines: historic environment, ecology, socio-economy, noise and traffic.

13.2 Study Area

In the absence of a Zone of Theoretical Visibility (ZTV) for the Scheme, the study area has been defined from a desk-based study using online mapping and aerial imagery tools along with a site visit. The visual envelope is defined as an area 150m to the south-west of the RLB due to the raised landform in this direction, and 1.0km north-east of the RLB. The RLB extends approximately 1.0km between Rydal Boat Store to Rhôs-on-Sea Harbour for the promenade works and approximately 1.5km between the Horizon Shine kiosk to Rhôs-on-Sea Harbour for beach recharge (with beach management and the potential for localised 'topping up' of beach levels to extend as far as Porth Eirias to the east).

The site consists of approximately 1.5km of shoreline and adjacent infrastructure in between the Horizon Shine kiosk in the east to Rhôs-on-Sea Harbour in the west. It includes the West Promenade for most of the length of works with a potential one-way system to include Cayley Promenade on higher ground to the south-west. The rising land to the south-west is a visual barrier to views to and from the seafront in a landward direction. The residential areas that lie on elevated land to the south-west, also provide visual screening between the seafront and streets and footpaths inland to the south-west. The North Wales Coast Path long distance footpath and Sustrans North Wales Coast Cycle Route 5 follow the coastline along the West Promenade for the entirety of the Scheme.

To the north-east of the site boundary lies Colwyn Bay. As the coast curves to the east is visible against the skyline.

13.3 Baseline conditions

13.3.1 Landscape

13.3.1.1 National Character Areas Assessments

The study area lies within National Landscape Character Area 08 (NLCA08)[79]: North Wales Coast. The key characteristics of relevance to the study area are:

- Seaside resort towns – urban development and arterial road and railway routes along the coast, constricted in places by topography and rising hills. Much 19th century development with more recent suburban development; and

[79] Natural Resources Wales; 2015; https://cdn.naturalresources.wales/media/682560/nlca08-north-wales-coast-description.pdf?mode=pad&rnd=131550577050000000, Accessed March 2021

- A generally man-made coastal edge – promenades, sea walls, groynes, rock armour and other forms of protecting the coastal edge run along the majority of the coastline.

13.3.1.2 Local Character Areas Assessments

LANDMAP[80]: is a tool developed by NRW to help sustainable decision-making and natural resource planning at a range of levels from local to national. Included in LANDMAP are five national datasets; Geological Landscape, Landscape Habitats, Visual and Sensory, Historic Landscape and Cultural Landscape. The site is included within the following LANDMAP character areas:

Visual and Sensory

Colwyn Bay (Development/Built Land/Urban – Level 3)

The settlement is a series of towns joined in a conurbation including Colwyn Bay, Old Colwyn and Rhôs-on-Sea. It is a major coastal resort on the North Wales coast with a promenade and, in Colwyn Bay a grid iron pattern and some elegant Victorian built form in its core. The settlement is orientated towards the Bay with its beach and promenade and pier (now-demolished which is currently being re-built in truncated form), but for much of its frontage to the core and east, the town is separated from the beach by the A55 Expressway and NWC Railway Line. This disrupts the relationship and reduces tranquillity. There are many hotels and leisure uses. Eirias Park is a positive green space giving relief to the built form. The settlement expands to the south, east and west in housing estates and is most noticeable to the south on steeper slopes which form a positive backcloth. Superb views are possible out to sea and the coastal hills enclose the area and views are possible to the Little Orme. These views now include views out to the noticeable Rhyl Flats and Gwynt y Môr offshore windfarms.

The promenade allows positive views of the bay and the built form of the core is pleasing in its composition. The promenade and core have strong integrity with coherent form, with the core having the strong character of a Victorian seaside resort with fine buildings. The rest of the town is incoherent and has a weak character. The resort is only moderately rare in its core's coherence and condition.

Historic Landscapes

Colwyn Bay (Non-nucleated Settlement – Level 3)

Colwyn Bay is a quintessential Victorian seaside town, developed from about 1865, with wide 19th century streets, seafront promenades and a pier (now-demolished which is currently being re-built in truncated form), but also a great deal of modern recreational development. Despite this, it incorporates the four older settlements Llandrillo-yn-rhôs, Rhôs-on-Sea , Old Colwyn and Rhydlydan. Of these Llandrillo-yn-Rhôs, which reputedly has its origins in the 6th century, was certainly a significant smaller settlement in medieval times with an extensive parish attached to its church.

Rhôs-on-Sea also has medieval roots and is documented as the site of a 9th century monastery which appears to have survived into the 13th century when its holdings were transferred to the Cistercian monastery at Aberconwy. Apart from the curious (and supposedly 6th century but more likely late medieval) St Trillo's chapel perched on the concrete sea wall at Rhôs-on-Sea, nothing survives to demonstrate either settlement's early credentials. Rhôs-on-

[80] Natural Resources Wales (2019) [Online] Available at: https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/evidence-to-inform-development-planning/landmap-the-welsh-landscape-baseline/?lang=en Accessed March 2021

Sea seems to have functioned as a port during the post medieval period, but similarly little evidence of this activity survives.

What is now Old Colwyn does not appear in any records until 1736, and Rhydlydan is no older than the late 18th century. Colwyn Bay does however encompass the Iron Age Hillfort at Bryn Euryn (itself apparently reused in the early medieval period when it was the stronghold of Cynlas the Red, the 6th century king of Rhôs), which lies adjacent to the now ruinous medieval manor house of Llys Euryn.

Marine Character Areas

The study area lies within Marine Character Area 02 (MAC02)[81] Colwyn Bay and Rhyl Flats. The key characteristics of relevance to the study area are:

- Constantly shifting sandbanks with changing depths; hazards marked by numerous buoys, lights and fog horns;
- Developed coastline with many seaside resort towns, notably Llandudno (and pier), Colwyn Bay (and former pier location), Rhyl and Prestatyn, the latter having many caravan and chalet parks on their fringe. The coast serves as a traditional holiday destination;
- Recreational activity includes water sports such as jet skiing and speed boating;
- North Wales Coast Path and a popular cycleway run the length of the coastline. Collectively the A55 Expressway, A548 and NWC Railway Line follow close to the coastline; and
- Colwyn Bay is a popular shore and boat angling area.

13.3.1.3 Local landscape character

The waterfront is characterised by the long promenade and seascape views. Some stretches of the promenade have been re-configured as part of Phases 1a,b,c and 2a of the Colwyn Bay Waterfront Project.

There is a gentle rise in topography from the beach to the existing promenade and road level before meeting the base of the Cayley Promenade embankment. On the eastern side of West Promenade, a well-mown, grass embankment rises steeply up to Cayley Promenade.

13.3.1.4 Landscape designations

There are several designations within the vicinity of the Scheme or the local area which are of note. These are:

- Snowdonia National Park; approximately 8.0km west and south of the Scheme;
- Much of the Creuddyn peninsula is designated as a Special Area of Conservation (SAC), Site of Special Scientific Interest (SSSI), and Heritage Coast;
- Areas within Colwyn Bay (predominantly town centre) and Rhôs-on-Sea (village centre and sea front) are designated as Conservation Areas; and
- Listed Buildings within Colwyn Bay and Rhôs-on-Sea .

13.3.1.5 Landscape quality

The scenic quality of the landscape within the study area is high, with broad, expansive views along the coast. The scenic quality is slightly diminished by the condition of the landscape, which has a few detracting elements such as extensive car-parking and aging public realm. The

[81] Natural Resources Wales (2015) [Online] Available at: https://cdn.naturalresources.wales/media/674480/mca-02-colwyn-bay-and-rhyl-flats-final.pdf?mode=pad&rnd=131502219930000000 Accessed March 2021

area is popular for recreation and travelling towards Rhôs-on-Sea , the landscape has greater conservation interest, particularly in the area of the harbour and conservation area.

This landscape is not rare, locally or nationally, and is somewhat representative of a Victorian-era seaside resort but has undergone significant change since it was established as a resort.

In summary, the landscape has high scenic quality, is in medium condition, has some conservation interest and is not rare or highly representative.

13.3.2 Visual

Visual receptors potentially affected by the Scheme include:

- People in residential properties;
- Walkers and visitors using Public Rights of Way (PRoW), national trails and paths through a high-quality landscape;
- Visitors to local assets;
- People walking along footways in residential areas; and
- People travelling on urban roads.

The following visual receptors may experience views of the Scheme:

- Walkers along the beach, Promenade and the North Wales Coastal Path;
- Visitors to Porth Eirias;
- Cyclists along the Sustrans National Cycle Route 5;
- People in and on the sea;
- Transport users along the Promenade; and
- Residents along Cayley Promenade.

13.4 Assumptions and limitations

- Where applicable, receptors would be grouped for the purpose of the LVIA;
- In the absence of ZTV modelling for the Scheme, the visual baseline was established as part of a desktop study and a site visit; and
- In the absence of details regarding the construction programme and construction logistics, it is assumed that construction traffic would access the Scheme using the existing roads (A55 Expressway, the Promenade and the West Promenade) and a section of the West Promenade and sea front would be closed to users during the construction period.

13.5 Key guidance and best practice

The assessment would be carried out with due regard to the following:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA), 3rd Edition: (Landscape Institute and Institute of Environmental Management and Assessment, 2013); and
- NRW: National Landscape Character Areas and Marine Character Areas.

13.6 Potential effects

The following have been considered in the determination of the potential landscape and visual amenity effects (as summarised in Table 13.1) associated with the Scheme:

- The likely nature, extent and scale of the Scheme to determine effects of change and development;

- The likely nature and scale of landscape effects (adverse, neutral or beneficial) during the construction and operation of the Scheme;
- The likelihood of the Scheme to affect aesthetic and perceptual aspects of the landscape, its distinctive character and its elements; and
- Issues likely to require further assessment together with the methods to be applied.

13.6.1 Construction

The most apparent change to the character of the landscape and the visual amenity of recreation users of the sea front, drivers and residents would result from the presence of construction plant and compounds during construction of the proposed scheme. The effects, however, would be temporary.

The potential impacts on landscape character and visual amenity during construction would include:

- Presence of construction traffic, construction plant and equipment;
- Construction activity, generating noise and movement;
- Earthworks, changes in landform and storage of soils and rock groyne materials;
- Presence of construction compounds, temporary security fencing and hoardings;
- Vehicle movements including private vehicles belonging to site staff;
- Use of lighting, if night-time works are required and security lighting; and
- Transfer of traffic onto Cayley Promenade.

13.6.2 Operation

The most apparent changes to landscape and views would result from:

- The beach recharge;
- Any upgrade to the terminal groyne at Rhôs-on-Sea ;
- The upgrading and improvement of the promenade public realm and street furniture; and
- The potential permanent reorganisation of traffic flow onto Cayley Promenade.

13.6.3 Summary of potential effects

A summary of the potential landscape and visual amenity effects for both construction and operation is provided within Table 13.1. A confirmatory scoping opinion is requested from all relevant statutory consultees.

Table 13.1: Potential effects

Effects	Construction	Operation
LANDSCAPE EFFECTS		
Potential Non-Significant Effects	It is assumed that a section of the Promenade and North Wales Coastal Path would be diverted during construction resulting in reduced connectivity and therefore adverse landscape effects.	There is potential to be landscape effects for NCLA08, however the nature of the Scheme is in keeping with the existing character of the local area with numerous examples of coastal defence schemes along the sea front in the surrounding area. Effects relating to beach maintenance and small scale recharge.

