Conwy County Borough Council

Penrhyn Bay Coastal Defence Improvements

WFD Assessment

P02 |26 October 2021

Job number

Ove Arup & Partners Ltd
4 Pierhead Street,
Capital Waterside,
Cardiff
CF10 4QP
www.arup.com

ARUP

Contents

1 Introduction

Arup has been commissioned by Conwy County Borough Council (CCBC) to undertake a Water Framework Directive (WFD) Assessment for the scheme known as Penrhyn Bay Coastal Defence Improvements.

Under the WFD[1] , all proposed schemes with the potential to impact upon WFD-designated water bodies must be assessed to ensure:

- no deterioration of the current status or potential of any WFD quality elements; and
- no prevention of future attainment of the 'good' status or potential objectives of any WFD quality elements.

This is also consistent with the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

This report follows guidance produced by Natural Resources Wales[2] (NRW) to produce a WFD Assessment Report which identifies the activities related to the scheme that may cause deterioration or prevent a water body from meeting its objectives. The report follows the scoping template provided as part of this guidance, along with a detailed impact assessment of residual risk identified.

[1] European Commission. Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.
Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

[2] Natural Resources Wales / Environment Agency. Water Framework Directive assessment: estuarine and coastal water. Available at: https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters

2 Project Details

Your activity	Description, notes or more information
Applicant name	Conwy County Borough Council
Application reference number (where applicable)	N/A
Name of activity	Creation of a T-shape rock groyne and works to ensure long term beach and coastal defence integrity.
Brief description of activity	1) Creation of T-shaped rock groyne 2) Beach nourishment of similar material to existing beach deposits to create a 10m minimum buffer between high tide line and sea defence wall
Location of activity (central point XY coordinates or national grid reference)	SH 827 816
Footprint of activity (ha)	c. 9.2
Timings of activity (including start and finish dates)	Due to works at low tide, the timeframe is uncertain until a contractor is appointed.
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	1) Rock armour (including under layers and core) will be selected based on size suitability to complete the 100m x 90m groyne. Exact volume to be determined when height of groyne is finalised. 2) Volume of beach nourishment is yet to be determined
Use or release of chemicals (state which ones)	Relevant potentially polluting sources include: raised suspended sediment concentrations and accidental spills; e.g. concrete or fuel oils from construction plant.

3 WFD Baseline

Water body[3]	Description, notes or more information
WFD water body name	*North Wales coastal water body*
Water body ID	*GB641011650000*
River basin district name	*Western Wales*
Water body type (estuarine or coastal)	*Coastal*
Water body total area (km^2)	*146.25*[4]
Overall water body status (2018)	*Moderate*
Ecological status	*Moderate*
Chemical status	*Fail*
Target water body status and deadline	*Good by 2021*[5]
Hydromorphology status of water body	*Not designated*
Heavily modified water body and for what use	*Yes – Coastal Protection*
Higher sensitivity habitats recorded	*Kelp Beds: inshore west of the study area and below MLWS beyond the eastern breakwater.* *Mussel beds: almost along the entirety of the tidal beach area – no evidence of mussel beds recorded during the Extended Phase 1 Habitat Survey or Intertidal Biotope Survey.*
Lower sensitivity habitats recorded	*Intertidal Soft Sediment, subtidal soft sediment, gravel and cobble intertidal & subtidal coarse sediment within the bay.* *There is also a subtidal boulder field within the study area.*
Phytoplankton status	*Moderate*
History of harmful algae	*NA (Not a category in Wales data)*
WFD protected areas within 2km	*Shellfish Water Protected Area 2013: Rhos-on-Sea* *Liverpool Bay SPA* *Menai Strait and Conwy Bay SAC*

[3] *Water body information can be found in the Natural Resource Wales's 'Water Watch Wales' and the water body summary table. Magic maps provide additional information on habitats and protected areas.*
[4] *Area data from 2015 Cycle 2 as it was absent from 2018 Cycle 2*
[5] *From the 2017 objectives spreadsheet (https://drive.google.com/file/d/0B2hsDbbdxz1tcUdGV1c5U0dXMkk/view?resourcekey=0-gAzLAdkmrhJ31gIvRhGTUQ)*

4 Screening Assessment

Waterbody	Screened In/Out	Rationale
North Wales coastal waterbody	In	Due to the proposed works within the coastal waterbody, there are potential pathways to affect its current WFD status or prevent it from attaining future objectives.

