LOUTH COUNTY COUNCIL

APPROPRIATE ASSESSMENT REPORT

FOR

PROPOSED COASTAL PROTECTION WORKS, BELLURGAN POINT, DUNDALK, CO. LOUTH

VOLUME I. REPORT

9th January 2024

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1.1 Project Planning Background

Louth County Council wishes to carry out coastal protection works at 3 locations along the foreshore to the east of the Quay at Bellurgan Point, Dundalk, County Louth (see Figures 1-6 and Plates 1 and 2 following). Damage has occurred at 3 locations along this sea front. Soil erosion has occurred and boulders have been displaced by wave action during storm conditions along the upper foreshore. The three site work areas are referred to as Locations A, B and C (see Figures 7, 8, 11 and 12). Louth County Council proposes to provide additional coastal protection at these locations in order to improve and augment the existing coastal protection works. The proposed works are intended to have a lifespan in excess of 50 years, thereby providing long term protection to the public road, existing residences and utility infrastructure. Subject to planning approval, the proposed works are likely to take 2 – 4 weeks to construct.

In order to proceed with the proposed coastal protection works, Louth County Council is required to submit a planning application to An Bord Pleanála under Section 177AE (relating to Appropriate Assessment (AA)) of the Planning and Development Act, 2000, as amended. Given the location of the site proposed for the coastal protection works, which are inside a Natura 2000 site, an appropriate assessment screening process is required with a natura impact statement prepared for the application. The results of the appropriate assessment screening process are discussed in the following section, Section 3. This document provides information to allow the planning authority (An Bord Pleanála) to carry out a planning assessment of the proposed project. This document will assess whether significant effects to the integrity of the Natura 2000 network are likely to occur as a result of granting planning permission in accordance with Article 6(3) of the Habitats Directive and the Planning and Development (Amendment) Act. It will determine whether mitigation measures are required to ensure that negative effects can be avoided to the Natura 2000 network. Article 6(3) of the Habitats Directive and the Planning and Development (Amendment) Act states the following:

'6. Appropriate Assessment screening

On the basis of the information provided with the application and in the absence of screening for Appropriate Assessment /Natura Impact Statement the Planning Authority cannot be satisfied that the proposed development (which is within Dundalk Bay SPA and in close proximity to Dundalk Bay SAC) individually, or in combination with other plans or projects would not be likely to have a significant effect on the designated Natura 2000 site or any other European site, in view of the site's Conservation Objectives. The applicant is therefore requested to undertake and submit a screening report for Appropriate Assessment and /or Stage 2 AA (NIS) in order to determine the likelihood of any significant adverse effects on the integrity of the aforementioned European sites in view of the sites' conservation objectives. (6 copies)'

Plate 1. Aerial photograph taken of the proposed work area at 70m elevation facing in a northerly direction.

Plate 2. Aerial photograph taken of the proposed works area at 70m elevation taken facing in an westerly direction.

1.2 Project Works Description

The objective of the proposed works at Bellurgan is to provide coastal defences at 3 locations, Locations A, B and C (refer to Drawing No. CE 2023-01-01 Rev. A) as follows:

Location A

- Approximately between Chainage 0m and 60m;
- 60 linear meters of basic excavation works, approximately 1m deep and approximately 1-3m wide;
- Placement of a geotextile membrane; and
- Installation 60 linear meters of rock armour protection.

Location B

- Approximately between Chainage 205m and 220m;
- 15 linear meters of basic excavation works, approximately 1m deep and approximately 1-3m wide;
- Placement of a geotextile membrane; and
- Installation of 15 linear meters of rock armour protection.

Location C

- Approximately between Chainage 220m and 245m;
- Replacement and resetting of displaced stonework to existing coastal protection works over an area of approximately 100sq.m; and
- Provision of a concrete layer to the underside of reset stonework.

2 METHODOLOGY FOR APPROPRIATE ASSESSMENT

2.1 Introduction

A number of guidance documents on the appropriate assessment process have been referred to during the preparation of this NIS, including:

- *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities* (DoEHLG 2009, Revised February 2010);
- *EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (2007);*
- *Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (Nov. 2001 – published 2002);
- *Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC* (2000); and
- *European Communities (Birds and Natural Habitats) Regulations 2011* (DoEHLG 2011).

The assessment requirements of Article 6 of the Habitats Directive are commonly dealt with in a stage-by-stage approach. The stages as outlined in *"Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities"* are outlined below.

2.2 Stage 1 – Screening

This initial process identifies the likely impacts of a proposed project or plan upon a Natura 2000 site, either alone, or in combination with other projects or plans and considers whether these impacts are likely to be significant.

2.3 Stage 2 – Appropriate Assessment

The consideration of the impact of the project or plan on the integrity of the Natura 2000 Site, either alone or in combination with other projects or plans to the sites structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.

2.4 Stage 3 – Assessment of Alternative Solutions

The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site.

2.5 Stage 4 – Assessment where Adverse Impacts Remain

An assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed. It should be noted that neither *Stage 3 Assessment of Alternative Solutions* nor *Stage 4 Assessment* where Adverse Impacts Remain were applicable in this instance, as the proposed coastal protection works will not adversely affect the integrity of any Natura 2000 site and, in particular, it will not adversely affect the Dundalk Bay SAC/SPA once mitigation measures are put in place.

3 SCREENING

According to the guidelines as laid by NPWS (2009), Appropriate Assessment Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3):

' i) Whether a plan or project is directly connected to or necessary for the management of the site; and ii) Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a Natura 2000 site in view of its conservation objectives.'

As the footprint of the proposed Coastal Protection Works (i.e., Locations A, B and C) at Bellurgan are inside the boundary of the Dundalk Bay Special Protected Area [004026] and within 4-5m of Dundalk Bay Special Area of Conservation [000455], the works are directly connected to both the SPA and the SAC which are Natura 2000 Sites (see Figure 5). In order to get access to Locations A, B and C, two temporary haul roads are required (see Figures 12 and 13). In order to reduce the impact to existing plant life to the south of Location A, a Temporary Engineered Haul Road is required which involves the placing of a layer of pea gravel, terram, aggregate and a top layer of gravel (see Figure 12). This Temporary Engineered Haul Road will require careful removal on completion of the project. In order to reduce the impact to the existing *CM1 – Lower Saltmarsh Habitat* plant life to the south of Locations B and C, a Temporary Haul Road is required (see Figure 13). The route of this haul road has been selected on the basis that it avoids adjacent plant life with just sand and gravel on its surface. No materials are required for this haul road (i.e., it is not engineered). Both of the temporary haul roads, which have been proposed between the site locations and the landward edge of the high tide mark, will also be partially located within Dundalk Bay SAC (see Figures 12 and 13).

The purpose of the screening exercise is to inform the AA process in determining whether the proposed works, alone or in combination with other plans and projects, is likely to have significant effects on the Natura 2000 sites within the study area (and in particular on Dundalk Bay Special Protected Area [004026] and the Dundalk Bay Special Area of Conservation [000455]. If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the AA process must proceed to Stage 2 - Appropriate Assessment and the preparation of a Natura Impact Statement (NIS). Screening has been undertaken for this development in accordance with the European Commission's Guidance on Appropriate Assessment (European Commission, 2001) which comprises the following:

- Description of the Project/Works;
- Identification of Natura 2000 sites potentially affected by the Project/Works;
- Identification and description of individual and cumulative impacts likely to result from the Project/Works;
- Assessment of the significance of the impacts identified on the conservation objectives of the site(s); and

- Exclusion of sites where it can be objectively concluded that there will be no significant impacts on conservation objectives.

Please note that as a result of a European Court of Justice decision, Article 6(3) of Council Directive 92/43/EEC of 21st May, 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site.