Effects	Construction	Operation
Potential Significant Effects	There is potential for there to be a direct effect on landscape character area NLCA08 during construction.	None identified.
Scoped In/Out	**Scoped In**	**Scoped Out**
VISUAL EFFECTS		
Potential Non-Significant Effects	For residents along Cayley Promenade and connected streets with properties facing the proposed scheme, elements of construction activity would be visible across a proportion of the view. There is potential for the temporary pipeline construction taking place at Pensarn to be visible from the Promenade and the North Wales Coast Cycle Route. However, the pipeline construction would be temporary for a short period of time (understood to be weeks rather than months) and would therefore be **scoped out** of the assessment.	Some elements of the proposed coastal defence scheme (e.g. improvements to the terminal groyne) could be visible but would be viewed in context of the surrounding schemes to the west and east and the replacement of existing flood defence infrastructure, resulting in limited perceived change to the baseline visual amenity. Effects relating to beach maintenance and small scale recharge.
Potential Significant Effects	It is assumed that the Promenade and sections of the Wales Coast Path long distance footpath and Sustrans North Wales Coast Cycle Route would be inaccessible for walkers and cyclists during the construction phase of the Scheme. The effect of construction on the visual amenity of these receptors would depend upon the route of the diverted footpath/cycle route.	Increased traffic on Cayley Promenade resulting from the potentially reorganised road scheme, would be visible from properties on this street and potentially from surrounding streets. The creation of a new permanent beach (even at high tide) with improved access is likely to provide a significant benefit for a number of receptors.
Scoped In/Out	**Scoped In (excluding Pensarn pipeline construction)**	**Scoped In**

Source: Mott MacDonald Ltd, 2020

The Scheme is likely to result in significant landscape and visual effects during construction, affecting receptors that would be classed as highly sensitive (residents, recreational users of the sea front and associated facilities and recreational users of the PRoW and cycle network).

The majority of landscape and visual effects during operation are likely to be minor adverse or minor beneficial, for the following reasons:

- The character of the landscape would remain comparable to the baseline with no significant changes to land use and slight benefits to visual amenity in a more holistic way to the sea front; and
- For the majority of visual receptors, elements within the view including existing coastal defences, promenade, beach and the sea, would be comparable to the baseline. There is the opportunity for any adverse visual effects to be minimised through careful design and integration of the Scheme into the existing landscape and seascape.

However there is the potential for the recharged beach (to be accessible at all tidal states) to result in a significant beneficial effect for a large number of receptors.

There is potential for properties on Cayley Promenade and connected streets to be subject to visual effects, as a result of increased traffic in relation to the preferred option of a one-way system.

13.7 Additional information and assessments/reporting required in support of the ES

- Running a ZTV for the Scheme.

13.8 Proposed methodology

The proposed EIA methodology for the assessment of Landscape and Visual effects can be found in Appendix C.6.

14 Materials and Waste

14.1 Introduction

This Chapter sets out the proposed scope for the assessment of the potential effects of the Scheme on materials and waste.

The materials, resources and waste assessment within the EIA would assess the potential impacts on material resources and waste management infrastructure which are likely to arise from the construction and operation of the Scheme. This Chapter provides a description of the baseline, identifies the potential impacts and sets out the proposed methodology for informing the EIA. For the purposes of this Scoping Report, the assessment scope comprises:

- The use of material resources; and
- The generation and management of waste.

14.1.1 Reference reporting

A Design for Resource Efficiency (D4RE) workshop would be undertaken in April 2021 to record opportunities to reduce or reuse resources within this Scheme. The output can be used for a Resource Management Plan or other such plans to include resource efficiency at the early design stage.

14.2 Study Area

The assessment would use two geographically different study areas to examine the use of material resources and the generation and management of waste impacts. The first study area is based on the area of the completed works within the boundary of the Scheme, as this constitutes the area within which construction materials would be consumed (used, reused and recycled) and waste would be generated.

The second study area usually focuses on an area sufficient to identify the suitable waste infrastructure that could accept arisings or waste generated by the Scheme options, and feasible sources and availability of construction materials typically required for the works. For this Scheme this second study area would encompass the North Wales region.

14.3 Baseline conditions

14.3.1 Use of material resources

Information on the demand for key construction materials, within the second study area has been used to provide the baseline for material resources. In addition, information for the UK has also been provided as a national comparison. This information has been determined through a desk-study using a number of readily available resources, in particular from the Minerals Products Association, World Steel Association, BGS, NRW and CCBC[82].

Table 14.1 outlines the UK demand, in terms of sales, of minerals and mineral products in 2018 (and 2020 for steel) and Table 14.2 outlines the production of minerals within Wales in 2018 and available mineral workings.

[82] Where information is not available for Wales, the UK has been used to provide the national comparison.

Table 14.1: UK demand of materials and minerals / mineral products

Mineral	UK Demand (year)
Aggregates	251 million tonnes
Of which:	
Crushed rock	128.6 million tonnes
Sand and gravel – land won	51.5 million tonnes
Sand and gravel – marine won	17.81 million tonnes
Recycled and secondary (2017)	64.6 million tonnes
Finished Cement consumption	15.19 million tonnes
Ready-mixed concrete	25 million cubic meters
Apparent Steel use	11.2 million tonnes

Source: BGS (2019)[83],[84] United Kingdom Minerals Yearbook 2019[85] and World Steel Association (2020)[86]

Table 14.2: Wales production of minerals in 2018

Mineral	Wales Production in Tonnes	Number of Mineral Workings in Wales
Igneous rock Limestone and dolomite Sandstone	12,711,000 (excluding building stone)	50
Sand and gravel	1,517,000	18

Source: BGS[87]

At a regional level, Table 14.3 and Table 14.4 outline the aggregate sales and reserves in Conwy and North Wales. It is outlined in the North Wales Regional Aggregate Working Parties[88] Regional Technical Statement that Flintshire's Carboniferous Limestone quarries and the regions in the north east of Wales are major markets for crushed rock. Conwy (reported with Snowdonia National Park Authority (NPA) for confidentiality reasons) produced an average of 0.955 million tonnes per year of crushed rock in a 10-year period to 2016.

Table 14.3: 10 year and 3 year total land won primary aggregate sales average (to 2016) for Conwy and North Wales

Aggregate	10y Average aggregate sales (mtpa)	3y average aggregate sales (mtpa)	Proportion from crushed rock sources	Annual sales, 2016 (mT)
North Wales Sales (to 2016)	5.468	5.77	86.6%	5.749
Conwy+ Snowdonia NP (to 2016)	0.955	0.813	100%	

Source: Regional Technical Review (2nd Review)[89]

[83] British Geological Society (2019) United Kingdom Minerals Yearbook 2018 [online] available at: UK mineral statistics | MineralsUK (bgs.ac.uk) Accessed March 2021

[84] Contribution of Recycled and Secondary Materials to Total aggregate supply in Great Britain in 2018. [online] available at: Recycled & Secondary Aggregates (mineralproducts.org) Accessed March2021

[85] United Kingdom Minerals Yearbook 2019, [Online] Available at: UKMY2019.pdf (bgs.ac.uk) Accessed March 2021

[86] Steel Statistical Yearbook 2020: concise version. [online] available at: Statistical reports | worldsteel. Accessed March 2021

[87] British Geological Society (2019) United Kingdom Minerals Yearbook 2019 [Online] Available at: https://www.bgs.ac.uk/mineralsuk/statistics/UKStatistics.html Accessed March 2021

[88] North Wales Regional Aggregate Working Party RTS 2nd Review – Appendix A (North Wales)

[89] Regional Technical Review (2nd review) Appendix A (North wales) Consultation draft September 2019. [Online] Available at: 1 (nwrawp-wales.org.uk) Accessed March 2021.

Table 14.4: Allocations required for land-won sand and aggregates – North Wales

	Annualised apportionment for sand and gravel (mT)	Existing permitted reserves at end of 2016 (mT)	Existing landbank (years)
Conwy+ Snowdonia NP	0	0	n/a
North Wales	1.044	15.196	-

Source: Regional Technical Review (2nd Review)[90]

The Regional Technical Statement[91]does not quantify the recycled aggregates from industrial and commercial development and redevelopment.

The Local Development Plan for Conwy[92], under Policy MWS/3, expresses that areas of hard rock and sand and gravel have been identified requiring protection (safeguarding) to ensure these resources remain available throughout 2007-2022. Safeguarded Sand and Gravel Reserves just extend into the Scheme boundary from the east and adjacent to the western boundary, and a Safeguarded Hard Rock Reserve is located adjacent to the eastern boundary[93].

14.3.2 Generation and management of waste

The most recent information available relating to current waste generation and operational waste infrastructure in the North Wales region, and where available Conwy, has been gathered to provide the baseline for this assessment. Information on the current waste arisings and the capacity of waste management infrastructure has been determined through a desk-top study, using a number of readily available resources, in particular data from NRW, Welsh Government, and CCBC.

14.3.2.1 Waste generation in North Wales and Wales

The latest published data from the NRW indicated that Conwy received over 0.19 million tonnes of waste in 2019. This equates to 2% of the 9.37million tonnes of waste generated in Wales in 2019[94],[95]. The latest publicly available, information of waste received by site type in Wales and its regions is for 2013, shown in Table 14.5.

Table 14.5: Waste Breakdown by site type (2013)

Site Type	North Wales (tonnes)	Wales (tonnes)
Landfill	449,000	2,138,000
Transfer	346,000	1,022,000
Treatment (excluding metal recycling sector)	577,000	2,667,000
Metal Recovery	78,000	829,000
Incinerated	35,000	48,000

[90] Regional Technical Review (2nd review) Appendix A (North wales) Consultation draft September 2019. [Online] Available at: 1 (nwrawp-wales.org.uk) Accessed March 2021.

[91] Regional Technical Review (2nd review) Appendix A (North wales) Consultation draft September 2019. [Online] Available at: 1 (nwrawp-wales.org.uk) Accessed March 2021

[92] CCBC (2013) Conwy Local Development Plan 2007-2022 Adopted October 2013 [Online] available at http://www.conwy.gov.uk/en/Resident/Planning-Building-Control-and-Conservation/Strategic-Planning-Policy/Adopted-Local-Development-Plan-LDP/Assets-written-proposals-maps/Conwy-Local-Development-Plan-2007-2022.pdf Accessed March 2021

[93] CCBC (n.d.) Map: Adopted LDP [online] available at http://conwy.opus3.co.uk/ldf/maps/Adopted%20LDP#x=286368.23958809&y=378647.50677331&scale=10000&1223 Accessed March 2021

[94] Natural Resources Wales (2021) Waste Permit Returns Data Interrogator [online] available at https://data.gov.uk/dataset/71d7279f-a6aa-4a60-a9fa-51406b223277/waste-permit-returns-data-interrogator Accessed March 2021

[95] Natural Resources Wales (2021) Waste Permit Returns Data Interrogator [online] available at Lle - Waste Permit Returns Data Interrogator (gov.wales) Accessed March 2021

Land Disposal	81,000	162,000
Total	1,566,000	7,910,000

Source: Natural Resource Wales[96]

Construction and demolition waste

With respect to construction and demolition (C&D) waste, NRW recorded that 0.74 million tonnes C&D waste was generated in 2012 in North Wales, with approximately 50,000 tonnes sent to landfill.

Data from The Wales Construction and Demolition Waste Generation Survey 2012[97], shows that approximately 0.68 million tonnes of C&D waste being recovered or recycled in 2012 (92% of the total generated). It did not clarify the quantities of inert, non-hazardous and hazardous C&D waste generated in North Wales. A construction and demolition waste survey for 2019 was undertaken and will be presented in a final report, due March 2022[98].

Hazardous waste

Regarding hazardous waste, Table 14.6 outlines the quantities managed and deposited in 2019 in Wales. An estimate of the tonnes of hazardous waste generated by the C&D sector is unavailable, however the Hazardous Waste Interrogator 2019 indicates the amount of construction materials/ C&D waste containing dangerous substances.

North Wales does not have any hazardous waste landfill facilities. Therefore, any hazardous waste from the Scheme that requires landfilling would need to be moved to other Welsh regions or exported. In 2019, 100% of hazardous waste from North Wales was exported to England[99].

