



Environment, Roads & Facilities

Flood Risk & Infrastructure

Llanfairfechan Coastal Defences

Water Framework Directive Assessment

September 2024

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Issue and Revision Record

Document Title	Llanfairfechan Coastal Defences Water Framework Directive Assessment
Version	ERFCF2305N - Llanfairfechan Coastal Defences WFD
Status	First Issue
Filename	ERFCF2305N Llanfairfechan WFD.pdf

Revision	Notes	Date
P01	First issue	26/09/24

	Signature	Name	Date
Prepared by		A. J	10/09/24
Checked by		N. S	18/09/24
Approved by		D. D	19/09/24

Contents

Introduction	1
1.1 Purpose of this document	1
1.2 Project background	1
1.3 Site location	1
1.4 Scheme description	2
1.4.1 Coastal defence works	2
1.4.2 Anticipated Programme	2
2 WFD Assessment Methodology	3
2.1 The Water Framework Directive	3
2.2 WFD Assessment methodology	3
2.2.1 WFD baseline identification	3
2.2.2 Stage 1: WFD Screening	4
2.2.3 Stage 2: WFD Scoping	4
2.2.4 Stage 3: WFD Assessment	4
3 Waterbody Baseline Identification	5
4 Stage 1: Screening	7
5 Stage 2: Scoping	9
5.1 Protected areas	9
5.2 Sensitive habitats	9
5.3 Scoping outcome	10
5.4 Cumulative impacts	13
5.4.1 Other projects within proximity of the scheme	13
5.5 Summary	13
6 Stage 3: Impact Assessment	15
6.1 Assessment	15
6.2 Primary mitigation measures	15
6.3 Detailed compliance assessment	17
7 Outcomes and Conclusion	19
7.1 Assessment outcome	19
7.2 Conclusion	19
A. Drawings	21

Introduction

1.1 Purpose of this document

Conwy County Borough Council (CCBC) have produced this Water Framework Directive (WFD) Assessment to support the marine licence application for the proposed Llanfairfechan Coastal Defence Scheme (hereafter referred to as 'the Scheme').

The WFD Assessment has been prepared and assessed to determine if the Scheme is compliant with the objectives of the WFD. The assessment aims to determine the effects of the Scheme on ecological, hydromorphological and chemical quality and identify any potential impacts that could cause deterioration in the current status of the waterbody or could hinder the waterbody from meeting its WFD objectives in the future.

The Scheme would be compliant if the following criteria are met:

- There is no predicted deterioration in waterbody status; and
- The works do not prevent the future achievement of good overall status of the waterbody.

This report provides a summary of the site location and catchment context, a description of the proposals, WFD baseline and assessment of WFD compliance.

1.2 Project background

The sea defences at Llanfairfechan extend for approximately 1.8km around the coastline, comprising several forms of construction, using masonry, mass concrete and rock armour. The defences under consideration extend north-east to south-west from Shore Road East to the Afon Ddu (Llanfairfechan) and provide some protection to the promenade and town. However they are subject to overtopping during storm events and with climate change, the frequency and severity of these events is anticipated to increase. A section of the sea wall was breached during a storm in October 2021 with further damage to the frontage occurring in November and December that year. Storm Pierrick in April 2024 resulted in a flooding event across the entire Llanfairfechan frontage, including flooding of the properties lining the promenade. As a result, there is a need to improve the coastal defences along the frontage.

1.3 Site location

Llanfairfechan is a seaside town in North Wales, within the administrative area of CCBC. The A55 trunk road passes through the town, running parallel to the London-Holyhead railway, both of which separate the main town from the waterfront. The Scheme extends from the mouth of the Afon Ddu (Llanfairfechan) to the west, to the eastern extent of the promenade (see Red Line Boundary Plan ERCF2305N PLAN 009). The beach predominantly comprises sand and shingle with regular wooden groynes. A slipway is located in the centre of the Scheme area along with four pedestrian accesses through the sea wall, these are fitted with storm boards and a flood gate over winter periods. A pedestrian promenade and cycleway run along the length of the sea wall and are backed by the Promenade road to the eastern end of the Scheme. In the central section of the Scheme area, the promenade is separated from the road by amenity grassland and boat storage and to the western end, a car park and café. Residential houses, guest houses, a garden, playground and cafes line the vehicular promenade.