5 Scoping Assessment

5.1 Hydromorphology

Consider if your activity:	Impact assessment required?	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status	No	Not a WFD waterbody of High status
Could significantly impact the hydromorphology of any water body	No	Relatively minor structure in relation to size of waterbody
Is in a water body that is heavily modified for the same use as your activity	Yes	Water body designated as heavily modified due to coastal protection.

5.2 Biology

5.2.1 Habitats

Listed below are habitats that need to be included within a WFD assessment (not site specific). For this assessment habitats highlighted are present at the site and will be taken forward.

Higher sensitivity habitats[6]	Lower sensitivity habitats[7]
~~Chalk reef~~	Cobbles, gravel and shingle
~~Clam, cockle and oyster beds~~	Intertidal soft sediment (sand and mud)
~~Intertidal seagrass~~	~~Rocky shore~~
~~Maerl~~	~~Subtidal boulder fields~~
~~Mussel bed, including blue and horse mussel~~	~~Subtidal rocky reef~~
Polychaete reef (e.g. *Sabellaria* spp).	~~Subtidal soft sediments (sand and mud)~~

[6] *Higher sensitivity habitats have a low resistance to, and recovery rate, from human pressures.*
[7] *Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures.*

Higher sensitivity habitats[6]	Lower sensitivity habitats[7]
~~Saltmarsh~~	
~~Subtidal kelp beds~~	
~~Subtidal seagrass~~	

Consider if the footprint[8] of your activity is:	Impact assessment required?	Biology habitats risk issue(s)
0.5km^2 or larger	No	Combined area of the scheme (T-groyne and beach replenishment) does not exceed 0.5km^2
1% or more of the waterbody's area	No	Not ≤ 1% of water body area
Within 500m of a higher sensitivity habitat	Yes	Polychaete reef (e.g. *Sabellaria* spp).
1% or more of any lower sensitivity habitat	No	

5.2.2 Fish

Consider if your activity:	Impact assessment required?	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	No	N/A
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	No	N/A
Could cause entrainment or impingement of fish	No	N/A

[8] Note that a footprint may also be a temperature or sediment plume.

5.3 Water Quality

Consider if your activity:	Impact assessment required?	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	Yes	Potential for construction activities to displace sediment. Potential pathway for temporary increase in suspended solids and decreased oxygen levels.
Is in a water body with a phytoplankton status of moderate, poor or bad	Yes	Phytoplankton status 'Moderate'
Is in a water body with a history of harmful algae	-	NA (Not a category in Wales data)
If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	**Impact assessment required?**	**Water quality risk issue(s)**
The chemicals are on the Environmental Quality Standards Directive (EQSD) list	No	No proposal to discharge chemicals into the marine environment.
It disturbs sediment with contaminants above Cefas Action Level 1[9]	No	No proposal to undertake dredging or disposal of sediment as part of these works. Sediment mobilisation will be limited by control measures implemented by the contractor. If contaminated sediment is encountered during construction through olfactory or visual evidence, it will be stockpiled and tested separately.
If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	**Impact assessment required?**	**Water quality risk issue(s)**
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list	No	No discharge or outfall proposed. Products used during construction to be rock armour and marine grade concrete.

5.4 WFD Protected Areas

Consider if your activity is:	Impact assessment required?	Protected areas risk issue(s)
Within 2km of any WFD protected area[6]	Yes	Within 2km of: • Shellfish Water Protected Area 2013: Rhos-on-Sea • Menai Strait and Conwy Bay SAC Located in: • Liverpool Bay SPA

5.5 Invasive Non-Native Species (INNS)

Consider if your activity could:	Impact assessment required?	INNS risk issue(s)
Introduce or spread INNS	Yes	No marine invasive and Non-native Species were recorded during the Intertidal Biotope Survey, however there is a potential risk of introduction of invasive species via machinery. RAMS to include biosecurity risk assessment[10].