Table 14.6: Hazardous waste managed and deposited in 2019

Hazardous waste fate	Conwy (tonnes)	North Wales (tonnes)	Wales (tonnes)
Incineration with energy recovery	0	195	958
Incineration without energy recovery	13	1,107	4,083
Landfill	41	28,988	36,936
Long term storage	0	0	437
Other Fate	0	0	0
Recovery	1,262	17,952	55,368
Rejected	49	206	273
Transfer (D)	86	2,581	8,643
Transfer (R)	439	9,221	27,131
Treatment	805	10,763	30,946
Total	**2,695**	**71,013**	**164,775**
Hazardous waste from construction	45.5	2290.5	3727.19

Source: Hazardous Waste Interrogator (2019)[100]

[96] Natural Resources Wales (2013) Wales waste data information 2013 [Online] Available at: https://naturalresources.wales/evidence-and-data/research-and-reports/waste-reports/wales-waste-data-information-2013/?lang=en Accessed March 2021

[97] Natural Resources Wales (2012) Construction and Demolition waste generated in Wales 2012 [Online] Available at: https://naturalresources.wales/evidence-and-data/research-and-reports/waste-reports/construction-demolition-waste-survey/?lang=en Accessed March 2021

[98] Natural Resources Wales (2021). Construction and Demolition waste generated in Wales in 2019. [Online] available at: Natural Resources Wales / Construction and demolition waste survey for 2019. Accessed March 2021.

[99] Hazardous Waste Interrogator (2019) [Online] available at: ArcGIS Enterprise (data.gov.uk) Accessed March 2021.

[100] Hazardous Waste Interrogator (2019) [Online] available at: ArcGIS Enterprise (data.gov.uk) Accessed March 2021.

14.3.2.2 Potential sources of hazardous waste arisings

To identify potential sources of contamination an initial review of the landfill sites, both authorised and historic, in the area was undertaken. Potential sources of contamination that are greater than 500m away from the study area have been identified but not considered further, as these are deemed unlikely to affect the Scheme.

14.3.2.3 Waste management facilities

Landfills

Wales waste data information from 2013, is the latest publication regarding the remaining capacity of landfill in north Wales[101]. Table 14.7 presents the remaining landfill capacity in north Wales.

Table 14.7: Landfill capacity in 2013 in north Wales

Landfill Type	North Wales (m^3)	Wales (m^3)
Hazardous Restricted	0	191,000
Inert	1,715,000	3,176,000
Non-hazardous	4,074,000	17,751,000
Non-hazardous (SNRHW)*	0	3,126,000
Restricted user	66,000	5,926,000
Permitted, but not constructed	0	1,090,000
Total	5,855,000	31,261,000

Source: Natural Resources Wales (2013)[102] Note: *Some non-hazardous sites can accept some Stable Non-Reactive Hazardous Wastes (SNRHW) into a dedicated cell, but this is usually a small part of the overall capacity of the site.

North Wales region's total lifespan for landfill is less than the other regions in the country, with an estimated 8.3 years from 2013[103]. However, 30% of the total capacity of landfill in North Wales is for inert waste at 1,715,000m^3, in 2013. Conwy region has two operational landfill facilities, of which permitted tonnage and remaining capacity are available for Tŷ Mawr Farm Landfill and Llanddulas Landfill, as shown in Table 14.8.

Table 14.8: Landfills within 10.0km for C&D waste

Site Name	Waste Activity	Distance from Scheme (km)	Permitted Tonnage m3	Remaining Capacity from 2018, m^3
Tŷ Mawr Farm Landfill	L05 - Inert Landfill	9.94	99,000	397,791
	A06: Landfill site taking other waste	9.94	0	
Llanddulas Landfill Phase 1 & 3	A01: Co-Disposal Landfill site	5.34	0	167,922
Llanddulas Landfill Phase 2	Non-hazardous landfill	5.32	0	

[101] Natural Resources Wales (2013) *Wales waste data information 2013* [online] available at https://naturalresources.wales/evidence-and-data/research-and-reports/waste-reports/wales-waste-data-information-2013/?lang=en Accessed March 2021

[102] Natural Resources Wales (2013) *Wales waste data information 2013* [Online] Available at: https://naturalresources.wales/evidence-and-data/research-and-reports/waste-reports/wales-waste-data-information-2013/?lang=en Accessed March 2021

[103] Natural Resources Wales (2013) *Wales waste data information 2013* [online] available at https://naturalresources.wales/evidence-and-data/research-and-reports/waste-reports/wales-waste-data-information-2013/?lang=en Accessed March 2021

Source: NRW[104,105]

Other waste management facilities

A search on the public registers for permitted waste facilities shows that there are seven waste facilities within Conwy, of which six may be able to treat or transfer C&D waste and are all within 10.0km of the Scheme at LL28 4BU, as shown in Table 14.9. Not all treatment facilities may be suitable for the project, but it demonstrates that there are treatment facilities available within the county which may be able to accommodate the waste that would be generated in this project.

Table 14.9: Permitted sites within 10.0km for C&D waste recycling and recovery

Site Name	Waste Activity	Distance from scheme (km)
Llanddulas Composting Facility	Composting Facility	0.6
Plas Gwilym Quarry	Transfer Station taking Non-Biodegradable Wastes	0.96
Bron Y Nant Road Waste Transfer And Materials Reclamation Facility	Household, Commercial & Industrial Waste Transfer Stn	1.8
Worldcare Recycling	Physical Treatment Facility	5.21
Worldcare Wales Ltd	Household, Commercial & Industrial Waste Transfer Stn	5.26
Llanddulas Quarry Waste Treatment Centre	Household, Commercial & Industrial Waste Transfer Stn and Physical Treatment Facility	5.4

Source: NRW (2020)[106]

In addition to permitted C&D waste management sites, inert material is also managed on sites that have a NRW environmental permit exemption. These exempt sites generally comprise land restoration activities such as restoring mineral voids, engineering/landscaping schemes and for agricultural improvements on farmland.

Although small tonnages of waste from other waste streams (e.g. biodegradable waste) may be managed at locations with an exemption, the largest tonnage of exempt activities is likely to involve C&D material. In December 2021, 127 exceptions were held in Conwy for activities identified as possibly being suitable to received wastes from construction and demolition activities, of which 11 were undertaken at Colwyn Bay area[107]. However, these exempt sites are often short-lived, and therefore, should be identified upon commencement of construction.

Reuse, recycling and recovery of wastes, on- or off-site, would be prioritised. However, if these options are not available or feasible the last resort option is to adopt the Proximity Principle for disposal to land. Tŷ Mawr Farm Landfill being within the 10.0km radius may be suitable for inert construction and demolition waste and should be considered first as means of disposal before arranging for waste to be transported at greater distance.

14.4 Assumptions and limitations

Given the early stages of design, estimates relating to the quantity of materials required are not available nor are there estimates available relating to the quantity of waste arisings anticipated.

[104] Natural Resources Wales (2021) Environmental Permitting Regulations – Waste Sites [Online] Available at: Lle - Environmental Permitting Regulations – Waste Sites (gov.wales) Accessed March 2021

[105] Natural Resources Wales (2021) Remaining Landfill void in Wales [Online] available at: Lle - Remaining Landfill Void in Wales (gov.wales) Accessed March 2021

[106] Natural Resources Wales (2021) Environmental Permitting Regulations – Waste Sites [Online] Available at: Lle - Environmental Permitting Regulations – Waste Sites (gov.wales) Accessed March 2021

[107] Natural Resources Wales (2021) Waste Management License Current Exemptions [online] available at http://lle.gov.wales/catalogue/item/WasteManagementLicenseCurrentExemptions/?lang=en Accessed March 2021

As such, a qualitative assessment has been carried out at this stage, limited to identifying activities that are likely to require significant quantities of materials, or are likely to produce significant quantities of waste. The following assumptions are made:

- This assessment would not consider the environmental effects associated with the extraction of raw materials used for the manufacture of products (which may occur outside of the UK). These stages of the products' or materials' lifecycles are outside of the scope of the assessment, due to the range of unknown variables associated with the processes involved;
- Adverse environmental effects through transportation (both to and from site) and contaminated land is more logically to be dealt with in other relevant discipline Chapters; and
- The procurement of the materials required for the construction of the Scheme is unknown at this stage. It has been assumed that not all materials would be available to be sourced regionally, and that the majority would be sourced nationally or elsewhere in the UK, which represents the (environmentally) worst case scenario.

14.5 Key guidance and best practice

The following legislation would underpin the assessment and would be described in detail in the assessment:

- The Environmental Protection Act (1990)[108];
- The Hazardous Waste (England and Wales) Regulations (2005)[109] as amended;
- The Waste (England and Wales) Regulations (2011)[110] as amended;
- The Landfill (England and Wales) Regulations (2002) as amended[111]; and
- The Environmental Permitting (England and Wales) Regulations (2016)[112].

The following guidance would underpin the assessment and would be described in detail in the assessment:

- Interim Advice Note (IAN) 125/09(W) Supplementary Guidance for Users of DMRB Volume 11 'Environmental Assessment'[113];
- DMRB Vol 11, Sec 3, Part 13 LA110[114];
- Minerals Technical Advice Note (MTAN) Wales 1: Aggregates[115];
- Technical Advice Note (TAN) 21: Waste[116];

[108] Her Majesty Government (UK) (1990) Environmental Protection Act 1990 [Online] Available at: http://www.legislation.gov.uk/ukpga/1990/43/contents Accessed March 2021

[109] Her Majesty Government (UK) (2005) Hazardous Waste (England and Wales) Regulations 2005 [Online] Available at: http://www.legislation.gov.uk/uksi/2005/894/contents/made Accessed March 2021

[110] Her Majesty Government (UK) (2011) Waste (England and Wales) Regulations (2011) [Online] Available at: http://www.legislation.gov.uk/uksi/2011/988/contents Accessed March 2021

[111] Her Majesty Government (UK) (2002) Landfill (England and Wales) Regulations (as amended) [Online] Available at: https://www.legislation.gov.uk/uksi/2002/1559/contents/made Accessed March 2021

[112] Her Majesty Government (UK) (2016) Environmental Permitting (England and Wales) Regulations [Online] Available at: http://www.legislation.gov.uk/uksi/2016/1154/contents Accessed arch 2021

[113] Welsh Government (2010) INTERIM ADVICE NOTE 125 /09(W) Supplementary guidance for users of DMRB Volume 11 'Environmental Assessment' [Online] Available at: https://gov.wales/sites/default/files/publications/2017-10/interim-advice-note-12509w-supplementary-guidance-for-users-of-design-manual-for-roads-and-bridges-dmrb-volume-11-environmental-assessment.pdf Accessed March 2021

[114] Highways England (2019) DMRB Volume 11 Section 3 Part 13 LA 110 Sustainability and environment. Appraisal. Material assets and waste (formerly IAN 153/11) [Online] Available at: https://www.standardsforhighways.co.uk/dmrb/search/6a19a7d4-2596-490d-b17b-4c9e570339e9 Accessed March 2021

[115] Welsh Government (2004) Minerals technical advice note (MTAN) Wales 1: aggregates [Online] Available at: https://gov.wales/minerals-technical-advice-note-mtan-wales-1-aggregates Accessed March 2021

[116] Welsh Government (2017) Technical advice note (TAN) 21: waste [Online] Available at: https://gov.wales/technical-advice-note-tan-21-waste Accessed March 2021

- Construction Code of Practice for the Sustainable Use of Soils on Construction Sites [117]; and
- CL:AIRE Definition of Waste: Development Industry Code of Practice[118].

14.6 Potential effects

14.6.1 Use of materials

The Scheme is likely to require large quantities of material resources for the construction of the coastal defence and associated structures. This would, therefore, have permanent direct adverse effects on the environment, specifically through the depletion of non-renewable resources, and the subsequent impact on the national demand for materials. Specific quantities of materials have not been quantified at this stage, however the types of material resources likely to be required, for the construction of the Scheme, are as follows:

- Sand;
- Concrete;
- Cement;
- Aggregate; and
- Bitumen.

Materials required for the operation and maintenance of the Scheme mostly include aggregates and other materials for coastal defence repairs and other maintenance activities.

Judgement of aspects scoped in or out is taken from the baseline information and the understanding of the known and estimated demand for materials resources. Table 14.10 describes the potential effects of the use of materials from this Scheme during construction and operation It summarises which aspects of the Scheme would be scoped in for a subsequent ES.

Table 14.10: Potential effects on materials

Effects	Construction	Operation
Potential Not-Significant Effects	None identified.	The receptors likely to be subject to impacts as a result of the use of material resources include quarries and other sources of minerals, and other finite raw material resources. Beach maintenance (e.g. reprofiling, excluding recharge) is anticipated to have a minimal materials demand.
Potential Significant Effects	The receptors likely to be subject to impacts as a result of the use of material resources include quarries and other sources of minerals, and other finite raw material resources. The potential impacts associated with the use of material resources on these receptors include: • The depletion of non-renewable resources; and	Maintenance activities associated with beach recharge would be infrequent with associated materials volumes expected to be in small quantities. However given the lack of data on frequency and quantities the beach recharge of maintenance activities has been scoped in until more information becomes available.