Given that the proposed Coastal Protection Works are within Dundalk Bay SPA (004026) and within 4-5m of Dundalk Bay SAC (000455) and given the above ruling, this project is likely to have a significant effect on Natura 2000 sites and as such, the Appropriate Assessment Screening process was not required for this development. As the site is located within a Natura 2000 site, this project automatically triggers the requirement for a Natura Impact Statement. As such, a Natura Impact Statement has been prepared for the proposed Coastal Protection Works at Bellurgan Point as required under European and Irish legislation. A short Appropriate Assessment Screening statement has also been prepared and is included in Appendix 1 of this report.

4 FIELD WORK & REPORTING METHODOLOGY

4.1 Desk Study

A comprehensive GIS mapping and data review was carried out to identify all statutory protected areas and other non-statutory areas within 15km of the site. This involved a review of inland freshwater water ecosystems. All ecological, biological/Q-Index and hydrological/chemical monitoring data available from the websites of NPWS, National Biodiversity Data Centre, Bat Conservation Ireland, Louth C.C., EPA, GSI, OPW and WFD were reviewed. Information on protected species of fauna and flora listed for protection under Annex II of the EU Habitats Directive (92/43/EEC), Annex I of the Birds Directive (79/409/EEC) and the Wildlife (Amendment) Act (2000) will be sought from NPWS, the National Biodiversity Data Centre and published sources were reviewed. The National Parks and Wildlife Service (NPWS) of the Department of Arts, Heritage, Regional Rural and Gaeltacht Affairs database of designated conservation areas and NPWS records of rare and protected plant species were checked with regard to the location of the lands at Bellurgan Point.

The online database hosted by the Irish National Biodiversity Data Centre (NBDC) (www.biodiversityireland.ie) was also utilised to assess the importance of the study area for mammals and bats. Other sources accessed to gather information on bats in the study area included The Bat Conservation Trust's report *'Distribution Atlas of Bats in Britain and Ireland 1980-1999'* (Richardson, 2000). The *'Irish Red Data Book 2: Vertebrates - Threatened Mammals, Birds, Amphibians and Fish in Ireland* (Whilde. 1993) and the updated *Irish Red List No.3: Terrestrial Mammals* (Marnell *et al.* 2009) were also reviewed.

Recent, high resolution, colour aerial photographs were used to identify habitats of conservation value. Relevant mapping was prepared for this NIS through a combination of Autocad Map 2017 and ArcGIS Pro. Ornithological data submitted as part of previous Ecological Impact Assessments, Natura Impact Statements and Appropriate Assessment Screening reports for developments within the vicinity of site were reviewed.

4.2 Unmanned Aerial Vehicle (Drone) Photogrammetry Survey

Mulroy Environmental Ltd. carried out 4K photogrammetric drone survey of the site and the surrounding area on the 22nd June, 2023 and a 4K video survey of the site on the 7th October, 2023. Mulroy Environmental are licensed SOP holders with the Irish Aviation Authority/EASA and have drone specific insurance in addition to our normal Public and Employers Liability Insurance. The site is not in an IAA restricted flight zone and did not require SOP permission from the IAA. The purposes of the drone surveys were to familiarise Mulroy Environmental with the topography and vegetation of the site and to help in the production of drawings for report. Two dimensional orthomosaics were generated for each survey which were used in the production of detailed drawings for the site and in the accurate calculation of habitat area through their use in ArcGIS Survey 123. In addition, a 3D model of the site was produced which assisted in and in the mapping of habitats within the site.

4.3 ArcGIS Pro & Autocad Mapping

GIS maps of different scales were produced using the ArcGIS Pro computer programme. These maps were used to identify the proximity of the site to Special Areas of Conservation (SACs) and Special Protected Areas (SPAs), and to surrounding surface waters. SAC and SPA data was imported from NPWS and added as a layer (NPWS, 2023). Orthomosaics developed through drone photogrammetric surveys were imported into ArcGIS Pro and Autocad 2017 added as a map surface layer. The site boundary was identified and outlined within this map. A 15km buffer was created around a centre point within the site boundary.

4.4 Habitat Survey

A site-based habitat assessment was carried out from the 5th to the 7th September 2023 at each of the proposed coastal works areas Locations A, B and C using a GPS enabled Samsung Galaxy Tab Active 3 All Weather tablet. The habitat survey was also extended to include the area to the southwest of Location A, the area between Locations A and B and also the foreshore area approximately 35m to the east of Location C. The survey was divided into upper and lower areas due to the complex nature of the area. The habitat survey was carried out following the Heritage Council's *Best Practice Guidance (Smith et al., 2011)*. Habitats were classified to Level 3 of the Heritage Council's classification (*Fossitt, 2000*), and also according to the *Habitats Directive types (European Commission, 2013)* where appropriate. In addition to habitat mapping, notes on plant species composition, structure and management were collected. Plant species were assigned a DAFOR abundance rating within each habitat. The DAFOR scale is presented in the following table, Table 1 which was modified from *Smith et al. (2011) Habitat Mapping Guidelines.*

Table 1. DAFOR Abundance Rating

RATING	DESCRIPTION
Dominant (D)	A Dominant species generally covers more than two-thirds of the habitat.
Abundant (A)	Abundant species typically cover between one-third and two-thirds of the habitat. A rule of thumb for evaluating Abundant species is 'everywhere you look you see lots'.
Frequent (F)	Commonly encountered species seen when walking through the habitat. 'Everywhere you look you see some'.
Occasional (O)	Occasional species generally have relatively low frequency and low cover. However, they do not have to be searched for to be found.
Rare (R)	Rare species are those that are only found once or a very few times during the survey, depending on the size of the habitat. Species cover is also very low where Rare species are found.
Locally Abundant (LA)	Used where overall occurrence of species is either occasional or rare, but species is abundant over a small area.

Plant nomenclature follows Stace (2010). Plant species identification was assisted by the PictureThis plant identification application with 98% accuracy (PictureThis, 2023). The identification and

classification of these plants was also assisted by databases provided by the NBDC, the EPA, Teagasc, Biodiversity Ireland and the NPWS.

4.5 Bird Survey

As the site is located within Dundalk Bay SPA, a bird song survey was carried out along the Bellurgan Point shoreline and the road on the 7th September 2023. This survey was carried out using Cornell Lab Merlin Bird ID software application installed on a Samsung Galaxy Tab Active 4 tablet. Three recordings were taken between 13:53 and 15:46 with a total duration of 39 minutes and 57 seconds. A walkover survey was carried out and bird sightings were also noted.

5 EXISTING ENVIRONMENT

5.1 Description of Overall Works Area

Louth County Council wishes to carry out coastal protection works at 3 locations along the foreshore to the east of the Quay at Bellurgan Point, Dundalk, County Louth (see Figures 1-6 and Plate 1 below). Damage has occurred at 3 locations along this sea front with soil erosion and boulders displaced by wave action during storm conditions along the upper foreshore. The three site work areas are referred to as Locations A, B and C (see Figures 7, 8, 11 and 12) and are located directly to the south of a coastal road which runs in a southwest to northeast direction and provides access to Bellurgan Point.

The site works have been split into 3 No. locations; Location A which runs between Chainage 0m and 60m, Location B which runs between Chainage 205m and 220m, and Location C between approximate Chainage 220m and 245m. The proposed coastal protection works at Bellurgan Point are approximately 100m by 3m in total footprint.

Two temporary haul roads, an Engineered Haul Road and a Non-Engineered Haul Road, between 3-5m wide have been proposed between the site boundaries and the high tide mark. This is to allow machinery access to transport materials to and from the works areas and to avoid blocking the adjacent local public road.