The Scheme itself focusses on the sea wall which separates the promenade from the beach. Though the existing sea wall is in relatively good condition, some sections require maintenance works which will be undertaken as part of the Scheme.

The national grid references for the western and eastern Scheme boundaries are approximately (SH 67834 75452) and (SH 68544 75570) respectively (see Red Line Boundary Plan, ERCF2305N PLAN 006 in Appendix A).

1.4 Scheme description

1.4.1 Coastal defence works

The proposed scope of work (see Design Drawings ERCF2305N PLAN 010 Proposed Sections, ERCF2305N PLAN 011 Proposed Sections, ERCF2305N PLAN 012 Proposed Elevations and ERCF2305N PLAN 013 Proposed Elevations in Appendix A) comprises repairs to, and increasing the height of, 725m of the existing sea wall by approximately 500mm using concrete. The main design consists of a cantilever retaining wall constructed from the promenade on the landward side of the existing sea wall, however approximately 140m will need to be constructed from the seaward side (from the promenade path on the seaward side of the wall).

This 140m length is to be constructed in front of the junction of the Promenade highway with Shore Road East and a private property. The design will consist of a 1.5m excavation in the existing promenade on the seaward side. The works in this location are approx. 3.0m above the Mean High Water Spring (MHWS) and approx. 2.5m from the foreshore, meaning the works will have minimal intrusion on the beach in this area.

The Scheme is currently at the outline design stage and the methodology is yet to be formally established, however it is anticipated that works will comprise the following:

- Temporary scaffolding (if required) - for re-pointing works alone, to be lifted from the promenade side of the sea wall onto the beach and which will be removed between tides (the intertidal area will be accessed by personnel on foot for construction of the scaffolding);
- Resin injection of existing cracks/joints on seaward side of the wall;
- Increase in the height of the sea wall and tie-in with the existing promenade on the landward side using concrete;
- Excavation of 1.5m into the existing hardstanding promenade on the seaward side and increase in the height of the sea wall for 140m at the eastern end;
- Installation of weep holes and flap valves along the sea wall (from the landward side); and
- Construction of grasscrete parking on the promenade side of the sea wall.

Access to the foreshore will be gained using existing accesses. Works will be limited to lower tidal states and no plant or machinery will be required on the intertidal area for the works.

Method statements and risk assessments will be produced by the contractor prior to commencement.

1.4.2 Anticipated Programme

As funding is yet to be secured for Scheme construction, the programme has not yet been confirmed. However, is anticipated to take 19 weeks with proposed working hours of 07:00 – 19:00, taking into account tidal constraints (low tide working).

Works through the winter period 2024/25 are anticipated due to funding constraints and to avoid busy holiday seasons.

2 WFD Assessment Methodology

2.1 The Water Framework Directive

The WFD¹ is a European Directive which aims to protect and improve the water environment. It became law in the UK in 2003. The current regulations are the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017² as amended by the Water Environment (EU Exit) Regulations 2019.

The WFD requires objectives to be identified and set for protecting and improving 'waterbodies'. These include rivers, streams, lakes, reservoirs, estuaries, coastal waters, canals and groundwaters.

The standard objective is to achieve 'good status', (or 'good potential' if the waterbody is artificial or has been extensively modified), and to protect the waterbody by preventing any deterioration in status. Good 'status or 'potential' is made up of ecological and chemical components. Ecological status consists of biological quality elements, physico-chemical supporting elements and hydromorphological supporting conditions. For groundwater, status consists of quantitative and qualitative elements.

2.2 WFD Assessment methodology

The assessment has been completed in accordance with Environment Agency guidance, 'Clearing the Waters for All'³, which provides information on completing WFD assessments within estuarine and coastal waters in England and Wales. This guidance recommends that WFD assessments are completed in a 3-stage approach:

- Stage 1 (Screening);
- Stage 2 (Scoping); and
- Stage 3 (Impact Assessment).

Details of these stages along with the definition of the baseline they are measured against are detailed in the following sections.

2.2.1 WFD baseline identification

The WFD baseline identifies the proximal WFD waterbodies including:

- River waterbodies;
- Coastal waterbodies; and
- Designated sites / Protected areas.