[117] Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites [Online] Available at: https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites Accessed March 2021

[118] CL:AIRE (2011) Definition of waste: Development Industry Code of practice CoP Main Document [Online] Available at: https://www.claire.co.uk/projects-and-initiatives/dow-cop/28-framework-and-guidance/111-dow-cop-main-document Accessed March 2021

Effects	Construction	Operation
	• The impact on the national demand for materials. The Scheme is likely to require large quantities of material resources for the construction of the coastal defence and associated structures.	
Scoped In/Out	**Scoped In**	**Scoped In***

Source: Mott MacDonald Ltd, 2021

*Potential to be scoped out as further information on beach maintenance recharge becomes available.

It is likely that any significant effects due to the quantity of material resources required could be appropriately mitigated through the implementation of mitigation measures such as the outcomes of the D4RE workshop to identify measures to minimise the requirement for imported materials and reuse wastes generated.

However, without accurate material quantification at this stage, this assumption cannot be confirmed. Where possible, recycled aggregates would be used within the Scheme and utilise locally derived material resources, for example sand along the coast where permitted.

14.6.2 Generation and management of waste

Waste would predominantly arise from excavations of hard surfaces and sand, and from materials brought to site, not used for their intended purposes, damaged items, cut offs and surplus materials. Some types of waste, generated from construction projects, may be harmful to human health, or to the environment, either immediately or over an extended period of time (defined as hazardous wastes). However, these are not anticipated to be generated from the Scheme, the majority of wastes would be non-hazardous.

Exact quantities of waste likely to be generated by the construction of the Scheme have not been quantified at this stage. However, waste may result from the following:

- Surplus excavated materials (soils or substrata);
- Waste from the demolition of existing structures; and
- Surplus construction materials (e.g. concrete, aggregates, asphalt).

During the operation of the Scheme waste would be likely to arise from the following activities:

- Promenade/beach access cleaning;
- Replacement signage and lighting;
- Hard surface repair and resurfacing; and
- Coastal defence maintenance.

Judgement of aspects scoped in or out is taken from the baseline information and an understanding of the typical wastes generated. Table 14.11 describes the potential effects of the generation of waste from the Scheme during construction and operation. It summarises which aspects of the Scheme would be scoped in for a subsequent ES.

A confirmatory scoping opinion is requested from all relevant statutory consultees.

Table 14.11: Potential effects from the generation of waste

Effects	Construction	Operation
Potential Not Significant Effects	The receptors likely to be subject to impacts as a result of waste generation and management are landfills and other	The receptors likely to be subject to impacts as a result of waste generation and management are landfills and other

Effects	Construction	Operation
	waste management infrastructure. The potential impacts assessment from the generation and management of waste arise from depletion of the remaining local landfill capacity. No significant effects are anticipated, relating to the construction of the Scheme, as waste generated would be unlikely to generate large volumes requiring treatment or disposal and would be limited to inert or non-hazardous wastes. There is an understanding that there is sufficient capacity within the existing waste infrastructure within North Wales to deal with any wastes arising from the construction of the Scheme. Mitigation measures would be put in place to adequately deal with waste that may be generated during construction.	waste management infrastructure. The potential impacts assessment from the generation and management of waste arise from depletion of the remaining local landfill capacity. No significant effects anticipated relating to the operation of the Scheme as waste generated through maintenance activities would be unlikely to generate large volumes of waste requiring treatment or disposal. There is an understanding that there is sufficient capacity within the existing waste infrastructure within North Wales to deal with any wastes arising from the operation of the Scheme.
Potential Significant Effects	None identified.	None identified.
Scoped In/Out	**Scoped Out**	**Scoped Out**

Source: Mott MacDonald Ltd, 2021

The Scheme would aim to minimise the generation of waste as much as possible, through the outcomes of the D4RE workshop, and development of a Site Waste Management Plan (SWMP). Additionally, it is assumed at this stage that any surplus materials would be suitable to be re-used either within the Scheme or elsewhere. As long as waste is managed appropriately, implementing the mitigation measures, it is unlikely that the generation and management of waste would result in significant effects.

Completion of a D4RE workshop and SWMP would minimise the requirement for imported materials and waste generation. Materials requirements and waste arisings associated with the annual maintenance regime are expected to be minimal and likely to be less than maintenance for the existing defences. By applying the waste hierarchy to C&D waste the Scheme would contribute to the Welsh target to recycle this waste at a rate increasing by at least 1.4% each year to 2050, using 2006/2007 as a baseline. In addition, the Mineral Technical Advice Note: Aggregates[119] sets objectives to encourage the production of aggregates from secondary and recycled resources including an overall target for 40% of C&D waste recycled as aggregates by 2025.

14.7 Additional information and assessments/reporting required in support of the ES

The following would be required:

- Further assessment is required of the use of materials during construction:
  - Accurate material quantification;
  - Further design information; and
  - Scheme schedule and the availability of and access to material from quarries and other such sources of material throughout the phases of construction.

[119] Welsh Government (2004) Minerals technical advice note (MTAN) Wales 1: aggregates [Online] Available at https://gov.wales/minerals-technical-advice-note-mtan-wales-1-aggregates Accessed March 2021

- A SWMP:
  - To be produced prior to the commencement of construction;
  - Detail how waste would be managed and disposed of during the construction of the Scheme;
  - Define the use of the waste hierarchy to manage waste and implementing mitigation measures to minimise and reduce the amount of waste needing treatment and disposal; and
  - Taking account of any changes in design as the project progresses.

14.8 Proposed methodology

The proposed EIA methodology for the assessment of Materials effects can be found in Appendix C.7.

15 Noise and Vibration

15.1 Introduction

This Chapter sets out the proposed scope for the assessment of the potential noise and vibration impacts and associated effects of the Scheme on nearby noise and vibration sensitive receptors (NSRs). This analysis aims to gain an understanding of the need to undertake further assessment should any of the following apply:

- Does construction or operational noise and vibration generated by the project have the potential to generate adverse effects at any noise and vibration sensitive receptors?
- Are there any receptors where there would be a reasonable stakeholder expectation that a construction or operational noise and vibration assessment would be undertaken?

The description of the baseline utilises desk study information only, no quantitative testing or monitoring has been undertaken to inform it.

15.2 Study Area

The construction study area predominantly focuses on the closest sensitive receptors within 50m of the Scheme, however consideration would be given to receptors up to 300m from the Scheme that could be affected by traffic generated at the construction stage. This approach is consistent with BS 5228[120] guidance for the prediction and assessment of potential construction noise and vibration impacts.

At present the final Transport Report for the Scheme is not available, however, a review of the currently proposed traffic design, which includes the preferred option of re-routing traffic flows in the Cayley Promenade area, would mean an operational traffic noise assessment may be required.

The final study area for operational road noise is dependent on the final traffic and transport design and data. Using guidance provided by The Design Manual for Roads and Bridges[121] (DMRB), LA111, affected routes in the vicinity of the Scheme where a noise change of greater than 1dB is predicted would be identified and would aid in informing the final operational noise study area.

15.3 Baseline conditions

15.3.1 Potential sensitive receptors

he Scheme is bordered on the western side by the Western Promenade and running parallel to it, Cayley Promenade, upon which are residential properties and noise sensitive receptors with a residential element such as hotels and guest houses. The residences located on Cayley Promenade, are located immediately adjacent to the Scheme RLB (25-45m distant from the main promenade works). Cayley Promenade is set above the Western Promenade, the southern end of the road being substantially more elevated than the northern. The local topography would mean that some houses would have direct line of sight over some aspects of the project but may be afforded some shielding from the works as a result of the embankment also.

[120] British Standards Institution (BSI) (2014). BS 5228-1&2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise & Part 2: Vibration.

[121] Highways England, (2020) Design Manual for Roads and Bridges, LA111 Noise and vibration revision 2

15.3.2 Existing noise sources

The A55 Expressway is a busy dual carriageway that runs to the south of the Scheme approximately 250m from the southern extent of the Scheme at its closest point. The speed limit along this section of the A55 is 50mph.

The NWC Railway line which runs through Colwyn Bay is the main link between Holyhead and Crewe. The NWC Railway runs parallel to the A55 on the eastern side and would be a secondary contributor to the ambient noise levels

Additional noise sources include local traffic movements on the Western Promenade and Cayley Promenade.

15.3.3 Baseline noise levels

At the time of this scoping exercise, the effects of Covid-19 are considered to have resulted in atypical ambient and background noise levels in surrounding areas to the Scheme due to changes in usage of primary modes of transport in addition to changes in commercial, residential and leisure activities. Baseline noise levels for the Scheme have not been measured, however a desktop study has been undertaken to review the baseline noise environment at relevant sensitive receptors.

Strategic noise maps of Wales[122] indicate that noise from the A55 Expressway does not significantly contribute to ambient noise levels at receptors adjacent to the Scheme. Noise levels are shown to be less than 55dB $L_{Aeq,16hr}$ for receptors within 150m of the Scheme. No noise levels are available for the NWCL Railway.

Road traffic from minor and local roads (not included within noise mapping) would however contribute to existing noise levels at relevant receptors.

Strategic noise mapping also identifies a single noise Priority Area within Colwyn Bay located on the A55 Expressway (ID: 424). This Priority Area is not within 250m of the Scheme extents but is located on the A55, approximately 65m from the B5115 overbridge in the west and extends to the start of the slip road for Junction 20 in the east.

Where practical it is recommended that baseline surveys are undertaken at representative NSRs on Cayley Promenade, to establish the baseline pre-construction noise levels for consideration within the construction noise assessment. The surveys should be undertaken for a suitable duration representative of periods when construction would be undertaken at the nearest NSR during representative noise conditions (i.e. outside of school/public holidays).

The baseline noise levels for the operational aspect of the study would be determined using acoustic modelling. Existing noise sources, road and rail would be incorporated, with data for road flows (main and local) being provided by the traffic engineers.

At the time of this scoping exercise, due to uncertainty over the implications of any future changes in ambient noise levels due to effects of Covid-19, it is recommended that agreement with CCBC is sought, to confirm the methodology proposed to establish baseline noise levels. Where it is not practical to undertake measurements, a desktop assessment based on a study of mapping for the area, aerial imagery, available noise mapping, acoustic survey data from other previously approved developments in the area (if any applicable are found) and professional judgement could be used to inform baseline noise levels which are considered to be representative of conditions prior to effects of Covid-19 measures. These levels can be used to assign threshold noise levels for construction noise, pursuant to BS 5228-1 guidance (ABC

[122] Extrium Ltd (2019) Wales Noise and Air Quality Viewer [Online] Available at: http://extrium.co.uk/walesnoiseviewer.html Accessed March 2021

category) for use in the assessment of determining significant effect of construction noise at NSRs

15.4 Assumptions and limitations

- Due to the effect of Covid-19, representative baseline noise levels would be measured or selected and agreed with CCBC at the time of EIA;
- A detailed construction method statement is not currently available. It is assumed construction traffic to the site from A55 Expressway would avoid routes that take them through the designated Priority Area; and
- Traffic movements and traffic management measures required during the construction and operational phases are currently unknown. Based on the current road traffic designs, traffic volumes and travel patterns may have the potential to change upon completion of the works.

15.5 Key guidance and best practice

Key legislation, policy and guidance relevant to noise and vibration in Wales include:

- The Environmental Noise (Wales) (Amendment) Regulations 2018[123];
- Land Compensation Act 1973[124];
- Noise Insulation Regulations 1975 (as amended 1988)[125];
- Well-being of Future Generations (Wales) Act 2015[126];
- Control of Pollution Act 1974[127];
- Planning Policy Wales, 2021[128];
- TAN 11 (Noise), 1997[129];
- BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise';
- BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration';
- BS 7385-2:1993' Evaluation and Measurement for Vibration in Buildings. Guide to Damage Levels from Ground-borne Vibration'[130];
- ANSI, (2014) Sound exposure guidelines for fishes and sea turtles[131];
- NOAA, (2018) Technical Memorandum NMFS-OPR-55, 2018[132];
- Highways England, (2020) Design Manual for Roads and Bridges, LA111 Noise and vibration, revision 2; and
- Conwy County Borough Council, (2013) Conwy Local Development Plan 2007-2022.