To achieve access to Location A, a ramp is proposed extending from the adjacent road to the foreshore to the west of location A. This will allow access to a Temporary Engineered Haul Road which will run along the full length of location A. In order to protect the vegetated shingle and gravel shore areas and minimise disturbance, the Temporary Engineered Haul Road will consist of pea gravel, geotextile terram, overlaid with aggregate and gravel cover.

To achieve access to Locations B and C, a ramp is proposed extending from the adjacent road to the foreshore to the west of Location B where vegetation cover is lowest. This second Temporary Haul Road will not require a protective engineered design as in Location A, as there is little plant life present along its route in comparison.

The route of the 2 proposed temporary haul roads were designed with an aim to limit disturbance of vegetated areas and protected habitats. It is expected that footprint of the *Location A-Temporary Engineered Haul Road* and its use by plant will compact the underlying vegetation during construction and will exclude light for the duration of the project. However, it is expected that the underlying roots for the plants will be viable following the careful removal of the gravel, hardcore, terram and underlying pea gravel. These impacts will be temporary, and the plant life will recover in full in time.

It is expected that the footprint of the *Locations B and C - Temporary Haul Road* will also be compacted. This impact will be temporary, and the area will return to its original condition in time. The

'decompaction' process for both areas will be facilitated by wave action after completion of the project during spring high tides when the former routes will be inundated with water.

5.2 Location A Coastal Works Area

The first location, Location A is located on the western side of the foreshore and is approximately 90m from the eastern side of Bellurgan Point Quay (see Figures 6 and 12 and Plates 3 and 4 below and following). This works area is 60m in length and runs between Chainage 0m and 60m. The area between Chainage 0m to 15m consists of badly damaged stone sea wall which has fallen away with pea gravel fill from an adjacent Telecom Eireann duct visible due to the erosion. A manhole cover for the Telecom Eireann is located on the grass verge at Chainage 12m. It should be noted that no existing coastal protection structure exists between Chainage 15m to 60m at Location A works area. This area shows evidence of soil collapse. To the west of Location A, is located approximately 20m existing stone sea wall which is largely intact.

Plate 3. Aerial photograph taken at 40m elevation taken from seaward facing in a northerly direction towards Location A proposed coastal works area

Plate 4. Two ground photographs taken on the 17th April, 2023 at Chainage 30m facing in an north-westerly direction towards Location A proposed coastal works area showing damaged stone sea wall on the western side and soil collapse in the middle of Location A Works Area

5.3 Location B Coastal Works Area

The 2nd location, Location B is located towards the eastern side of the foreshore, is approximately 15m in length and runs between Chainage 205m and 220m (see Plates 5 and 6 below). This area is characterised by a concrete footing within the road verge that was constructed in 2022 as emergency protection works following a storm event which caused undermining of the local road. However, there are areas under and above this concrete footing which show evidence of collapse (see Figure 13).

Plate 5. Aerial photograph taken at 40m elevation taken from seaward facing in a northerly direction towards Location B proposed coastal works area

Plate 6. Two ground photographs taken on the 7th October, 2023 at Chainage 205m to 220m facing in an north-westerly direction towards Location B proposed coastal works area showing concrete footing with collapsed stone sea wall beneath

5.4 Location C Coastal Works Area

The 3rd location, Location C is located on the eastern side end of the foreshore, is approximately 25m in length and is between Chainage 220m and 245m (see Figure 13 and Plates 7 and 8 below). This area is directly to the east of Location B Proposed Coastal Works area. Location C Works Area requires repair

to the existing stone sea wall which shows evidence of erosion with collapsing and boulders detaching from the sea wall. A manhole cover for the Telecom Eireann is located on the grass verge at Chainage 225m. The original sea wall extends from Chainage 170m for approximately 200m to the east (see Figure 11).

Plate 7. Aerial photograph taken at 40m elevation taken over Location B facing in a north-easterly direction towards Location C proposed coastal works area

Plate 8. Two ground photographs taken on the 7th October, 2023 at Chainage 220m facing in northerly and easterly directions towards Location C proposed coastal works area showing damaged stone sea wall

5.5 Surrounding Property

There are approximately 9 residential properties located within 100m of the proposed works area with residences located directly to the north of Location A Coastal Works Area (see Figures 7 and 8). There are 2 commercial premises within 100m of the site, Bellurgan Precision Engineering and Competition Motors Garage (see Plate 9 below). The Blue Anchor Pub and restaurant is located approximately 170m to the west of the proposed works area. The Anchor Tours Coach and Bus Hire garage and bus parking area is located approximately 205m to the west of the proposed works area and to the north of the Quay (see Plate 10 below). Bellurgan Quay to the west is used locally for tying up small fishing vessels (see Figures 7 and 8 and Plate 11 following).

Plate 9. Aerial photograph taken at 70m elevation to the south of the site facing in a north-easterly direction towards residential and commercial property within 100m of the site works boundary (note Competition Motors on the left and Bellurgan Precision Engineering on right)

Plate 10. Aerial photograph taken at 70m elevation to the south of the Bellurgan Quay facing in a northerly direction towards residential and commercial property to the west of the site (note Anchor Tours Coach and Bus Hire garage on the left and Blue Anchor on right)

Plate 11. Aerial photograph taken at 70m elevation to the west of the site facing in a north-easterly direction at low tide towards Bellurgan Point Quay beds (note small commercial vessel tied up on western side of quay wall)

5.6 Site History

A review of 25-inch historical Ordnance Survey mapping indicates the existence of the current road, some of the current residences and the quay to the south of the village approximately 100 years ago (see following Plate 12). A prominent feature in Bellurgan at that time was the Dundalk to Greenore railway line which ran in a west to east direction and was located to the north and rear of the roadside residences. A number of level crossings are visible on the 25-inch mapping. Evidence of the route of the railway line are clearly visible in current aerial photography e.g., former railway bridge over Flurry River (see Plate 13 below).

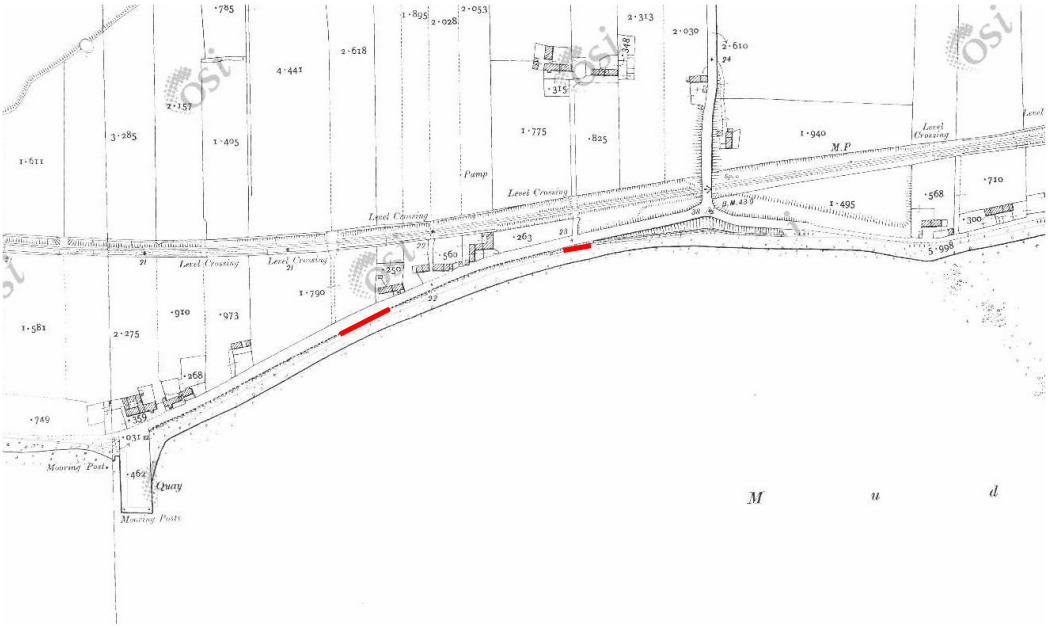


Plate 12. Extract of last Edition of 25-inch historical OS Mapping (note red LINE indicates the approximate locations of the Location A, B and C Coastal Works Area)

Plate 13. Aerial photograph taken at 70m elevation at Bellurgan Quay facing in a north-westerly direction showing the abutments for the former Dundalk to Greenore Railway Bridge

5.7 Topography

The land to the north of the road is relatively flat with the exception of 2 isolated low-lying depressions to the south of the site where groundwater springs may exist. The overall regional topography of the area is characterised by the land closest to the site sloping gently from north to south towards the foreshore (see Plate 14 following and Figures 12 and 13).