This baseline has been informed by a desk-based analysis of publicly available information using the sources provided in Table 2.1.

¹ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

² Regulations 2003 (subject to transitional provisions in article 38 of the 2017 Regulations).

³ Environment Agency (2017). Water Framework Directive assessment: estuarine and coastal waters. [online] Available at: <www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters>

Table 2.1: Desk-based study sources

Source	Link	Description
Natural Resources Wales (NRW) – Water Watch Wales	Cyfoeth Naturiol Cymru (naturalresourceswales.gov.uk)	Provides information on the WFD waterbodies.
Welsh Government – DataMapWales	Home DataMapWales (gov.wales)	Provides information on the WFD waterbodies, potential environmental constraints, Protected Areas and designated sites.
NRW – River Basin Management Plans (RBMPs)	Natural Resources Wales / Dee and Western Wales river basin management plans 2021-2027	Provides information on the designated River Basin Management Plans; the progress reports and the objectives.
Department of Environment, Food & Rural Affairs and (Defra) – MAGIC Map	Magic Map Application (defra.gov.uk)	Provides information on the WFD waterbodies, potential environmental constraints, Protected Areas and designated sites.

2.2.2 Stage 1: WFD Screening

Stage 1 is an initial assessment to determine if there are any activities associated with the works which may impact waterbodies within the vicinity. Those that are determined through expert judgement to have no impact due to their nature, frequency or activity are ‘screened out’. Consequently, the screening process excludes those activities that do not require scoping or impact assessment from further assessment.

Examples of the types of activity that may be ‘screened out’ are provided in the ‘Clearing the Water for All’ Guidance³.

2.2.3 Stage 2: WFD Scoping

Stage 2 comprises a more detailed assessment to identify risks from the proposed development to receptors (within the study area) based on the relevant waterbodies and their quality elements. The aim of this assessment is to identify if any waterbodies will require further detailed assessment.

Following the ‘Clearing the Water for All’ Guidance, receptors, which are based on the waterbody quality elements, are as follows:

- Hydromorphology;
- Biology – habitats;
- Biology – fish;
- Water quality; and
- Protected areas within 2km of the activity – this includes, Special Areas of Conservation (SACs), Special Protection Areas (SPAs), shellfish waters, bathing waters, and nutrient sensitive areas.

Invasive Non-Native Species (INNS) are also be considered a receptor at this stage.

2.2.4 Stage 3: WFD Assessment

Stage 3 is a detailed assessment of the activities carried forward from the screening stage. It must include the previously identified waterbodies, description of the proposed works, methods used to determine impacts, risk of deterioration, and mitigation required.

3 Waterbody Baseline Identification

Waterbodies within 10km of the project site have been identified for WFD screening, these are shown in Table 3.1. This distance was selected based on two tidal excursion ellipses⁴, a proxy for the extent to which waters mix in the area around the Scheme (and maximum dispersion should any deleterious substances enter the marine environment).

Table 3.1: Identification and screening of waterbodies within 10km of the Scheme

Waterbody name	Distance and direction from the Scheme	Screened in?	Justification
Menai Strait (coastal)	Directly adjacent	Yes	The works are located directly adjacent to these waterbodies and therefore, there is the potential for them to be impacted by construction.
Afon Ddu (river)	Directly adjacent	Yes	
Conwy Bay (coastal)	1.6km north-east	Yes	The works are adjacent to the Menai Strait waterbody, which is a connecting waterbody to Conwy Bay.
Aber (river)	3.5km south-west	No	Given the small-scale of the works and distance of the waterbody from the Scheme, no impacts are considered likely occur.
Anglesey North (coastal)	6.6km north	No	
Conwy (transitional)	6.8km north-east	No	
Lleiniog (river)	6.9km north-west	No	This waterbody is on the opposite side of the Menai Strait to the Scheme and is considered sufficiently separated.
Roe (river)	7.2km south-east	No	These river waterbodies are not hydrologically connected to the Scheme.
Ogwen – lower (river)	7.7km west south-west	No	
Cegin (river)	9.0km west south-west	No	

The status of the waterbodies screened in are shown in Table 3.2.