[123] Environmental Protection Wales, (2018) The Environmental Noise (Wales) (Amendment) Regulations 2018. Statutory Instrument 2018 No.1208 (W.245).

[124] Crown, (1973) Land Compensation Act 1973 (ch. 26).

[125] Crown, (1988) The Noise Insulation (Amendment) Regulations 1988. Statutory Instrument 1988 No.2000.

[126] Future Generations Commissioner for Wales, (2015) Well-being of Future Generations (Wales) Act 2015.

[127] Crown, (1974) Control of Pollution Act 1974. (ch. 40).

[128] Welsh Government, (2021). Planning Policy Wales - Edition 11.

[129] Welsh Government, (1997). Planning Policy Wales Technical Advice Note (TAN) 11: Noise.

[130] British Standards Institution (BSI) (1993). BS7385-2:1993 Evaluation and Measurement for Vibration in Buildings. Guide to Damage Levels from Ground-borne Vibration.

[131] American National Standards Institute (2014) ASA S3/SC1.4-2014 Sound exposure guidelines for fishes and sea turtles.

[132] NOAA, (2018) Technical Memorandum NMFS-OPR-55, 2018 revision to technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing, National Oceanic and Atmospheric Administration, US Department of Commerce, National Marine Fisheries Service, 2018

15.6 Potential effects

15.6.1 Construction noise

There are potential adverse effects from noise impacts arising from the construction of the Scheme including, promenade reconfiguration and remodelling; (including but not limited to creation of seating and play areas, cycle path, kiosk construction, access routes and ramps); other works include sea wall improvements, beach replenishment activities, road modifications, erection and use of site compounds and noise from construction traffic.

Should high noise level construction activities occur for extended durations during the construction phase, (e.g. surface breaking, surface flattening etc.), this could cause a significant adverse effect at nearby noise sensitive receptors if left unmitigated. Construction noise and vibration impacts would be mitigated by the implementation of Best Practicable Means as defined in Section 72 of the Control of Pollution Act 1974. These measures would include selection of the most appropriate construction techniques and limiting working hours of relevant high noise level activities.

Increases in road traffic noise due to construction vehicles and associated traffic to and from the site has the potential to result in adverse noise impacts at noise sensitive receptors. This is dependent on the number of people needed to carry out the works and the number of construction related deliveries required coupled with the types of vehicles employed to make the deliveries. Any road diversions employed would have the potential to change the road flows in the local area, temporarily having the potential to have adverse effects on noise sensitive receptors near the Scheme.

There are potential adverse effects on marine mammals due to construction noise, particularly from proposed beach replenishment works (running 24 hours a day), which involve offshore based activities and delivery systems. The extent of this is subject to multiple factors including construction methodology. An underwater noise assessment would be undertaken to determine the extent of potential effects.

There are potential noise impacts on birds on the Liverpool Bay/Bae Lerpwl SPA primarily anticipated to be related to noise from the replenishment activities. Potential effects are dependent on multiple factors including location of the works with respect to sensitive species, construction methodology and character of noise generated, timing of the works, etc. Construction noise impacts on birds has therefore been scoped in for assessment subject to review of a detailed construction methodology.

15.6.2 Construction vibration

The assessment of the potential impacts of vibration from construction is generally limited to sensitive and occupied properties at which perceptible vibration is predicted and any building where vibration may affect its structural integrity. Vibration from construction activities has the potential to generate adverse effects at vibration sensitive receptors at the northern end of Cayley Road, where residences are within 25m of the Scheme main construction area on West Promenade and is therefore scoped into the proposed EIA.

15.6.3 Operational noise

As detailed in Chapter 17, increased travel demand to the area could result in an increase in motorised traffic, but this is considered unlikely, as the additional demand would be off-set by improvements to active travel routes and increased access by walking and cycling.

The current preferred option with regards to traffic proposals include the introduction of junction modifications, signals and route priority changes and are anticipated to have the potential to

alter existing travel patterns throughout the associated residential streets in the area between Cayley Promenade and the B5115. Based on the current traffic proposal; (which introduces a one-way system along the Western Promenade), traffic volumes on Cayley Promenade would change significantly from being local residential access traffic, to being the exit route for traffic using the Western Promenade. This has the potential for effects on the residences on Cayley Promenade, requiring an operational noise traffic assessment to be scoped into the EIA.

15.6.4 Operational vibration

No operational vibration is anticipated as a result of the Scheme, it is therefore scoped out of the EIA.

15.6.5 Potential effects summary

Table 15.1 summarises that in conclusion it is recommended that a quantitative assessment for construction noise and vibration is scoped in, inclusive of potential effects on fauna. Based on current traffic designs operational traffic noise is scoped in. No operational vibration is anticipated and is scoped out.

Table 15.1: Potential effects

Effects	Construction	Operation
Potential Non-Significant Effects	Construction traffic could cause temporary adverse effects at NSRs.	N/A
Potential Significant Effects	Construction activities may produce significant adverse noise and vibration effects at sensitive receptors depending on several factors including the methodology, time of operation and duration of works. The CNMP and CEMP would be produced to minimise adverse noise and vibration effects. Offshore construction (including potential for tidal working), could cause temporary adverse impacts for marine mammals and fish. Construction activities (land and water based) could cause temporary adverse impacts on birds. Significant noise and vibration effects in relation to the use of Traeth Pensarn above mean high water as a potential pipeline construction area are not currently anticipated, however given the lack of data at this time as to whether this area would be used or not, it has been scoped in for further consideration at the ES stage.	Potential for operational noise due to traffic route changes and signal modifications.* Also relating to operational beach maintenance and small scale replenishment activities.
Scoped In/Out	**Scoped In (construction noise)** **Scoped In (construction vibration)** **Scoped In (underwater noise impact on fish and mammals)**	**Scoped Out (operational vibration)** **Scoped In (operational noise)***

*Should operational traffic flows not be altered in the Cayley Promenade and West Promenade area (maintenance of two-way traffic flows along West Promenade), then operational noise effects would be likely to be scoped out

Construction noise and vibration has been scoped in at the current time, however a scoping opinion for this discipline is requested from any statutory consultees.

15.7 Additional information and assessments/reporting required in support of the ES

To inform the ES Chapter the following information would be required:

- Transport Report;
- Baseline noise survey data to inform the construction assessment (subject to noted assumptions and limitations due to any ongoing Covid-19 measures);
- Confirmation of likely plant inventories, working areas and usage;
- Location and operation of construction compounds;
- Construction programme;
- Construction traffic data and details of selected routes; and
- Confirmation of the location of the pipeline assembly;

15.8 Proposed methodology

The proposed EIA methodology for the assessment of Noise and Vibration effects can be found in Appendix C.8.

16 Population and Health

16.1 Introduction

This Chapter sets out the proposed scope for the assessment of the potential effects of the Scheme on population and human health. An overview of the population and health baseline within the study area and details of the likely significant population and human health effects are provided. The proposed methodology for assessing the impact of the Scheme on population and health is set out, identifying those effects which can be scoped out of the EIA.

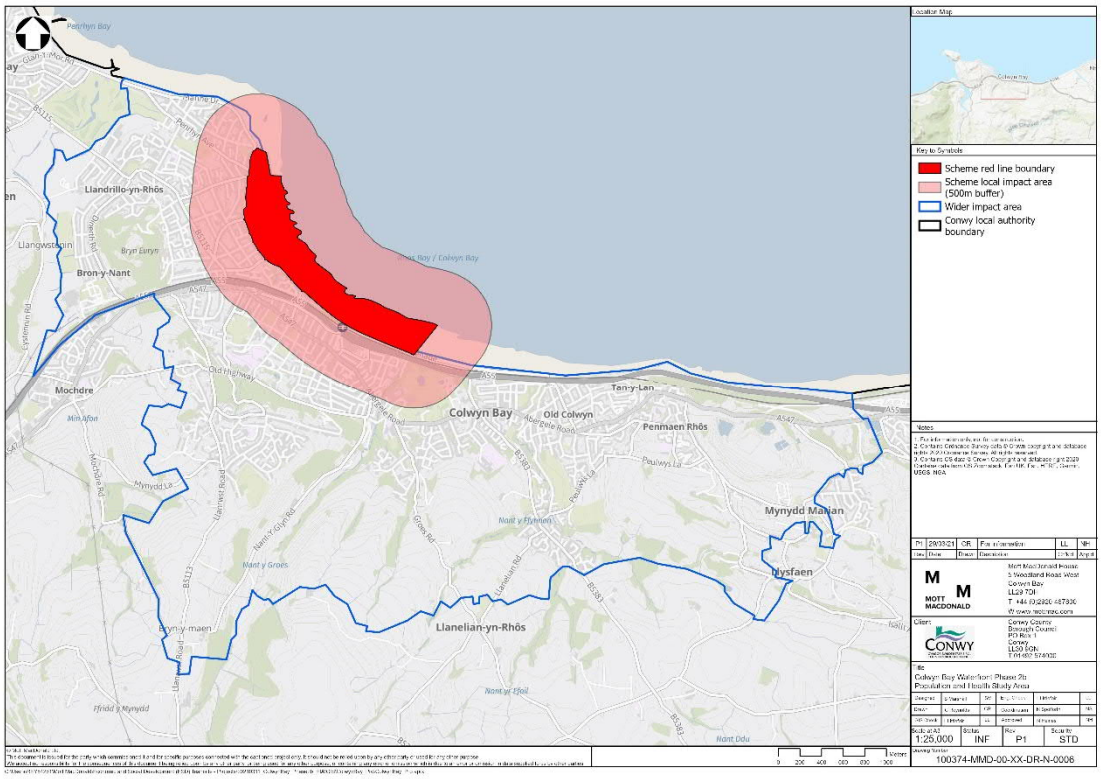
16.2 Study Area

Baseline data has been calculated for a Local Impact Area (LIA) and Wider Impact Area (WIA). The LIA and WIA have been created based on guidance and professional judgement and are defined as follows:

- LIA – The area located within 500m of the Scheme would be referred to as the LIA. This is the primary study area for this discipline and is designed to capture most potential population and human health effects of the Scheme. This is shown on (Figure 16.1) and comprises the western part of the Colwyn Bay Waterfront and much of the Rhôs-on-Sea neighbourhood; and
- WIA – The town of Colwyn Bay would be referred to as the WIA. This is also shown on Figure 16.1. This area would be used to assess potential active travel and tourism effects as impacts would be on receptors which are greater than 500m from the Scheme.

Note: The RLB for the Scheme has not yet been finalised. The boundary used is an indicative conservative boundary including all potential areas for access, construction compounds and working areas. It therefore represents a worst-case scenario.

Figure 16.1: Map of the study area showing the LIA and WIA



Source: Mott MacDonald Ltd, 2021

16.3 Baseline conditions

16.3.1 Population

Colwyn Bay is a seaside town in Conwy County Borough on the North Wales coast. The main settlements are Rhôs-on-Sea to the west, which is the closest to the Scheme, the town of Colwyn Bay in the centre and Old Colwyn to the east. The A55 Expressway passes through the town, running parallel to the North Wales Coast (NWC) Railway Line, both of which separate most of the Colwyn Bay town from the waterfront. Table 16.1 shows the population and age structure of the LIA, WIA, CCBC and Wales.

Table 16.1: Population baseline data

Area	Total population	Under 16	Age 16-64	65+
LIA	6,905	15%	52%	33%
WIA	26,833	17%	55%	27%
CCBC	117,203	16%	56%	28%
Wales	3,152,879	18%	61%	21%

Source: ONS Population Estimates 2019 mid-year

The proportion of children (those under 16) in the LIA (15%) is broadly consistent with the proportion in the WIA (17%), CCBC (16%), but slightly lower than the proportion in Wales (18%). The proportion of people aged 65 and older in the LIA (33%) is higher than the proportion in WIA (27%) and CCBC (28%) and considerably higher than the proportion in Wales (21%), as there are 23 care homes within the LIA.