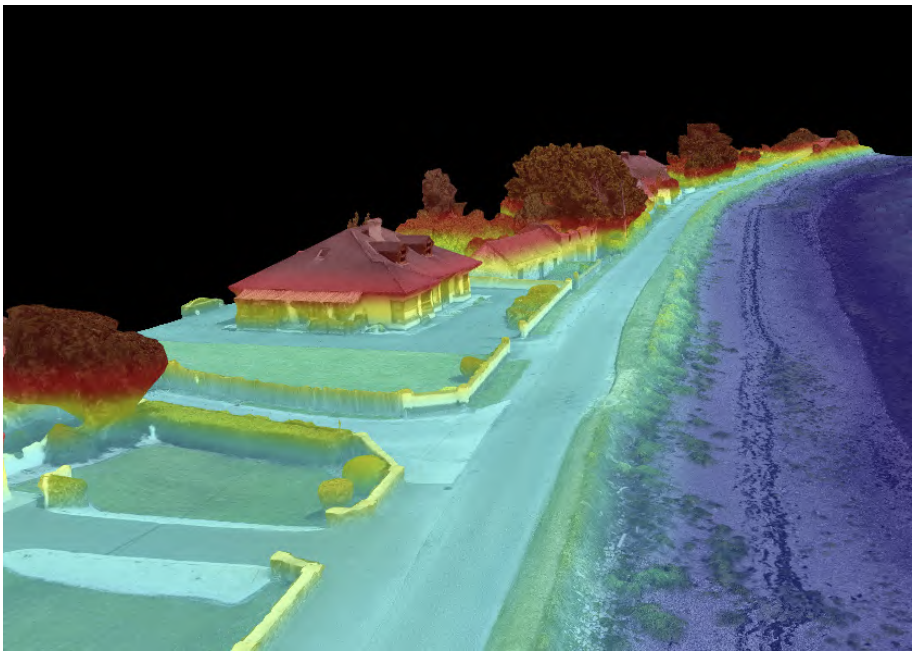


Plate 14. Extract of Dronedeploy 3D Elevation Model

The edge of the road adjacent to Location A Coastal works area has an elevation of 4.37mAOD at Chainage 0 (see proposed works layout in Figures 12). The elevation decreases to 4.03mAOD at Chainage 60.

The elevation then undulates from 4.06m to 4.14mAOD between Chainage 80m to 180m (see Figures 13). At Chainage 200m, the elevation increases to 4.18mAOD at the western end of Location B Coastal Works Area and then increases noticeably to 4.35mAOD at Chainage 220m at the western end of Location C Coastal Works Area. The elevation increases to 4.68mAOD at the eastern end of Location C Coastal Works Area at Chainage 245.

The following plate, Plate 15 shows a section though the Location A Coastal Works Area. The section passes through the residence (i.e., to the north) driveway, the adjacent road, the seawall and down onto the foreshore. As can be seen from the section to the left of Plate 15, the elevation various from approximately 4.24mAOD to 1.24mAOD approximately 60m to the south on the foreshore. The sea wall is an earthen embankment which is approximately 1.65m high standing on the foreshore (see Plate 15 following).

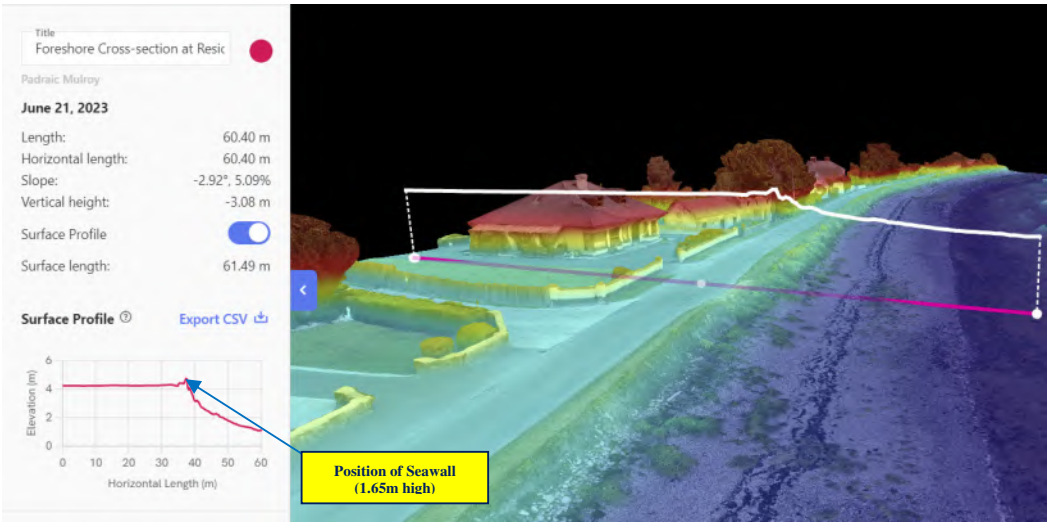


Plate 15. Cross-section through residence, road, sea wall and foreshore prepared using Dronedeploy 3D Elevation Model

5.8 Infrastructure

The wastewater treatment plant for Dundalk is located at Soldier's Point approximately 550m to the southwest of the site across the Castletown Estuary. The discharge from this Wastewater Plant is located at its north-eastern corner which is approximately 480m to the southeast of the proposed coastal protection works.

Plate 16. Aerial photograph taken at Bellurgan Point Quay at 70m elevation facing in a south-westerly direction towards Soldier's Point Wastewater Treatment Plant

5.9 Existing Stormwater Drainage

There are no surface water bodies or land drains within the site or along the perimeter of the 3 works areas. A 10-inch land drainage pipe is located at the Location B Coastal Works area (see Plate 17 below). This pipe accepts surface water runoff from the public road and most likely only discharges onto the foreshore following extensive rainfall during the winter period. There was no evidence of soil erosion and/or channelling beneath the pipe outfall.

Plate 17. Ground photograph taken on the 7th October, 2023 at Chainage 212m facing in an northerly direction towards Location B Coastal Works Area showing land drainage pipe

A stormwater pipe is located on the south-eastern corner of Bellurgan Point Quay outside of the proposed works areas (see Figure 4 and Plate 18 below and Plate 19 following).

Plate 18. Aerial photograph taken at 30m elevation to the southeast of Bellurgan Quay facing in a north-westerly direction showing ponded stormwater from the stormwater outfall

Plate 19. Ground photograph taken on the 6th October, 2023 at southern edge of Bellurgan Quay facing in an easterly direction showing stormwater outfall to southeast of quay

The regional hydrology of the area is discussed in Section 5.7 of the report.