Table 3.2: Status of screened-in waterbodies

Waterbody ID	GB681010120000	GB110065058570	GB671010400000
Waterbody name	Menai Strait	Afon Ddu (Llanfairfechan)	Conwy Bay
Waterbody type	Coastal	River	Coastal
Waterbody total area	72km ²	N/A	49.7km ²
Highly modified (HMWB) and use	Natural	Natural	Heavily Modified
Overall status	Good	Good	Moderate
Chemical status	High	High	Moderate

⁴ ABPmer, 2017. UK Renewables Atlas [Online] Available at: [Explore the ABPmer UK Renewables Atlas \(renewables-atlas.info\)](https://renewables-atlas.info)

Waterbody ID	GB681010120000	GB110065058570	GB671010400000
Waterbody name	Menai Strait	Afon Ddu (Llanfairfechan)	Conwy Bay
Dissolved Inorganic Nitrogen	High	High	High
Dissolved Oxygen	High	High	High
Annex 8 chemicals, priority hazardous substances and other pollutants	High	N/A	High
Ecological status	Good	Good	Moderate
Invertebrates	Good	N/A	Moderate
Phytoplankton status	High	N/A	Good
Reason for Not Achieving Good status (RNAG)	N/A (good status)	Hydrological regime	• Invertebrates • Mercury and its compounds
Protected area(s)	• Liverpool Bay SPA • Traeth Lafan SPA • Y Fenai a Bae Conwy SAC	None	• Y Fenai a Bae Conwy SAC • Liverpool Bay SPA • Anglesey Terns / Morwenoliaid Ynys Môn
Bathing water	Llanfairfechan (ID: 40170)	N/A	Penmaenmawr (ID: 40180)
Shellfish water	Afon Menai (Dwyrain)/ Manei Strait (East)	N/A	Conwy

4 Stage 1: Screening

Activities associated with the construction of the Scheme which could have an impact on the water environment have been identified and the resulting effects have been screened into the WFD assessment, as outline in Table 4.1.

Table 4.1: Scheme elements and potential effects

Element of construction	Activities	Potential effect(s)	Screen in?
Mobilisation works and transportation of materials	- Setting up the compound - Construction of temporary scaffolding (if required) - Transportation of materials and equipment to the works area	Pollution event	X
		Decreased water quality	X
		Underwater noise	X
		Introduction/ spread of Invasive and Non-Native Species (INNS)	✓
		Temporary habitat loss	✓
Works on seaward side of sea wall	- Resin injection of existing crack/joint on seaward side of the wall - Construction of temporary scaffolding (if required) - Construction of cantilever seawall (140m eastern section)	Pollution event	✓
		Decreased water quality	X
		Underwater noise	X
		Introduction/ spread of INNS	✓
		Temporary habitat loss	✓
Works from the landward side of the seawall	- Construction of cantilever seawall - Installation of weep holes and flap valves	Pollution event	✓
		Decreased water quality	X
		Underwater noise	X
		Introduction/ spread of INNS	X
		Temporary habitat loss	✓
Demobilisation	Removal of all equipment and plant, compound demobilisation	Pollution event	X
		Decreased water quality	X
		Underwater noise	X
		Introduction/ spread of INNS	X
		Temporary habitat loss	X
Operation	Grasscrete parking***	Pollution event	X
		Decreased water quality	X
		Underwater noise	X
		Introduction/ spread of INNS	X
		Temporary habitat loss	X

*Temporary loss in available habitat for roosting birds due to scaffolding disturbance on the foreshore.

**Though permeable, grasscrete has the ability to filter pollutants in addition to reducing storm water runoff⁵. In addition, the grasscrete is proposed on existing amenity grassland and is not anticipated to differ from the current baseline, as a result it has not been considered further in this assessment.

⁵ Birkeland, Janis (2009) Eco-retrofitting - from managerialism to design. In: The Proceedings of Global Forum 2009 - Business as an Agent of World Benefit, 2 - 5 June 2009, United States of America, Ohio, Cleveland.

5 Stage 2: Scoping

Scoping identifies the relevant receptors in an area that could be affected by the screened-in activities associated with the Scheme from Stage 1.