16.3.2 Deprivation

The Welsh Index of Multiple Deprivation (WIMD) is used for the measurement and comparison of relative levels of deprivation. Table 16.2 shows the income deprivation quintiles across the LIA, WIA and Wales.

Table 16.2: Population by deprivation quintiles

Location	Most deprived	Second most deprived	Third most deprived	Fourth most deprived	Least deprived
LIA	45%	10%	0%	25%	19%
WIA	22%	18%	5%	28%	27%
CCBC	12%	22%	18%	24%	25%
Wales	20%	20%	20%	20%	20%

Source: Welsh Indices of Multiple Deprivation, 2019

The majority of the residents in the LIA live in the two most deprived quintiles, either the most deprived (45%) or the second most deprived (10%) neighbourhoods in the country. The percentage of LIA population living within the most deprived quintile (45%) is more than double than the percentages in the WIA and Wales (22% and 20% respectively) and nearly four times higher than the percentage living in the most deprived neighbourhoods in the County. The proportion of people living in the two least deprived quintiles is lower than for the WIA and County, but higher than Wales. The population in the LIA is therefore more deprived in comparison to the WIA, CCBC and Wales populations, split between the two most deprived (55%) and the two least deprived (44%) neighbourhoods in the country.

16.3.3 Employment and economic activity

Table 16.3 shows the economic activity for the working age population (16-64) for each of the study areas.

Table 16.3: Economic activity baseline data

Area	Economically Active (16-64)	Economically Inactive
LIA	52%	48%
WIA	55%	44%
CCBC	56%	44%
Wales	61%	39%

Source: ONS Population Estimates 2019 mid-year

The proportion of working age individuals aged 16-64 in the LIA (52%) is lower than the WIA (55%), CCBC (56%) and Wales (61%). The proportion of people economically inactive in the WIA (48%) is higher than the WIA (44%), CCBC (44%) and Wales statistics (39%). There are less people economically active in the LIA compared to the three other areas.

The Office for National Statistics provides data on employment estimates by industry.[133] The largest industries of employment in the WIA are ‘business administration and support services’, 'health’, ‘retail’, ‘accommodation and food services’ and professional, scientific and technical’ (30%, 15%, 10%, 10% and 8% respectively). The proportion of employees within the health sector is 15% which is in line with the CCBC and Wales proportion as there are a number of health care facilities and General Practitioner clinics within the WIA.

[133] Office for National Statistics, Business Register and Employment Survey, 2020

16.3.4 Businesses

There are several businesses located within the RLB, predominantly near its eastern boundary, within Porth Eirias, and accessible from the promenade and beach. These include water sports providers, shops, a fast-food outlet, an office and a restaurant. A number of businesses are within the LIA, located predominantly in Colwyn Bay, to the south of the A55 Expressway and Rhôs-on-Sea, between Rhôs Promenade, B511 and Penrhyn Avenue.

16.3.5 Tourism

In 2018 tourism generated around £887 million to the CCBC economy.[134] Conwy County is well located as a base for tourists to explore North Wales, as well as Ireland.

Tourism is an important part of the Conwy economy, supporting 12,208 full-time equivalent jobs directly or indirectly, and supporting 70,000 bed spaces (24% of North Wales stock). As such, it is one of the mainstays of Conwy's economy and is a major source of employment and revenue.[135]

Colwyn Bay's long promenade, ease of access to blue-flag beaches and nearby harbours attracts tourists, particularly in the summer months. The area has been a popular seaside destination since Victorian times.

16.3.6 Health

Table 16.4 presents key health indicators within CCBC and Wales[136]. CCBC generally performs consistent to the national statistics in relation to public health indicators. Physical activity levels in CCBC (61%) are higher than the national average (53%).

Table 16.4: Public health baseline data

Measure	CCBC	Wales
Long-term health problem or disability (2011) (%)	24%	23%
Life expectancy at birth (male 2015-17) (years)	79	78
Life expectancy at birth (female 2015-17) (years)	83	82
Under-75 mortality rate, cardiovascular diseases (per 100,000, 2016-18)	79	85
Physically active adults (% 2017/18)	61%	53%

Source: NHS Wales, Public Health Indicators (2011-2019)

16.3.7 Residential properties

The nearest residential properties to the Scheme are located immediately adjacent in Rhôs-on-Sea. The Scheme is bounded to the west, adjacent to the RLB, by a large number of residential and commercial properties including multi-storey apartment blocks which offer elevated views across the Phase 2b area. Approximately half of the residential properties are located to the south of the A55 Expressway and NWC Railway Line which provide a buffer between the properties and the Scheme.

[134] Conwy Borough Council (2019) Destination Conwy Management Plan. Available here: http://www.conwy.gov.uk/en/Council/Strategies-Plans-and-Policies/Destination-Conwy

[135] Conwy Borough Councli, Replacement Local Development Plan (LDP) 2018-2033 Topic Paper 04:Tourism (September 2018). Available at: http://www.conwy.gov.uk/en/Resident/Planning-Building-Control-and-Conservation/Replacement-LDP/Stage-4-Development-of-Evidence-Base/assets/documents-Tourism/Topic-Paper-4-Tourism.pdf

[136] Data is not available at a small area level.

16.3.8 Community resources

There are multiple community resources located within the LIA. Amongst these are a number of care homes (23), churches and places of worship (15), community halls/facilities (12), dentists (9), schools (5) and children's nurseries (2). There is a public park, Eirias Park, at the eastern extremity of the LIA, and a number of sporting facilities (15) throughout the LIA. The only community resource within the RLB is Porth Eirias Watersports Centre on the Promenade, at the eastern extremity of the RLB. As with the residential properties, A55 Expressway and NWC Railway Line which provide a buffer between the community resources and the Scheme for almost half of the populated area of the LIA.

16.3.9 Open space and recreation including Active Travel Routes

National Cycle Route 5 passes through the LIA from the east and along the Promenade in Colwyn Bay and Rhôs-on-Sea . This is a main cycle route in CCBC. There are Public Rights of Way (PRoW) in the LIA which provide pedestrians and cyclists access around Colwyn Bay town. Two PRoWs (Bridleway 52 and Footpath 11) and a traffic-free cycle route (not on the National Cycle Network) provide access to the promenade beneath the A55 Expressway and NWC Railway Line, joining the promenade just at the eastern Scheme boundary.

Beach access is currently provided through slipways and steps (generally in very poor condition) located at regular intervals.

The second closest community resource to the Scheme is Rhôs Paddling Pool Play Area, on Marine Drive.

Eirias Park, which includes amenities such as tennis courts, play areas, sports fields, a skate park and an indoor leisure centre, is located within the LIA.

16.3.10 Development land

The Conwy LDP[137] shows the location and extent of allocated developments in Colwyn Bay. Within the LIA there is one site allocated for housing on Lawson Road which is to the south of the Scheme and west of Eirias Park. The 'Shopping Zone' is also within the LIA, located along Abergele Road, separated from the southern boundary of the Scheme by A 55 Expressway.

16.4 Assumptions and limitations

- Information presented within this assessment is from between 2011 and 2019 and therefore does not reflect any changes to the economy, employment and health associated with the Covid-19 pandemic in 2020. As comparable information becomes available for the 2020 period, the baseline would be updated;
- The assessment of the potential for significant effects has been carried out against a benchmark of current baseline conditions within the LIA and WIA. As with any dataset, these may be subject to change over time, which may influence the findings of the assessment and could lead to the assessment being subject to statistical time lag;
- No formal consultation or primary research has been undertaken in the production of this Chapter;
- It is assumed that the construction process would not render local properties unusable and there would be no displacement of local residents; and

[137] Conwy Local Development Plan 2007- 2022 Proposals Map [online] Available at: http://conwy.opus3.co.uk/ldf/maps/Adopted%20LDP#x=287267.96421247&y=378610.80546075&scale=10000&1266&1199&1197&1198&1201&1202&1203&1200&1204&1210&1208&1206&1205&1207&1209&1211&1275&1212&1213&1214&1215&1268&1267&1269&1270&1271&1216&1217&1218&1219&1234&1241&1230&1231&1232&1222&1221&1220&1223&1224&1225&2225&1229&1228&1227&1242

- It is assumed that the construction compounds would require temporary land take, but the land would be reinstated ready for future uses.

16.5 Key guidance and best practice

The population and human health assessment is guided by the EIA Regulations[138] as well as national and local planning policy including:

- Countryside Rights of Way Act, 2000;[139]
- Well Being of Future Generations (Wales) Act (2015)[140];
- Planning Policy Wales 2021;[141]
- TAN 16: Sport, Recreation and Open Space;
- TAN 20: Planning and the Welsh Language; and
- TAN 23: Economic Development.

The assessment is also guided by Public Health Wales' 'Health Impact Assessment: A practical guide' which outlines human health assessment methods for Wales[142]. This is considered the most up-to-date and relevant piece of guidance for human health assessments within Wales. However, professional judgement is also used to guide the assessment, particularly in relation to population impacts.

16.6 Potential effects

Table 16.5 summarises the anticipated potential effects arising from construction and operation of the Scheme.

A confirmatory scoping opinion is requested from all relevant statutory consultees.

Table 16.5: Potential effects

Effects	Construction	Operation
Potential Insignificant Effects	There is not expected to be any permanent loss of residential or commercial land or property as a result of the construction of the Scheme. The only temporary loss of land is associated with the construction compounds and working areas, which would be situated between the Promenade and the sea, on the beach. Effects are likely to be not significant as land would be returned to its former use after the construction period. There may be temporary disruption to access for the properties located in close proximity to the Scheme, with access from Cayley Promenade and Rhôs Promenade. However, these effects would be temporary, and access would be	Effects on community receptors are not likely to be significant as the operation of the Scheme would not impact the ability for people to access and use community resources within the LIA. The potential effect on development land from operation of the Scheme is not likely to be significant, as the Scheme is separated from the allocated site by the A55 Expressway. The operation of the Scheme would therefore not impact on the ability for this site to be developed.

[138] Her Majesty Government (UK) The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations (2017) [Online] Available at: The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (legislation.gov.uk)

[139] Her Majesty Government (UK) Countryside and Rights of Way Act (2000) [Online] Available at: Countryside and Rights of Way Act 2000 (legislation.gov.uk)

[140] Her Majesty Government (UK) Well-being of Future Generations (Wales) Act (2015) [Online] Available at: https://www.legislation.gov.uk/anaw/2015/2/contents/enacted

[141] Welsh Government (2021) Planning Policy Wales, Edition 11 [Online] Available at: https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf

[142] Public Health Wales (undated), 'Health Impact Assessment: A practical guide' [Online] Available at: https://whiasu.publichealthnetwork.cymru/files/1415/0710/5107/HIA_Tool_Kit_V2_WEB.pdf