5.10 Closest Designated Protected Sites

It should be noted that the site is approximately 12km to the south of the border with Northern Ireland (see Figures 1, 2 and 3). As part of the appropriate assessment only the potential impact to Special Areas of Conservation and Special Protected Areas (i.e., Natura 2000) sites are assessed. Natural Heritage Areas (i.e., within the Republic of Ireland) and Area of Special Scientific Interests (ASSIs) (i.e., within Northern Ireland) are not regarded as Natura 2000 sites and are not part of this assessment.

As can be seen from Figures 5 and 6, the northern boundary of the Special Protected Area, Dundalk Bay SPA (004026) is demarcated by the sea wall at the southern side of the road. The northern boundary of the Special Area of Conservation, Dundalk Bay SAC (000455) is located on the foreshore approximately 4-5m to the south of the sea wall. As such, the 3 proposed coastal works areas are inside Dundalk Bay SPA (004026) but outside Dundalk Bay SAC (000455) which is located approximately within 4-5m to the south of the southern edge of the proposed works (see Figures 5 and 6). However, the construction of a Temporary Engineered Haul Road along Location A, and the marking out of a second Temporary Haul Road (i.e., on construction materials required) between 3-5m wide along Locations B & C will be required between the site work's southern boundaries and the High-Water Mark (HMW). This would bring the construction works within Dundalk Bay SAC (000455). Another Special Area of Conservation, Carlingford Mountain SAC (000453) (and within the Rep. of Ireland) is located approximately 3km upgradient and to the northeast of the site (see Figures 1 to 3).

5.11 Site Hydrology

5.11.1 Regional Hydrology

The site is located within the Newry, Fane, Glyde and Dee Water Framework Directive (WFD) River Basin District (RBD). The site is in the WFD Subcatchment Sub Big[Louth]_SC_010. Beneath this Subcatchment, the site is located within WFD River Sub Basins Rockmarshall_010 (see Appendix 1 for hydrological desk study information) (see Figures 3 and 4).

The site is located on the northern banks of the Dundalk Bay. The following plate, Plate 20 shows the position of the various transitional waters. As can be seen from Plate 7, the foreshore to the south of the site is classed as being within Inner Dundalk Bay. The Castletown Estuary is located to the west of the site. The Castletown River flows through the town of Dundalk rising near Newtownhamilton, County Armagh, Northern Ireland. It is known as the Creggan River in its upper reaches. Its two main tributaries are the Kilcurry and Falmore rivers. The Ballymascanlan Estuary is located to the northwest of the site. This estuary is fed by the Flurry River.

The Water Framework Directive monitoring programme for 2016-2021 has classed the Inner Dundalk Bay as having *'Moderate'* Ecological Status with *'Moderate Phytoplankton Status'* and *'Good Invertebrate Status'*.

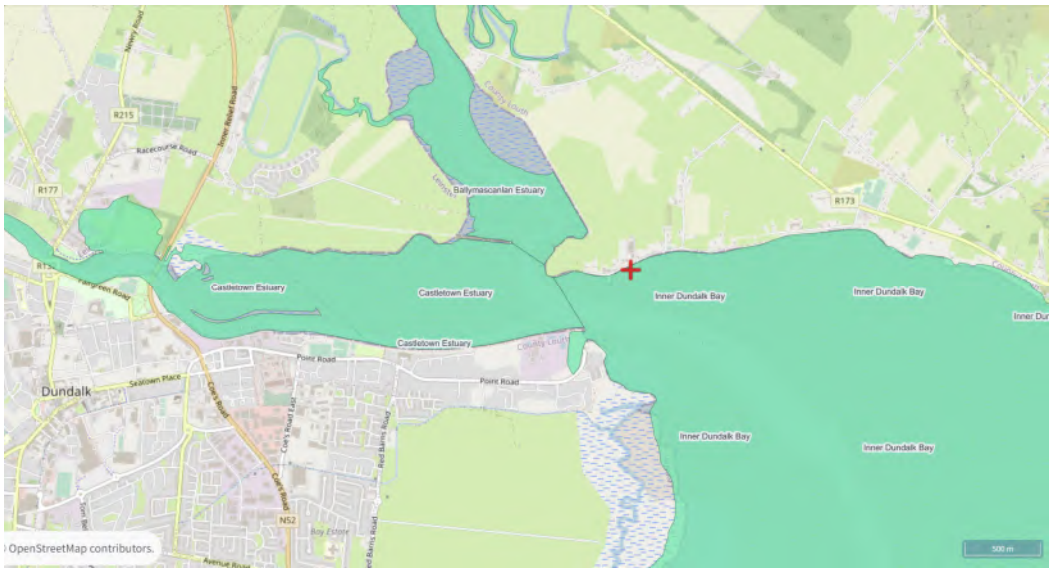


Plate 20. Extract of EPA mapping showing transitional water bodies within Castletown Estuary/Dundalk Bay

The Flurry River's catchment is located within the Neagh Bann International River Basin District and covers an area of approximately 83.5 km2. The Flurry River rises near Newry in Co. Armagh and flows in a southerly direction and feeds into the Castletown River estuary at a location approximately 600m to the west of the site (see Figures 3 and 4).

The closest surface water body is the Bellurgan River which is approximately 480m to the northwest of the site. A small river, the Bellurgan River acts as a tributary to the Flurry River and flows in a northeast to southwest direction. The catchment of the Bellurgan River is relatively small and is located to the north of the site. Land in the area is drained by a network of land drains. A coastal flood protection barrier protects the land to the north of the site from flooding by the Flurry River estuary. A number of land drains feeding into the Bellurgan River at various points approximately 480m to the northwest of the site. The Bellurgan River passes through the afore-mentioned barrier approximately 480m to the northwest of the site.

There are no EPA Q-index water monitoring locations or hydrometric stations on the Bellurgan River.

5.11.2 Local Site Hydrology

As stated previously, there are no surface water bodies or land drains within the works site or along the perimeter of the site. However, there is a stormwater pipe located on the south-eastern corner of Bellurgan Point Quay discharging freshwater onto the foreshore to the south of the quay (see Figure 4 and previous Plates 18 and 19 and Plate 21 below). The freshwater channel from this outfall, which also receives freshwater from a channel flowing from the east, is visible during low tide (see Plate 21 below).

Plate 21. Aerial photograph taken at 70m elevation to the east of Bellurgan Quay facing in a westerly direction showing freshwater channel from the stormwater outfall to main Castletown river channel

The freshwater channels on the foreshore to the south of the works area have been mapped (see Figure 4). As can be seen from Figure 4, there are no channels in the proximity of the works area.

Based on the position of flotsam and drift lines remaining after tidal events, it is likely that the base of the sea wall within the 3 proposed coastal works areas is covered by seawater at spring tides.

As there are no surface water bodies in or on the boundaries of the works site, there are in effect no discharges of stormwater from the site (i.e., there is no connectivity) (see Figures 5 an 6).

5.12 Site Geology

5.12.1 Introduction

This section addresses the soil and geology aspects of the environment and assesses the impacts of the proposed development on the existing soil, subsoil and bedrock environments. This section was prepared following a site audit and desk study work. Relevant documents that were accessed comprised geological maps and publications by the National Soil Survey of Ireland and the Geological Survey of Ireland (GSI).