5.1 Protected areas

Wider environmental legislation must be considered when assessing the compliance of proposals under the WFD. Proposals cannot be WFD compliant if they adversely affect the integrity of protected areas, WFD aims to achieve relevant standards or objectives for these sites.

Table 5.1 identifies protected areas within 2km³ of the Scheme. No Ramsar Sites were identified within 2km.

Table 5.1: Statutory designations within 2km of the Scheme

Designated Site	Distance from the Scheme	Scoped in?	Justification
Traeth Lafan/ Lavan Sands, Conway Bay Special Protection Area (SPA)	Within	✓	The Scheme is located directly adjacent to the designated site therefore, there is the potential for impacts during construction.
Traeth Lafan/ Lavan Sands, Conway Bay Site of Special Scientific Interest (SSSI)	Within	✓	
Menai Strait and Conwy Bay SAC	Within	✓	
Llanfairfechan Bathing Water	Directly adjacent	✓	
Traeth Lafan/ Lavan Sands, Conway Bay Local Nature Reserve (LNR)	Within	✓	The Scheme is located within the designated site therefore, there is the potential for impacts during construction.
Liverpool Bay/Bae Lerpwl SPA	250m north	✓	The features of the SPA are highly mobile species and can be present outside of the boundary of the site. As a result, there is the potential for impacts to these during construction.
Shellfish waters (Menai Strait East))	1.5km west	X	Given the small-scale of the works and distance of the designated sites from the Scheme, no impacts will occur to these.
Eryri National Park (NP)	1.5km south	X	
Nant y Coed LNR	1.6km south-south-east	X	

5.2 Sensitive habitats

'WFD sensitive habitats' have been identified within 500m of the Scheme. Higher sensitivity habitats present⁶ comprise blue mussel (*Mytilus edulis*) beds, located adjacent to the east of the Scheme and north of the Afon Ddu. The Scheme is also within a classified bivalve mollusc

⁶ Welsh Government, 2024. DataMapWales [online] Available at: [New map | DataMapWales \(gov.wales\)](#)

harvesting area for the common cockle (*Cerastoderma edule*), though no beds are recorded within 500m of the Scheme.

Lower sensitivity habitats present comprise the following:

- Cobbles, gravel and shingle;
- Intertidal soft sediments;
- Rocky shore; and
- Subtidal soft sediments (430m north).

Note: habitat information was obtained from desk-based sources and may be considered outdated, a pre-construction intertidal walkover survey will be required.

5.3 Scoping outcome

During construction, the Scheme may present potential risks to a number of WFD quality elements, see Table 5.2 for the scoping outcome. Receptors assessed comprise:

- Biology – habitats;
- Biology – fish;
- Protected areas;
- Water quality; and
- Introduction/spread of Invasive and non-native species (INNS).

Table 5.2: Scoping in/out of WFD quality elements

WFD quality element	Scoping criteria		Comment	Scoped into WFD impact assessment?
	Question	✓/ X		
Hydromorphology	Could the activity impact on the hydromorphology (for example morphology or tidal patterns) of a waterbody at high status?	X	No works are occurring within the waterbodies and given the small-scale nature of the works, no significant changes to the hydromorphology are anticipated.	X
	Could the activity significantly impact the hydromorphology of any waterbody?	X	None of the waterbodies will be changed in shape.	X
	Is the activity in a waterbody that is heavily modified for the same use as your activity?	X	No works are occurring within the waterbodies; the Conwy (coastal) waterbody is a HMWB however is located 1.6km NE from the Scheme and given the small-scale nature of the works, no impacts are anticipated.	X
Biology (habitats)	Is the footprint of the activity 0.5km ² or larger?	X	The scheme (including works area) cover approximately 0.0075km ² .	X
	Is the area of the activity greater than 1% or more of the waterbody's area?	X	The Scheme works area will not exceed 1% of the waterbody's area.	X
	Is the activity within 500m of any higher sensitivity habitat?	✓	The Scheme is within 500m of recorded blue mussel beds.	✓
	Is the area of the activity 1% or more of any lower sensitivity habitat?	X	The works are taking place within lower sensitivity areas comprising intertidal soft sediment, cobbles, gravel and shingle however, do not exceed 1% of the area.	X
Biology (fish)	Is the activity in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish from entering it or could affect fish migrating through the estuary?	X	No, the works are taking place adjacent to coastal waterbodies.	X
	Could the activity 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)?	✓	Potential for chemical change through the introduction of pollutants when working on the foreshore however, given the small-scale nature of the Scheme any impacts from construction are unlikely to be of a scale large enough to have a significant impact.	X