Effects	Construction	Operation
	maintained to all affected properties. The effects on residents, in relation to access to their properties, are not likely to be significant. Access to the beach is likely to be temporarily impacted as a result of construction with some access points being required to be temporarily closed. However, as there are multiple access points, residents and visitors would still be able to access other beach areas and as such these effects on recreational receptors are not likely to be significant. Effects on access to community resources are likely to be not significant, as only one sporting facility is located within the RLB, close to proposed construction works. The potential effects on development land are not likely to be significant as the Scheme is separated from the allocated site by the A55 Expressway, which is unlikely to be closed during the construction of the Scheme. The construction of the Scheme would therefore not impact on the ability for this site to be developed for housing provisions.	
Potential Significant Effects	There are a number of businesses within the LIA, which could be impacted due to changes to access, and other environmental impacts such as noise and air quality, during construction of the Scheme. This has the potential to disrupt local business activity, particularly footfall, which has the potential to be significant. Those businesses located in Rhôs-on-Sea between B5116, Rhôs Promenade and Penrhyn Avenue are most likely to be affected. There are anticipated to be positive effects on the local economy and employment in relation to job creation, the supply chain, and employment opportunities during construction of the Scheme. There may be temporary disruption for cyclists and pedestrians in the LIA. This would temporarily impact on people's use and enjoyment of the national cycling trail and the Promenade, which is part of the Wales Coast Path. One of the main tourist attractions in Colwyn Bay is the beach. The construction area would be predominantly on Colwyn Bay beach and Rhôs-on-Sea beach. As the construction could result in the closure of a large areas of Colwyn Bay beach and Rhôs-on-Sea beach to the public, this could impact upon the ability of the residents to use and enjoy the beach area. Also, the construction works could deter tourists from wanting to visit the area.	The Scheme is proposed to provide renewed coastal defences along the waterfront to protect the residents and businesses of the town from the threat of flooding from the sea; and provide environmental improvements to the promenade to offer a modern, robust, sustainable and attractive public realm to draw new visitors to the area. Improved coastal protection as a result of operation of the Scheme would safeguard existing businesses and may attract new businesses to the promenade and increase opportunities for employment, contributing to the wider regeneration of Colwyn Bay. There are likely to be benefits for NMUs, due to improvements to the promenade. The detailed design of the Scheme and therefore the extent of these potential improvements have not yet been finalised. There may be benefits to health as a result of improvements to NMU facilities from the Scheme, increasing people's use and enjoyment of the national cycling trail and the promenade, which is part of the Wales Coast Path. Improved access to the beach is likely to have a beneficial effect on recreational opportunities for residents in Colwyn Bay and Rhôs-on-Sea . There is the potential for beneficial effects on tourism as a result of the Scheme as the enhanced protection makes the

Effects	Construction	Operation
	Therefore, impacts on tourism have the potential to be significant. Construction of the Scheme could potentially have human health effects and reduce amenity for nearby residents during construction through environmental impacts such as noise, air quality and night lighting impacts. Therefore, combined effects on residents from a temporary reduction in amenity, and human health effects have the potential to be significant. Significant population and health effects in relation to the use of Traeth Pensarn above mean high water as a pipeline construction area are not currently anticipated, however given the lack of data at this time as to whether this area would be used or not, it has been scoped in for further consideration at the ES stage.	promenade more attractive for cyclists and pedestrians. Operation of the Scheme could potentially have human health effects for nearby residents through environmental impacts such as noise, air quality and night lighting if the one-way traffic system would be implemented. Therefore, there is the potential for in-combination effects to be significant.
Scoped In/Out	**Scoped In**	**Scoped In**

Source: Mott MacDonald Ltd, 2021

Population and human health effects are scoped in for both construction and operation of the Scheme.

Potential additional mitigation measures include:

- Working with local businesses along the promenade to mitigate potential adverse construction effects. Potential mitigation could include understanding access requirements to maintain footfall and undertaking construction during months when patronage is reduced. This may enable businesses to stay open during the construction period;
- Configuration of alternative cycling and pedestrian routes to minimise disruption to both visitors and local population during construction; and
- Implementation of best practice construction management procedures to mitigate air quality, noise and traffic effects.

16.7 Additional information and assessments/reporting required in support of the ES

- Outline CEMP; and
- Air quality, noise and traffic EIA Chapter review, to determine human health effects.

16.8 Proposed methodology

The proposed EIA methodology for the assessment of Population and Health effects can be found in C.9.

17 Traffic, Transport and Access

17.1 Introduction

This Chapter sets out the proposed scope for the assessment of the potential effects of the Scheme on traffic, transport and access. The ES Chapter would be supported by a Transport Statement (TS) or a Transport Assessment (TA) depending upon the findings of the scoping for these documents with CCBC. For simplicity, the rest of this chapter will refer to these documents as the Transport Report (TR).

17.2 Study Area

The study area would be defined in the TR and would consider the likely impact of the construction traffic upon the road network. IEMA guidance recommends the following when considering the impact of traffic on a highway:

- Highway links where traffic flows would increase by more than 30% (or the number of heavy goods vehicles would increase by more than 30%); and
- Any other specifically sensitive areas where total traffic flows would increase by 10% or more.

The exact study area and scope of the TR would be agreed with the Local Highway Authority, when construction routes and traffic management proposals are known in more detail.

17.3 Transport Report (TR) scoping

To confirm the methodology and scope of the TR, a scoping assessment would be undertaken with CCBC. This would detail: the availability of transport data; the requirement for junction assessments; and descriptions of the proposed development scenarios.

17.4 Baseline conditions

17.4.1 Existing infrastructure and access

Within the baseline chapter of the TR, the following information would be provided:

- Access to the site from the strategic road network;
- Access to the site from the local road network;
- Characteristics of the local road network, including: road closures; one ways; waiting restrictions; on-street parking; off-street parking; weight limits; and junction types;
- Existing traffic flows and vehicle composition (if available). Daily and seasonal variations (if available);
- Bus routes, frequencies and stops;
- Nearest rail station and services;
- Public rights of way, long distance footpaths, and pedestrian desire lines;
- Cycle routes through the site;
- Road injury accidents in the vicinity of the study area; and
- The operation and existing characteristics of the promenade and adjacent streets within the study area.

17.5 Proposed development

At the time of preparing this EIA scoping chapter, the final transport and access details of the proposed development are still under consideration. The fixed element of the development is to provide significant improvements to the space allocated for active travel (walking and cycling).

Options are still being considered for how vehicles move through the study area, with the preferred option currently being making West Promenade one-way between the extents of Cayley Promenade. This would maximise car parking and public access space along West Promenade but would require traffic reassignment for the banned movement to adjacent roads.

17.6 Assumptions and limitations

- For the construction phase, the number of Light Duty Vehicle (LDV) and Heavy Duty Vehicle (HDV) movements required during construction, along with the necessary traffic management measures are currently unknown. These would be confirmed and considered in the TR in consultation with the main contractor when these are known;
- More information on the distribution of traffic across the local road network during the construction period would be detailed in the TR. Road closures may be required, and temporary traffic management may be necessary at certain stages of the Scheme;
- It is also assumed that temporary diversions would be required to the NCN 5, PRoWs and bus routes, which would be agreed during scoping of the TR with CCBC and the main site contractor; and
- Existing recent CCBC traffic survey data would be utilised (if available). Due to the effects of Covid-19 and non-normal conditions, additional traffic survey counts are not anticipated to be representative at the current time.

17.7 Key guidance and best practice

Preparation of the TR would be carried out with due regard to the following:

- DMRB Volume 11: Environmental Assessment;
- IEMA (2004) Guidelines for EIA;
- IEMA (2003) Guidelines for the Assessment of Road Traffic;
- Planning Policy Wales;
- TAN 18: Transport;
- Manual for Streets (2007);
- Conwy Local Development Plan, 2007 – 2022 (Adopted 2013);
- Active Travel (Wales) Act, 2013; and
- Local Transport Note 1/20: Cycle Infrastructure Design.

17.8 Potential effects

17.8.1 Construction phase

It is expected that during the construction phase, anticipated to last approximately 12 months, there would be a temporary short-term transport impacts, including:

- Increase in traffic flows due to the delivery of construction materials, construction vehicles and the day-to-day movement of construction staff. Note, the daily volume of construction vehicles is expected to be low as the majority of construction material is planned to be transported by sea. The routing of construction vehicles would be agreed with CCBC;

- Temporary closure of West Promenade (either in full or in part) to vehicles, pedestrians and cyclists during construction. During these periods, temporary diversion routes and associated signage would be agreed with CCBC; and
- Construction compounds would be required, accommodating construction vehicles, workers compounds, construction material and vehicle parking. The location and access arrangement would be agreed with CCBC.

Overall, the transport impact (vehicles, pedestrians, cyclists, public transport) during the construction phase would be expected to be low on both the local roads and access junctions from the A55 Expressway.

17.8.2 Operational phase

Transport related effects could arise from an increased travel demand, which would be identified through the TR. In advance of the assessment, detailed discussions would be held with the Highway Authority to ensure the assessment is appropriate. It is anticipated that on completion of the works the operation of the wider local highway network would remain largely unaffected in terms of motorised traffic. However, depending upon the transport and access option taken forward, the traffic impact of the scheme could be significant if West Promenade is made one-way.

On completion of the Scheme active travel provision would be significantly improved. Cyclists and pedestrians would have an improved, attractive and safe route, which is expected to result in an increase in recreational and commuter use, encouraging sustainable travel and improved health and wellbeing.

17.8.3 Effect summary

The principal construction stage effects are anticipated to be largely minimal, however there may be some requirement for temporary traffic management to support the partial or full closure of West Promenade to all modes. This would be agreed with CCBC during the scoping of the TR.

The TR would include the construction phase and the impact this could have on the local highway network. It would include a Construction Traffic Management Plan produced by the main contractor to inform construction and minimise adverse effects.

Assumptions about site access and traffic management would be discussed with CCBC with the aim of minimising any construction related impact.

The scoping assessment for the TR would be agreed with CCBC and any relevant statutory consultees.

It is not anticipated that existing traffic volumes and travel patterns would change significantly on the wider transport network on completion of the works. Traffic reassignment local to the proposed development may however be significant if the one-way system preferred option is taken forward.

Table 17.1 details the anticipated construction and operational effects of implementing the Scheme. A confirmatory scoping opinion is requested from all relevant statutory consultees.

Table 17.1: Potential effects

Effects	Construction	Operation
Potential Non-Significant Effects	Construction traffic could temporarily impact on the quality of life of residents.	Increase in the usage of the promenade for walking and cycling to take advantage of the improved facilities.

Effects	Construction	Operation
	The transportation of construction material may have a short-term environmental impact. The temporary closure of West Promenade (either in full or in part) would affect local traffic, bus walking and cycling routes, but alternative and suitable diversion routes would be made available. Occasional changes to traffic volumes on the local road network due to HGV's delivering construction material (depending on construction traffic routes from different locations), and also the day to day movement of construction workers. Temporary traffic management is likely to be required during the construction period. Significant transport effects in relation to the use of Traeth Pensarn above mean high water as a potential pipeline construction area are not currently anticipated, however given the lack of data at this time as to whether this area would be used or not, it would be considered further in the TR.	
Potential Significant Effects	None identified, assuming the measures identified in the TR are implemented during construction.	If the traffic and access arrangement required to support the preferred redevelopment of West Promenade includes the preferred option of the one-way system this has the potential to result in significant effects.*
Scoped In/Out	**Scoped Out***	**Scoped In***

Source: Mott MacDonald Ltd, 2020

* Should operational traffic flows not be altered in the Cayley Promenade and West Promenade area (maintenance of two-way traffic flows along West Promenade), then operational transport effects would be likely to be scoped out.

A confirmatory scoping opinion for this discipline is requested.

17.9 Transport Report

A TR would be prepared and developed based on the following principal activities:

- Review of existing transport conditions to identify the characteristics of the local road network, which would assist in determining the sensitivity of potential nearby receptors;
- Review of highway safety – where the proposed construction works are expected to produce a change in the character of the traffic on the local road network;
- Review of construction vehicle routing and quantification of volumes during the construction period;
- Review of existing pedestrian and cycle amenity and their respective facilities during construction;
- Review of locations of construction compounds and parking arrangements for construction staff; and

- Review of temporary diversion routes for the local highway network and active travel routes including the NCN 5 route.

To support the production of the TR:

- Existing CCBC traffic survey data would be utilised. Due to the effects of Covid-19 and non-normal conditions, additional traffic survey counts are not anticipated to be required; and
- Road Traffic Collison data would be obtained and reviewed in the TR.

A Construction Traffic Management Plan would be developed by the main contractor to provide additional clarity on the vehicle movements and temporary traffic management arrangements during construction. This would enable a revised scoping to be undertaken and, if necessary, further assessment.

17.10 Proposed methodology

The proposed EIA methodology for the assessment of Transport, Traffic and Access effects can be found in C.10.

18 Proposed ES Scope and Methodology

18.1 Technical scope

The ES must include a description of the aspects of the environment, which are likely to be significantly affected by the Scheme. Table 18.1 therefore sets out those disciplines that are proposed to be scoped into and out of the ES based on the scoping assessments completed within Chapters 7 to 17 of this report.

A confirmatory scoping opinion for each discipline is requested from all relevant statutory consultees.