5.12.2 Soil

5.12.2.1 Soil (Top Horizon)

The formation of topsoil is known as the *'pedogenic'* process. The General Soil Map of Ireland, published by An Foras Talúntais (1980) indicates that the predominant or principal soil type in the Bellurgan area is Soil Association No. 18 with the Principal Soil identified as a *Podzol(70%)* with associated 'Secondary' *soils gleys(20%)* and *peat(10%)*. Reference to the National Soil Map of Ireland (SIS National Soils) published recently and jointly by the EPA and Teagasc indicates that the predominant or principal soil type in the Bellurgan area is Soil Association '*MarSed – Marine/Estuarine Sediments'*. Approximately 300m northwest of the site another soil type found in the Greenore area is that of '*Mesc-Estuarine Silts and Clays'*. The locations of these soil types are indicated on extracts from the EPA maps which can be seen in the Appendix 2. Based on Mulroy Environmental's site-specific observations during the inspection of the foreshore, the general classification for the area is considered appropriate for the site.

5.12.2.2 Subsoil (Quaternary) Geology

The origin of the subsoil material in this region is associated with the movement and deposition from glaciers during the last Ice Age. The ice sheets ground down the underlying bedrock, breaking the rock and grinding it to small sizes ranging from clays to boulders. The powerful erosive force of these ice sheets are considered to have moulded/sculpted the landscape in the area, with glacial features evident in the area. Glacial deposits in the area consist of tills, which were deposited at the base of moving glaciers, and to a lesser extent fluvio-glacial sand and gravels, which were deposited by glacial meltwaters.

The National Soil Mapping Project carried out jointly by the EPA and Teagasc have identified the footprint of the site as subsoil type '*MGs-Marine Gravels & Sands, often raised'* (see Plate 22

following). Approximately 300m to the northwest of the site, near the Ballymascanlan estuary, '*Mesc-Estuarine Silts and Clays'* subsoils are located. To the north of this subsoil, a pocket of *'A-Alluvium'* is located. Land further to the north of the site in more upland areas, is dominated by *'TGr – Till derived from granite)'* (see Appendix 2).

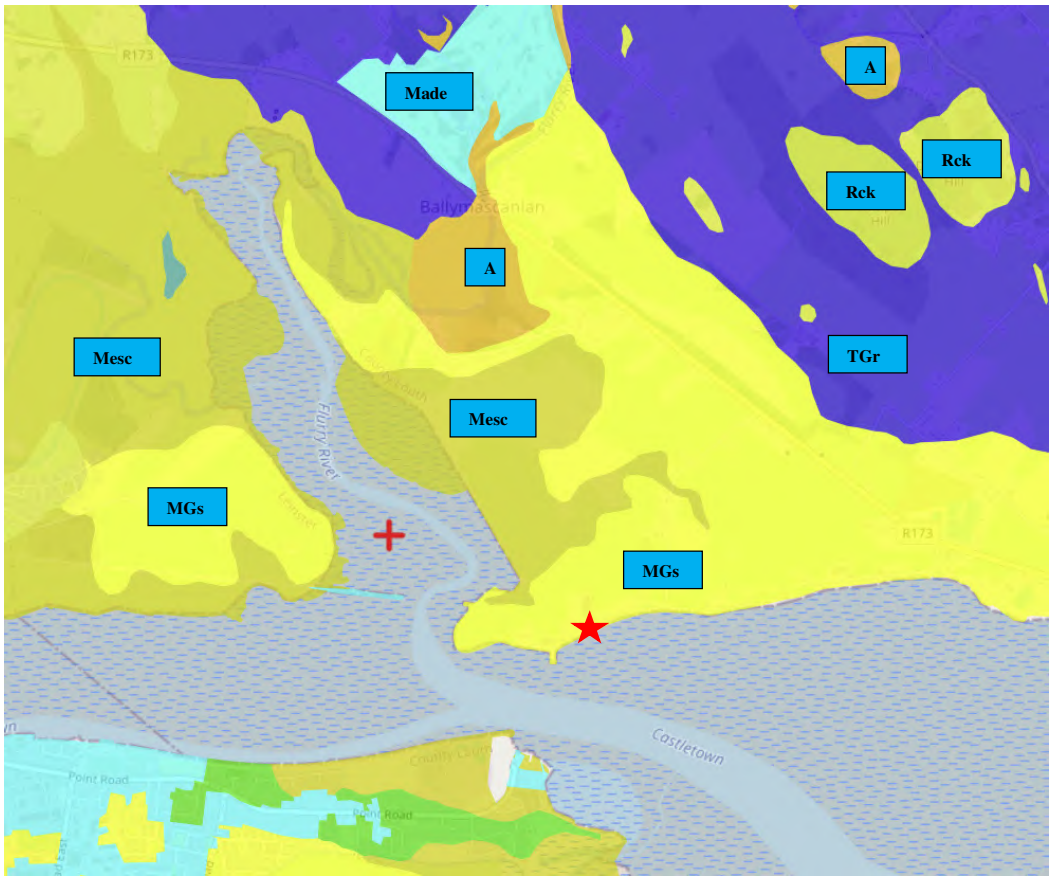


Plate 22. Subsoil mapping for site (from EPA/Teagasc database) (note Red star shows the location of the site)

5.12.2.3 Site Specific Soil & Subsoil Detail

There is no site-specific information available on subsoils underlying or in the vicinity of the site but the subsoils are likely to be marine sands and gravels as detailed by GSI mapping.

5.12.3 Geology

5.12.3.1 Regional Bedrock Geology

According to the GSI Bedrock 1:100,000 scale digital geological map series, the Bedrock formation underlying the site is described as a *'Dinantian Limestones Undifferentiated* (see Appendix 1). A review of GSI geological records within 2km of the site revealed only 1 borehole record. This record was for a monitoring well drilled in the vicinity of the former landfill. No information is provided on the depth to bedrock for this record (see Appendix 2).

5.12.3.2 On-site Bedrock Geology

An inspection of the site did not indicate any bedrock outcrop within the works site or in the general vicinity of the site.

5.12.4 Hydrogeology

5.12.4.1 General Hydrogeological Classification

The GSI have classified the bedrock aquifer underlying the site as *Lg - Locally Important Gravel Aquifer* (see Appendix 1). Locally important gravel aquifers would generally have *'good'* well yields - 100-400 m^3/d.

5.12.4.2 Groundwater Vulnerability

Groundwater vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. The vulnerability category is based on the relative ease with which infiltrating water and potential contaminants may reach groundwater in a vertical or sub-vertical direction. The permeability and thickness of the subsoil, which influences the attenuation capacity, are important elements in determining the vulnerability of groundwater. The Irish GSI has produced guidelines on groundwater vulnerability mapping that aim to represent the intrinsic geological and hydrogeological characteristics that determine how easily groundwater may be contaminated by human activities. Vulnerability depends on the quantity of contaminants that can reach the groundwater, the time taken by water to infiltrate to the water table and the attenuating capacity of the geological deposits through which the water travels. These factors are controlled by the types of subsoils that overlie the groundwater, the way in which the contaminants recharge the geological deposits (whether point or diffuse) and the unsaturated thickness of geological deposits from the point of contaminant discharge. For vulnerability assessments with regard to bedrock aquifers the relevant geological layer is the subsoil between the release point of contaminants and the top of the bedrock. Any unsaturated bedrock layer is not considered as it is assumed that bedrock has little or no attenuation capacity due to its fissure flow characteristics. Groundwater encountered in low permeability glacial tills, or other non-aquifer subsoils, is not considered to be a target. Therefore, where low permeability subsoils overlie the bedrock it is the thickness of subsoil between the release point of contaminants and bedrock that is considered when assessing vulnerability of bedrock aquifers, regardless of whether the low permeability materials are saturated or not.

The site has been given an aquifer vulnerability category rating of High (H) by the GSI (see Plate 23 below and Appendix 1).