WFD quality element	Scoping criteria		Comment	Scoped into WFD impact assessment?
	Question	✓ / X		
Water quality	Could the activity affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)?	X	The works will be limited to low tide.	X
	Is the activity in a waterbody with a phytoplankton status of moderate, poor or bad?	X	Phytoplankton status of the waterbodies are 'Good' or 'High'.	X
	Is the activity in a waterbody with a history of harmful algae?	X	No history of harmful algae at Llanfairfechan.	X
	Does the activity use or release chemicals? If so, are they on the Environmental Quality Standards Directive (EQSD) list?	X	No. the release or disturbance of chemicals is not anticipated.	X
	Will the activity disturb sediment with determinants above Cefas action level 1?	X	No activities are being undertake that would disturb sediments.	X
Protected areas	Is the activity within 2km of any WFD protected area?	✓	There are 12 WFD protected areas within 2km of the works; ● Menai Strait (coastal) waterbody ● Afon Ddu river ● Conwy Bay (coastal) ● Traeth Lafan SPA, LNR and SSSI ● Menai Strait and Conwy Bay SAC ● Llanfairfechan bathing water ● Liverpool Bay SPA ● Menai Strait (east) shellfish water (scoped out) ● Eryri NP (scoped out) ● Nant y Coed LNR (scoped out)	✓
Invasive non-native species	Could the activity introduce or spread INNS?	✓	Imported materials and plant have the potential to introduce INNS.	✓

5.4 Cumulative impacts

This section identifies the plans and projects proposed which may result in in-combination impacts on the marine environment. This section only includes plans/projects which have been applied for, and/or are believed to be taken forward (actively progressing), as required by the NRW Guidance Document.

5.4.1 Other projects within proximity of the scheme

A review of Gwynedd and Conwy council's planning applications identified no terrestrial projects were identified within 2km of the proposed Scheme which may result in in-combination impacts on the water environment^{7,8}.

The NRW Public register was also reviewed for any Marine Licence applications for Conwy, Isle of Anglesey and Gwynedd councils⁹, no projects were identified within 10km which may result in in-combination effects on the marine environment.

A distance of 10km was selected for marine/coastal projects based on the anticipated area of effect outlined in Section 3 and hydrological connectivity. Land-based planning applications were searched up to 2km as the area of effect is considered smaller.

5.5 Summary

The Scheme is located directly adjacent to the Menai Strait (coastal) and Afon Ddu (river) waterbodies and 1.6km south-west of the Conwy Bay coastal waterbody. Given the purpose of the Scheme is to improve the coastal defences, there is a potential for the scheme to impact on waterbody objectives, or ability to meet 'good' status. Therefore, these waterbodies need to be further considered in the Stage 3: Detailed Assessment.

Impacts on Protected Areas within or in close proximity of the Scheme during construction, cannot be ruled out of the screening assessment. Therefore, these sites need to be further considered in the Stage 3: Impact Assessment.

The WFD Elements to be considered further in the Stage 3: Detailed Assessment are summarised in Table 5.3.

Table 5.3: Summary of scoped-in WFD Elements

WFD quality element	Menai Strait (coastal), Conwy Bay (coastal) and Afon Ddu (river) waterbodies	
Hydromorphology	Not considered further	X
Biology - habitats	The Scheme is within 500m of a higher sensitivity habitat	✓
Biology – fish	Not considered further	X
Water quality	Not considered further	X
Protected areas	Numerous designations present.	✓
INNS	Use of plant and imported materials	✓
Cumulative impacts	Not considered further	X

⁷ Cyngor gwynedd, 2024. Planning applications [online] Available at: [Mapiau | Cyngor Gwynedd \(llyw.cymru\)](#)

⁸ Conwy County Council, 2024. Planning applications [online] Available at: [Planning Explorer - Conwy County Borough Council](#)