5.6 Scoping Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	Yes	HMWB designated for coastal protection – same as proposed activity.
Biology: habitats	Yes	Higher Sensitivity Habitats: Polychaete reef (e.g. *Sabellaria* spp).
Biology: fish	No	
Water quality	Yes	Potential for construction activities to displace sediment. Potential pathway for construction materials to enter waterbody.
Protected areas	Yes	Within 2km of: • Shellfish Water Protected Area 2013: Rhos-on-Sea • Liverpool Bay SPA Located in: • Menai Strait and Conwy Bay SAC
Invasive Non-Native Species	Yes	Potential risk of introduction of invasive species via machinery to be covered within RAMS biosecurity risk assessment.

[10] Cook, E.J., Macleod, A. Payne, R.D., and Brown, S. (2014) edited by Natural England and Natural Resources Wales (2015). *Marine Biosecurity Planning – Guidance for producing site and operation-based plans for preventing the introduction and spread of non-native species in England and Wales*.

6 Detailed Assessment

The WFD Scoping Assessment identified potential risks to the following receptors: hydromorphology, higher sensitivity habitats, water quality, protected areas and INNS.

A Preliminary Habitats Regulation Assessment (HRA) was prepared for the works in September 2021. This has assessed the potential for impacts to Liverpool Bay SPA and Menai Strait Conwy Bay SAC in detail. For brevity, the findings of the HRA have been used to inform the conclusion of this assessment as they relate to the same works and protected areas. Each assessment will support a Marine Licence application for the works.

6.1 Potential Risks

6.1.1 Hydromorphology

Hydromorphology was scoped in as a potential risk as the proposed works are within a water body that is heavily modified for the same use as the proposed activity.

The OBC concludes that the T-shape rock groyne and beach nourishment works will limit west-to-east transportation of sediment. Thus, enhancing the current coastal protection and reduce the current on-going maintenance requirements. As the proposals are intended to improve the functioning of current coastal protection measures, they are not considered to prevent attainment of a Good WFD status for the North Wales coastal waterbody.

6.1.2 Higher Sensitivity Habitats

Penrhyn Bay tidal area is dominated by Higher Sensitivity Habitat of Polychaete reef (e.g. *Sabellaria* spp).

The Penrhyn Bay Intertidal Biotope Survey Report concludes that there is no evidence of mussel beds along the foreshore; neither in-situ nor washed up in the strandline

In the absence of best practice, nearby higher sensitivity habitats may be at risk of direct effects or pollution incidents; e.g. sedimentation (from excavations or vehicle tracking) or accidental spillage (leaks from machinery/plant).

Best practice pollution prevention measures will be employed for marine working, as follows (in addition to biosecurity measures as discussed in Section 6.1.5):

- Site-specific methods will ensure that all site activities are controlled and are in accordance with standard operating procedures; e.g. Guidelines for Pollution Prevention (GPP) and CIRIA best practice.
- Limiting the physical works footprint and the dimensions of the access corridor as far as reasonably practicable.

- All plant will be sourced from a trusted reputable company and will come with spill kits which site personnel will be trained to use.
- Utilising a marine specific product; rapid set marine grade concrete.
- Vehicles will be loaded with all plant and materials necessary to undertake the works to minimise plant movements below MHWS.
- Minimal quantities of fuels, materials, etc. will be taken on to the foreshore with biodegradable fuel oils implemented where practicable.
- All storage containers will remain within the site compound and be appropriately bunded to prevent any spillages or leaks. No storage of materials or refuelling operations will be permitted outside the site compound.

As such, it is reasonable to conclude that no adverse impacts are predicted on higher sensitivity habitats.

6.1.3 Water Quality

Construction activities may displace sediment below MHWS. This provides a potential pathway for effect through sub-surface sediment being exposed to surface waters.

With no visual or olfactory evidence of contamination on the beach, it is likely the beach is made up of natural material. The risk of incidental disturbance resulting in contamination is therefore considered to be negligible.

The Contractor's Risk Assessment Method Statement (RAMS) will be reviewed when available to ensure standard best practice pollution control measures as detailed in Section 6.1.2 above are included.