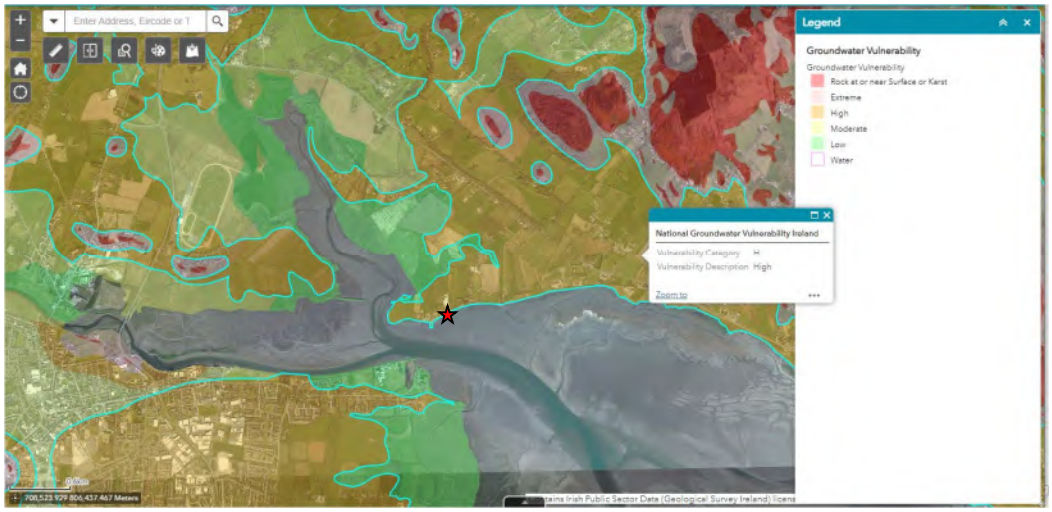


Plate 23. Groundwater vulnerability mapping for the Bellurgan Area (note red star is in the centre of the site and site's vulnerability is 'High')

5.12.4.3 Groundwater Source Protection

The DoE-LG, EPA and GSI guidelines for Groundwater Protection Schemes allow for the combination of aquifer classification and vulnerability rating giving classifications of groundwater protection zones. The purpose of these zones is to place a control on the activities practised within a zone and thus provide protection to any underlying groundwater resources. Using DoE-LG, EPA and GSI criteria and the aquifer classification and vulnerability categories defined for the site, a Lg/H (*'H – High')* would be assigned for the site (see Table 2).

Table 2. Groundwater Vulnerability Mapping Guidelines

Vulnerability rating	High permeability (sand/gravel)	Moderate permeability (sandy till)	Low permeability (clayey subsoil)
Extreme	0 – 3.0m	0-3.0 m	0 – 3.0m
High	>3.0m	3.0-10.0m	3.0 – 5.0m
Moderate	N/A	>10m	5.0 – 10.0m
Low	N/A	N/A	>10.0m

5.12.4.4 Groundwater Quality Status

EPA Water Catchment mapping indicates that the site is on the northern end of the Dundalk Gravels Groundwater Body (IE_NB_G_024). The overall groundwater quality of this body is described as good (see Appendix 1).

5.12.4.5 Hydrogeological Risk from Proposed Coastal Protection Works

Given the nature and scale of the proposed coastal protection works, the risk posed by the proposed works to the underlying aquifer is negligible. Provided that mitigation measures laid out in the Construction Environmental Management Plan (CEMP) are implemented on site with regard to offsite bunded fuel storage (i.e., within the offsite builder's compound) and utilisation of spill kits near the work area, the risk of hydrocarbon spillage and contamination of surface water and/or groundwater will be minimal.

5.13 Site Ecology

5.13.1 On-site Ecology

5.13.1.1 Overview

The site for the proposed coastal protection works is located in Bellurgan Point, County Louth, along a public coastal shore area. The coastal protection works are proposed for an area which is characterised by 2 existing stone sea walls with the remaining sea wall consisting of soil. Over time sections of the stone sea wall and earthen sea wall have been damaged by coastal erosion most likely during storm conditions. These proposed coastal work areas are located in the upper littoral zone of the foreshore (see Figures 12 and 13). The proposed coastal protection works lie between the local public road and the Bellurgan foreshore. The construction of a Temporary Engineered Haul Road along Location A, and the marking out of a second Temporary Haul Road (i.e., on construction materials required) between 3-5m wide along Locations B & C will be required between the site work's southern boundaries and the High-Water Mark (HMW). This would bring the construction works within Dundalk Bay SAC (000455). Two temporary access ramps will also be required immediately west of Locations A and B to allow machinery access to the foreshore via the aforementioned temporary haul roads.

The first stone sea wall, located on the western side of Location A Coastal Works area, is approximately 43m in length. This stone sea wall extends to Chainage 15m at the proposed Location A works area. The second stone sea wall runs the full length of both Locations B and C site works beginning at Chainage 170m and extending for approximately 200m to the east (see Figure 11).

Several residential properties and agricultural fields overlook the shoreline along the road. A quay is located to the southeast of the site locations. The Blue Anchor pub and Anchor Tours Coach and Bus Hire are located to the west of the site, to the North of the pier. Competition Motors and Bellurgan Precision Engineering Ltd. are also located along the country road to the North and northwest of the site locations.

5.13.1.2 Methodology

A site-based habitat assessment was carried out between the 5th and 7th September 2023 at each of the 3 proposed work areas and the adjacent habitats (i.e., to the southeast of site A, the area further northwest between A and B, and the area northwest past location C for approximately 35m). The total survey stretch along the shore was approximately 445 metres in length. The proposed coastal protection works is approximately 100m in length, with the site's footprint approximately 300m² in area. The habitat survey was carried out following the Heritage Council's *Best Practice Guidance (Smith et al., 2011).* Habitats were classified to Level 3 of the Heritage Council's classification (*Fossitt, 2000*), and also according to the *Habitats Directive types (European Commission, 2013)* where appropriate.

Prior to the field survey, a desk study was undertaken to identify habitats through 2D drone photogrammetric survey imagery (i.e., orthomosaics) and 3D modelling. Habitat types and data sets obtained from National Parks and Wildlife Service (NPWS), the National Biodiversity Data Centre (NBDC), the Environmental Protection Agency (EPA), and other sources were employed to assist in the drafting of a habitat map in preparation of the field survey.

In addition to habitat mapping, notes on plant species composition, structure and management were collected. As stated in Section 2 on Methodology, plant species were assigned a DAFOR abundance rating within each habitat. The DAFOR scale is presented in the previous table, Table 1 which was modified from *Smith et al. (2011) Habitat Mapping Guidelines*. Plant nomenclature follows Stace (2010). Plant species identification was assisted by the PictureThis plant identification application with 98% accuracy (PictureThis, 2023). The identification and classification of these plants was also assisted by databases provided by the NBDC, the EPA, Teagasc, Biodiversity Ireland and the NPWS.

Six GIS maps of different scales were produced using the ArcGIS computer programme. These maps were used to identify the proximity of the site to Special Areas of Conservation (SACs) and Special Protected Areas (SPAs), and to surrounding surface waters. SAC and SPA data was imported from NPWS and added as a layer (NPWS, 2023). An orthomosaic developed through a drone photogrammetric survey was imported into ArcGIS Pro and added as a map surface layer. The site boundary was identified and outlined within this map. A 15km buffer was created around a centre point within the site boundary.

It is general practice when screening a plan or project for compliance with the Habitats Directive, to identify all Natura 2000 sites (SPAs & SACs) within the functional area of the plan/project itself and within 15km of the boundaries of the area the plan/project applies to. This approach is currently recommended in the Department of the Environmental, Heritage and Local Government's document *Guidance for Planning Authorities* and as a precautionary measure, to ensure that all potentially affected Natura 2000 sites are included in the screening process.