⁹ NRW, 2024. Marine Licence Applications [online] Available at: [Natural Resources Wales / Marine licence applications 2024](#)

6 Stage 3: Impact Assessment

6.1 Assessment

This section assesses the construction and operation activity interactions with the WFD waterbodies identified in Section 3. Impacts could arise from the following activities:

- Mobilisation works and transportation of materials:
 - Setting up the compound;
 - Construction of temporary scaffolding (if required); and
 - Transportation of materials and equipment to the works area.
- Works on seaward side of sea wall:
 - Resin injection of existing crack/joint on seaward side of the wall;
 - Construction of temporary scaffolding (if required); and
 - Construction of cantilever seawall (140m eastern section).
- Works from the landward side of the seawall:
 - Construction of cantilever seawall; and
 - Installation of weep holes and flap valves.

Given the small-scale nature of the Scheme, any impacts would be limited to the Menai Strait (coastal) and Afon Ddu (river) waterbodies located directly adjacent, and the Conwy Bay (coastal) waterbody located 1.6km north-east. The site compound will be located on the car park, separated from these waterbodies.

Three receptors were identified as being at risk from the scheme:

- Biology – habitats;
- Protected areas; and
- Introduction and/or spread of INNS.

6.2 Primary mitigation measures

As part of construction best practice, the project will be required to produce and enforce a Construction Environmental Management Plan (CEMP) which will outline the reasonable and practicable measures to be taken to minimise pollution risks to the surrounding environment. It is recommended that this CEMP includes (but is not limited to) the following measures:

- Identifying designated Control of Substances Hazardous to Health (COSHH) storage areas that are not within the marine environment;
- Ensuring bunded tanks and drip trays are utilised on site;
- Checking all equipment at the start of each working shift for leaks or faults;
- Imposing strict measures for minimising concrete use within the marine environment and using fast-setting concrete that is laid on an outgoing tide to ensure curing time is reached prior to the tides return or within watertight containment to prevent entry into the waters;
- Designating areas for concrete wash out that are not within the marine environment;
- Grout/concrete not to be mixed within 10m of waterbody or a surface water drain;
- All cement or concrete washout to be poured into a skip positioned on a waterproof membrane and bunded to contain any leakage from the skip, which would be appropriately disposed of off-site;

- The skip to be kept >10m from a waterbody or surface water drain and be in a suitable condition to prevent rainwater collecting;
- Ensuring that all machinery have accessible spill kits on hand;
- Outlining requirements for pollution spill drills with site staff;
- Requiring staff to undergo pollution toolbox talks prior to working on site;
- Storage of fuels and chemicals to be above any flood water level/tidal area, and where possible away from high-risk locations (more than 10m from a waterbody);
- In the event of a flood alert, all materials and equipment to be moved out of the area of flooding, to higher ground to avoid potential mobilisation of pollution;
- Implementation of a biosecurity risk assessment to include protocols for construction plant and vehicles operating within the intertidal area for the prevention of introduction and spread of INNS and disease within the marine environment. It should also outline contingency actions to take should INNS or disease be discovered on site;
- Pre-construction walkover surveys to be undertaken to search for the presence of INNS across the site prior to any works taking place. If INNS are identified, these will be cordoned off and avoided / dealt with appropriately as advised by suitably qualified ecologists (SQEs);
- Where possible, non-toxic substances to be used during the works to avoid any impact to the marine or aquatic environment. Refer to Material Safety Data Sheets for further information on substances should be fully cured/stabilised before exposing to marine waters to prevent exposure to marine organisms;
- Best practice dust control measures to be employed; and
- Best practice construction and hygiene measures to be implemented (avoiding littering, fires, storage of foods, etc).

6.3 Detailed compliance assessment

Table 6.1 provides further assessment of the construction activities in relation to the identified receptors, if significant effects are anticipated following the implementation of the primary mitigation measures set out in Section 6.2, suitable secondary mitigation recommendations have been identified to ensure WFD compliance.