Table 18.1: Disciplines to be Scoped In/Out of the EIA

Topic	Construction	Operation
Air Quality	IN	IN*
Archaeology and Cultural Heritage	IN	OUT
Biodiversity	IN	IN
Climate: Climate Change	IN	IN
Climate: Resilience	OUT	OUT
Coastal Processes: Coastal Hydromorphology	IN	IN
Coastal Processes: Flood Risk	OUT	IN
Coastal Processes: Water Quality	IN	IN
Coastal Processes: Navigation	OUT	OUT
Geology and Soils	OUT	OUT
Landscape and Visual: Landscape	IN	OUT
Landscape and Visual: Visual	IN	IN
Materials and Waste: Materials	IN	IN****
Materials and Waste: Waste	OUT	OUT
Noise and Vibration: Noise	IN	IN*
Noise and Vibration: Vibration	IN	OUT
Population and Health	IN	IN
Traffic, Transport and Access	OUT**	IN*
Cumulative Impacts	IN	IN
Risk of Major Accidents and Disasters	OUT***	OUT***

Source: Mott MacDonald Ltd, 2020

*Should operational traffic flows not be altered in the Cayley Promenade and West Promenade area (maintenance of two-way traffic flows along West Promenade), then operational effects for these chapters would be likely to be scoped out.

**Transport Report required.

*** Given that the principal aim of the Scheme is to provide coastal defence and reduce the risk of damage to key infrastructure in the Colwyn Bay area and that construction best practice would be utilised, the risk of major accidents and disasters is not considered to be significant and has been scoped out of the EIA.

****Possibility to be scoped out as more information becomes available on maintenance activities.

18.2 Temporal scope

18.2.1 Environmental baseline

As a general principle, environmental effects would be assessed by comparing the predicted state of the environment without the Scheme and with the state of the environment with the Scheme for a particular year. This would include an outline of the likely evolution of the site environment without implementation of the development as far as changes from the baseline scenario can be predicted. This baseline evolution may include future trends such as air quality and traffic growth.

18.2.2 Duration of effects

Environmental effects would be classified as either permanent or temporary, as appropriate. Permanent changes are those which are irreversible or would last for the foreseeable future.

The duration of temporary environmental effects would be defined as short, medium or long term based on the likely durations of the construction and operational phases of the development. These definitions would be considered within the assessment of the likely significant effects and would be set out in the ES.

Where environmental effects would be infrequent or intermittent this would be noted in the ES and the frequency considered in the assessment.

18.2.3 Phases of the Scheme

18.2.3.1 Construction

Certain environmental effects would only occur during construction of the Scheme and would cease once construction activities have ceased. These would typically be the temporary effects of the Scheme and would be described as “short-term” or “medium-term”, as appropriate, using the definitions determined to be appropriate and set out in the ES.

18.2.3.2 Operation

Environmental effects that occur during the operation of the project would typically be permanent or “long-term”.

18.2.3.3 Decommissioning

The Scheme is anticipated to be operational in perpetuity, therefore it is not proposed that the ES would address decommissioning.

18.3 Spatial scope

The spatial extent of each of the technical assessments would vary from one to another in accordance with the relevant policy and guidance for the assessment of that discipline as detailed in the individual Chapters. Typically, the study area would comprise the site and those areas that surround the site but are excluded from it.

For some disciplines it would extend further from the site boundary where there is the potential for effects to be significant over a wider area (e.g. as a result of traffic generated by the development).

The study area for each technical assessment would be identified and described as appropriate in each of the discipline Chapters of the ES.

18.4 Assessment of effects

18.4.1 Types of effects

The EIA would report on the likely significant effects for the construction and operational phases of the Scheme.

Account would be taken as appropriate as to whether effects are:

- Direct Effects – effects that are caused by activities which are an integral part of the Scheme;
- Indirect Effects – effects arising indirectly from the construction or use of a development;
- Secondary Effects – arising in consequence of indirect effects;
- Cumulative Effects – effects that result from different sources, but which affect a common receptor resulting in a greater combined effect;
- Transboundary Effects – effects caused by a Scheme that are experienced across a boundary;
- Temporary Effects – Environmental effects that occur during the construction of a project would typically be temporary;
- Permanent Effects – Permanent effects are those which are irreversible, would last for the foreseeable future or are effects considered to last greater than ten years;
- Beneficial Effects – Effects that have a positive influence on the environment; and
- Adverse Effects – Effects that have an adverse influence on the environment.

18.4.2 Methodology for assessing significance

The method for assessing significance of effects varies between environmental disciplines and a proposed outline for each discipline is provided in Appendix C.

In principle, as this is a linear scheme with highways elements, the overarching Environmental Assessment Methodology to be followed would be the one outlined in DMRB LA104[143]. For many Chapters, the assessment methodology would be based on the environmental sensitivity (or value/importance) of a receptor and the magnitude of change from the baseline conditions as represented by the significance of effect matrix in Table 18.2.

It should be noted that the assignment of significance would be based on professional judgement and the matrix below is only a tool to assist with the process.

Table 18.2: Significance of Effect

		Value/sensitivity of effect				
		Very High	**High**	**Medium**	**Low**	**Negligible**
Magnitude of effect	**Major**	Very Large	Large to Very Large	Moderate to Large	Slight to Moderate	Slight
	Moderate	Large to Very Large	Moderate to Large	Moderate	Slight	Neutral to Slight
	Minor	Moderate to Large	Slight to Moderate	Slight	Neutral to Slight	Neutral to Slight

[143] Highways England (2019) Design Manual for Roads and Bridges (DMRB) LA 104 Environmental Assessment and Monitoring Revision 1

	Value/sensitivity of effect				
	Very High	**High**	**Medium**	**Low**	**Negligible**
Negligible	Slight	Slight	Neutral to Slight	Neutral to Slight	Neutral
No change	Neutral	Neutral	Neutral	Neutral	Neutral

Where the significance of effect can be summarised as follows:

- **Very Large:** Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category;
- **Large:** These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process;
- **Moderate:** These beneficial or adverse effects may be important but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor;
- **Slight:** These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process but are important in enhancing the subsequent design of the project; and
- **Neutral:** No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

For some specific discipline assessments, guidance or the nature of the effect requires that differing criteria or scales for determining significance are to be used, however, wherever possible there would be consistency of terminology and conclusions would tie in with the above.

Effects that are described as ‘very large’, ‘large’ or ‘moderate’ are determined to be significant; and effects that are described as ‘minor’ or ‘negligible’ are determined to be not significant.

18.4.3 Impact interactions (cumulative impacts)

The EIA Regulations require the consideration of the potential impacts of:

- Inter-relationships of different environmental disciplines; and
- Cumulative effects of other existing and/or approved development.

The EIA would consider as appropriate the potential for impact interactions leading to a cumulative environmental effect on a receptor being greater than each of the individual effects that have been identified.

Cumulative impacts would be assessed within a specific Chapter of the ES.

18.5 Mitigation

One of the most important functions of the EIA process is to identify ways to mitigate adverse environmental effects and identify opportunities that the Scheme may have for environmental enhancements. For mitigating significant adverse effects, in order of preference the following hierarchy would be followed:

- Enhancement – Opportunities that the Scheme may provide to enhance the local and wider environment;

- Avoidance – Designing a Scheme in such a way that avoids adverse effects on the environment;
- Reduction – Design the development or employ construction methodologies such that significant adverse effects identified are reduced; and
- Compensation – Providing off-site enhancement to compensate for where on-site mitigation has not been possible.

18.5.1 Primary, secondary and tertiary mitigation

EIA mitigation can be characterised depending on the stage of the assessment when it is considered[144]:

- Primary mitigation measures (impact avoidance measures embedded in design);
- Secondary mitigation (identified during the EIA assessment process, iterative design process to reduce or eliminate effects); and
- Tertiary mitigation measures in relation to residual effects (follow up measures, where necessary).

18.5.2 Residual effects

Environmental effects remaining after mitigation measures have been incorporated are termed residual effects and these would be fully described in the ES.

18.6 Monitoring

The EIA Regulations require "*the monitoring of any significant adverse effects on the environment of proposed development*". It is important to note that the Regulations only require the monitoring of effects that are both significant and adverse. The ES would therefore ensure that it is clear to the reader which, if any, effects are both adverse and significant and may therefore require monitoring and provide a schedule of proposed monitoring to clearly identify the monitoring that is proposed in relation to any significant adverse effects that have been identified.

18.7 Environmental Statement summary

Following the submission of this Scoping report to, and receipt of a scoping opinion from, CCBC and taking into account comments from all other statutory and non-statutory consultees, the ES would be prepared in compliance with the EIA Regulations. Reference would also be made to current and emerging best practice.

The ES would document the EIA process, describing the Scheme and setting out the policy context; giving full detail of the EIA methodology and any technical methodologies and data used in support of the assessment; present the assessment of likely significant environmental effects; detail any mitigation and enhancement measures that have been employed; and provide a schedule of proposed monitoring arrangements.

The ES would present the residual effects, and an assessment of the cumulative effects and impact interactions.

The ES would comprise of three volumes:

- Volume 1 – Main Text and Figures;

[144] IEMA (2016) Environmental Impact Assessment Guide to Shaping Quality Development [Online] Available at: https://www.iema.net/assets/uploads/iema_guidance_documents_eia_guide_to_shaping_quality_development_v7.pdf Accessed March 2021

- Volume 2 – Technical Appendices; and
- Volume 3 – Non-Technical Summary.

18.8 Consideration of alternatives

The EIA process provides an opportunity to influence the design of a development taking potential environmental constraints and opportunities into consideration before a final decision is taken on design. Early consideration of potential alternatives to the Scheme would ensure minimisation of risks and could also help to avoid likely environmental effects.

In accordance with the EIA Regulations, the ES would consider the reasonable alternatives to the preferred Scheme and compare the environmental effects with other alternatives qualitatively at high level using professional judgment. The alternatives would include the 'do nothing' scenario.

18.9 EIA Team competence

EIA Regulations require that, to ensure the completeness and quality of Environmental Statements, *"the developer must ensure that the environmental statement is prepared by competent experts*".

In line with the EIA Regulations, all contributors to the EIA are competent experts in EIA and this would be demonstrated in the ES with an overview of each key expert's qualifications, professional accreditations and experience.

19 Abbreviations

Table 19.1: Key Abbreviations

Abbreviation	Details
AOD	Above Ordnance Datum
AQMA	Air Quality Management Area
BGS	British Geological Survey
C&D	Construction and Demolition
CCBC	Conwy County Borough Council
CCRA	Climate Change Risk Assessment
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CPAT	Clwyd-Powys Archaeological Trust
D4RE	Design for Resource Efficiency
DEFRA	Department for Environment, Food & Rural Affairs
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
ES	Environmental Statement
FCERM	Flood and Coastal Erosion Risk Management
GI	Ground Investigation
HDV	Heavy Duty Vehicles
HER	Historic Environment Record
HGV	Heavy Goods Vehicles
HLMO	High Level Marine Objectives
HRA	Habitats Regulations Assessment
IAQM	Institute of Air Quality Management
IBA	Important Bird Area
LDP	Local Development Plan
LDV	Light Duty Vehicles
LIA	Local Impact Area
LNR	Local Nature Reserve
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
MCAA	Marine and Coastal Access Act
MHWST	Mean High Water of Spring Tides
MPS	Marine Policy Statement
NCN	National Cycle Network
NLCA	National Landscape Character Area
NO_2	Nitrogen dioxide
NMU	Non-Motorised User
NMWTRA	North and Mid Wales Trunk Road Agency
NRW	Natural Resources Wales
NSR	Noise Sensitive Receptor

Abbreviation	Details
NWC	North Wales Coast
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 microns
PPW	Planning Policy Wales
PRoW	Public Rights of Way
RCAHMW	Royal Commission on the Ancient and Historical Monuments of Wales
RIGS	Regionally Important Geological Site
RLB	Red Line Boundary
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SWMP	Site Waste Management Plan
TAN	Technical Advice Note
TR	Transport Report
TSHD	Trailing Suction Hopper Dredger
UKCP18	United Kingdom Climate Projections 2018
WBFGA	Well Being of Future Generations Act
WFD	Water Framework Directive
WG	Welsh Government
WIA	Wider Impact Area
WNMP	Welsh National Marine Plan
ZOI	Zone of Influence
ZTV	Zone of theoretical Visibility