6.1.4 Protected Areas

Liverpool Bay SPA lies adjacent to the work area to the North and Menai Strait Conwy Bay SAC occurs approximately 800m north-west of the site. The potential pathways for effect of pollution incident, is assessed within the Preliminary HRA Stage 1: Screening.

The HRA concludes that potential effects on the Liverpool Bay SPA and Menai Strait Conwy Bay SAC have been screened out due to the nature of the proposed works, spatial separation and negligible likelihood of interaction between potential effects and receptors.

No construction phase water quality effects are predicted from the proposed works and no mitigation measures are proposed to avoid, reduce or cancel potential effects (but see section 6.1.3). As standard best practice, the Outline CEMP includes requirements to adhere to best practice pollution prevention; e.g. GPP5 and CIRIA guidance.

As such, the HRA states that it is reasonable to conclude that there are **no likely significant effects**, either alone or in-combination with other plans and projects, resulting from the proposed improvement works.

6.1.5 Invasive Non-Native Species

Introducing plant to the marine environment incurs the risk of transporting INNS from one site to the next. To address this risk, the Contractor will include a Biosecurity Risk Assessment within their RAMS to ensure that all plant and equipment is deep-cleaned prior to arrival on site and following completion of works. The biosecurity measures proposed will accord with the latest NRW guidance[10].

6.2 Mitigation Measures

The driver behind this scheme is to reduce coastal flood risk. Remediating and ensuring the future stability of the coastal defences results in operational enhancements to the water environment.

Although it is believed that the beach sediment does not contain any chemicals or compounds identified in the Cefas action levels, if contaminated sediment is encountered during construction through olfactory or visual evidence, it will be stockpiled and tested separately.

The Contractor's Risk Assessment / Method Statement **(**RAMS) will be assessed when available and will outline the mitigation measures incorporated into the construction of the scheme; including the following:

- Site-specific methods will ensure that all site activities are controlled and are in accordance with standard operating procedures; e.g. Guidelines for Pollution Prevention (GPP) and CIRIA best practice.
- Limiting the physical works footprint and the dimensions of the access corridor as far as reasonably practicable.
- All plant will be sourced from a trusted reputable company and will come with spill kits which site personnel will be trained to use.
- Utilising a marine specific product; rapid set marine grade concrete.
- Vehicles will be loaded with all plant and materials necessary to undertake the works to minimise plant movements below MHWS.
- Minimal quantities of fuels, materials, etc. will be taken on to the foreshore with biodegradable fuel oils implemented where practicable.
- All storage containers will remain within the site compound and be appropriately bunded to prevent any spillages or leaks. No storage of materials or refuelling operations will be permitted outside the site compound.
- The scheme being undertaken in compliance with the relevant GPPs and industry best practice (e.g. Guidance for Pollution Prevention: works and maintenance in or near water: GPP5, PPG 21, CIRIA best practice).

7 Conclusion

The assessment has considered the potential risks to receptors associated with the proposed works at Penrhyn Bay Coastal Defence Improvements which include: T-shape rock groyne, beach nourishment works and sea wall repairs.

The key receptors are Liverpool Bay SPA that lies adjacent to the work area to the north, Menai Strait Conwy Bay SAC occurs approximately 800m north-west of the site, a Higher Sensitivity Habitat; Polychaete reef (e.g. *Sabellaria* spp), as well as Shellfish Water Protected Area 2013: Rhos-on-Sea.

Given that the potential impacts relate to protected areas, the findings of the Preliminary HRA prepared for the works have been used to inform the conclusion of this assessment.

This assessment considers that the risk which the scheme poses to the water environment does not, either alone or in-combination with other projects, give rise to any adverse effects upon WFD water bodies or habitats or prevent them from attaining good status in the future.

This assessment has been based on currently available WFD baseline data and design information for the scheme. It is considered a 'live' document and should be reviewed and updated during detailed design and construction, particularly if:

- NRW update or provide additional WFD baseline data for the relevant water bodies; and/or
- Significant changes to the nature, spatial extent, scale or construction methods of the scheme are made.

The outcomes of this assessment should be shared and agreed with NRW (as the regulatory authority for the WFD in Wales) as part of the Marine Licencing process.