Table 6.1: WFD detailed assessment

WFD element	Construction activities and potential impacts	Secondary mitigation measures, compliance and recommendations
Biology (habitats)	The Scheme is within 500m of a higher sensitivity habitat (Blue mussel beds). Construction of the temporary scaffolding could directly impact on these if present within the working area.	• A pre-construction walkover to identify and map the presence of any higher sensitivity habitats and if present, a buffer will be set up around the habitat (where possible) to prevent any direct impacts from movement of personnel and construction of scaffolding on the foreshore. • Standard best practice measures are to be followed throughout the construction phase including provision and enforcement of a CEMP. The CEMP will outline all the reasonable and practicable measures for managing pollution risk. • Imposing strict measures for minimising concrete use within the marine environment and using fast-setting concrete that is laid on an outgoing tide to ensure curing time is reached prior to the tides return or within watertight containment to prevent entry into the waters. Any impacts to the identified waterbodies are anticipated to be localised and not result in the deterioration at the waterbody scale, therefore, providing mitigation measures are implemented and standard best practice measures are followed, the construction activities will be WFD compliant.

Protected areas	Movements of plant/machinery and personnel along the foreshore during the mobilisation, repair and demobilisation works could have the following impacts: • Pollution event; • Introduction/spread of INNS ; • Temporary habitat loss; and • Airborne noise and visual disturbance to designated bird features.	• Land-based works to raise the height of the seawall will not be undertaken when the water is within 20m of the base of the seawall on the incoming tide and will not be able to re-commence until the water is at least 5m from the base of the seawall on the outgoing tide. • The mitigation listed above under biology (habitats) is also applicable to protected areas. • Maintain all equipment so that loose panels and cover plates do not cause unnecessary noise. • Works will not be undertaken during hours of darkness. • If designated bird features are present in close proximity to the repair works, where deemed appropriate, physical barriers will be erected to provide screening from the movement of plant and personnel. • Appropriate ecological mitigations measures to be implemented in line with the Habitats Regulations Assessment (HRA) (ERFCF2305N - Llanfairfechan Coastal Defence HRA). Following the above mitigation measures and standard best practice measures as above, the construction activities will be WFD compliant.
INNS	The Scheme will require the use of machinery and personnel on the foreshore, as such there is the potential for the introduction and/or spread of INNS.	• A biosecurity risk assessment to be completed as part of the CEMP. • Toolbox talks should be held for workers to understand the importance of the control of INNS. • Pre-construction walkover surveys to look for presence of existing INNS across the site should be undertaken. If identified, these areas will be made aware to site workers and suitable buffers set up around them to avoid potential spread through the site. • If INNS are spotted on site, work will be stopped, and the environmental supervisor should be notified immediately. • Management measures such as the use of virkon (a disinfectant), and deep cleaning plant and machinery before arriving at the site and changing sites along with adhering to a Clean-Check-Dry procedure will be implemented. Any impacts to the waterbody are anticipated to be localised and not result in the deterioration at the waterbody scale, therefore, providing mitigation measures are implemented and standard best practice measures are followed, the construction activities will be WFD compliant.

7 Outcomes and Conclusion

7.1 Assessment outcome

The Scheme has undergone a 3-stage approach Water Framework (WFD) assessment. The Stage 1 screening assessment found that the construction and operation had the potential to impact the Menai Strait (coastal), Afon Ddu (river) and Conwy Bay (Coastal) waterbodies.

Stage 2 of the assessment identified of the five receptors associated with the WFD waterbodies, (Biology (habitats), Protected Areas, and INNS have the potential to be impacted by the Scheme.

Stage 3 of the assessment identified that the potential impact pathways present are of low risk, and the construction activities are unlikely to affect or cause deterioration of the WFD waterbodies. Given the relatively small scale of works in relation to the waterbodies, any impacts are anticipated to be localised and short in duration when best practice and advised mitigation are in place (see Section 6).

As such, the impacts to biology (habitats), biology (fish), water quality, protected areas and from potential introduction INNS are not considered to be significant. Therefore, no deterioration of WFD status in the Menai Strait (coastal) and Afon Ddu (river) and Conwy Bay (Coastal) waterbodies are anticipated.

7.2 Conclusion

The 3-stage assessment identified that the potential impact pathways present are of low risk, and the construction activities are unlikely to affect or cause deterioration of the WFD waterbodies identified with the proposed mitigation in place.

Appendices

A. Drawings