5.13.1.3 Habitat Descriptions

Eight habitat types were found in the vicinity of the area proposed for the coastal protection works and within the 3 proposed work areas (see Figures 9 to 11). These habitats included: *Sea Walls, Piers and Jetties* (*CC1*), *Buildings and Artificial Surfaces* (*BL3*), *Improved Amenity Grassland* (*GA2*), *Dry Meadows and Grassy Verges* (GS2), *Shingle and Gravel Shore (LS1), Mud Shores (LS4), Lower Salt Marsh (CM1)* and *Scrub (WS1).* The footprint for the proposed coastal protection works area covers approximately 300m^2. Within the site boundaries for the 3 proposed work areas, 4 No. habitat types were identified: *Improved Amenity Grassland* (*GA2*), *Dry Meadows and Grassy Verges* (*GS2*), *Shingle and Gravel Shore (LS1)* and *Sea Walls, Piers and Jetties* (*CC1*). The site locations are categorised as both *Sea Walls, Piers and Jetties* (*CC1*) and *Shingle and Gravel Shore (LS1)* habitat. The site locations are bordered by *Improved Amenity Grassland* (*GA2*) and *Dry Meadows and Grassy Verges* (*GS2*) habitats immediately north and northwest between the shore and the road (BL3). A proportion of these

habitats are located within the site location in some areas. A *Mud Shore (LS4)* habitat is located to the northeastern direction further down the shore.

Sea Walls, Piers, and Jetties (CC1)

This habitat category includes coastal constructions that are partially or fully submerged at high tide, or subject to sea splash or wave action (see Figures 9 to 11). This includes sea walls, piers, jetties, slipways, causeways, and other marine structures either in rural or urban areas. Artificial structures which are exposed at low tide are also included, such as: coastal defences or groynes, wrecks, and pipes or pipelines. Both natural and artificial building materials such as rock, cement, metal, wood, or plastic are commonly used. If plant or animal communities are present in the littoral and sublittoral zones of sea walls, piers, and jetties, they are typically similar to those of natural rocky substrata described in the marine section of the classification. The existing concrete coastal protection wall within the site location falls under this CC1 category, along with the other existing stone and concrete sea walls which form a boundary between coastal and terrestrial habitats along the upper shore. As outlined previously, two concrete coastal protection sea walls are present, one within site location A, and a second within both locations B and C (see Plate 24). The first of these two sea walls begins southwest of Location A site works and extends approximately 43m to Chainage 15m. The second sea wall begins at Chainage 170m and continues past Locations B and C work areas eastwards along the coast for approximately 200m.

The proposed works include replacing existing structures at Locations A and B with rock armour and repairing the existing stone sea wall at Location C works area. Varying patches of vegetation can be seen along the existing sea wall structures throughout all 3 locations. The species found along this CC1 habitat are listed in Table 3. It should be noted that an earthen sea wall exists between Chainage 20m and 60m at Location A.

Plate 24. Ground photograph taken to the south of Location B works area facing in a north-easterly direction showing stone sea wall along Locations B and C work areas (i.e., *Sea Walls, Piers, and Jetties (CC1)* habitat)

Shingle and Gravel Shores (LS1)

Accumulations of shingle and gravel (i.e., mostly 4-256mm in diameter) were noted along the semi-exposed shoreline along with occasional shell fragments (see Figures 9 to 11). This band of shingle and gravel is itself divided between an upper stretch above the high-water mark, which is vegetated, and a lower stretch which is primarily composed of bare stones, cobbles, etc. This shingle and gravel shore habitat is located along the existing coastal protection structures and the GA2 and GS2 habitats throughout the site location. A strandline runs along the entirety of the upper shore above the high tide mark, comprised of predominantly dead and dried out brown seaweed species. Shingle beaches are particularly well represented in Dundalk Bay, occurring more or less continuously from Salterstown to Lurgan White House in the south bay, and from Jenkinstown to east of Gyles Quay in the north bay. The LS1 shore in Bellurgan is heavily vegetated and supports a range of plant species, as listed in Table 4. Lower saltmarsh habitat (CM1), as described below, occurs in dense patches along the mid to lower shore. Bands of seaweed dominated with channel wrack (*Pelvetia canaliculata*) evident towards the lower shore along the seaward edge of this lower saltmarsh habitat (CM1) (see Table 5). Fragmented bands of ephemeral green seaweeds (*Ulva* spp.*& Cladophora* spp.) were also noted towards the lower edge of this shore (see Table 5).

Stretches of vegetation also occur along the upper shore which contain species such as narrow-leaved saltbush (*Atriplex littoralis*), triangle orache (*Atriplex prostrata*), sea beet (*Beta vulgaris*), sea radish

TABLE 3. NATURE CONSERVATION SITES WITHIN 15 KM OF PROPOSED COASTAL PROTECTION WORKS, BELLURGAN POINT, DUNDALK, CO. LOUTH (INFORMATION OBTAINED FROM WWW.NPWS.IE IN & WWW.DAERA-NI.GOV.UK IN SEPTEMBER 2023)

SITE NAME, SITE CODE, DISTANCE AND DIRECTION FROM SITE	SITE OR ORGANISM NAME AND/OR CODE GIVEN ACCORDING TO INTERPRETATION MANUAL OF EUROPEAN UNION HABITATS	THE POTENTIAL SOURCE-PATHWAY-RECEPTOR LINKS BETWEEN THE WORKS LOCATION AND THE ECOLOGICALLY DESIGNATED SITE
SPECIAL AREAS OF CONSERVATION (SACS)		
Dundalk Bay SAC [000455] 3-4m (S)	▪ [1130] Estuaries ▪ [1220] Perennial vegetation of stony banks ▪ [1410] Mediterranean salt meadows (*Juncetalia maritimi*) ▪ [1310] *Salicornia* and other annuals colonizing mud and sand ▪ [1140] Mudflats and sandflats not covered by seawater at low tide ▪ [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) Source: *NPWS. (2011). Conservation Objectives: Dundalk Bay SAC [000455]. Version 1.0. Department of Culture, Heritage and the Gaeltacht.*	Any impacts would be regarded as short-term and just during the Construction Phase. The works area in the vicinity of the Locations A, B and C need to be fenced off prior to the commencement of construction works under the supervision of an appointed Ecological Clerk of Works to minimise any potential impact on those areas adjacent to it that have Annex 1 1220 habitat plant species. If the contractor's machinery (i.e., excavator, dumper, etc) is required to access the foreshore for the delivery of materials to the works area, a temporary haul road should be constructed along the lower foreshore within the LS1 Habitat where plant life is minimal to avoid damage to the *CM1-Lower Salt Marsh* areas. No traffic should be permitted on the wider foreshore during the construction works. The highest risk posed to the foreshore is calcite runoff from concrete used in the repair to the stone sea wall in Location C. This runoff, if not controlled, may come in contact with seawater at high tide and/or heavy rainfall creating calcite contaminated stormwater which will run onto the foreshore. Daily monitoring of works by an Ecological Clerk of Works is required during the construction stage. A site-specific Construction Environmental Management Plan (CEMP) needs to be drawn up by the applicant, approved by the EcOW, and then reviewed and accepted by the appointed contractor Provided mitigation measures are put in place, damage to any Annex 1. 1220 and 1330 habitat plant species and any contamination of the foreshore and the water body itself is unlikely e.g., construction during suitable tidal conditions, correct placement of spillage booms, etc.
Carlingford Mountain SAC [000453] 2.99 km (NE) (Rep. of Ireland)	▪ [4060] Alpine and Boreal heaths ▪ [4030] European dry heaths ▪ [8110] Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) ▪ [8210] Calcareous rocky slopes with chasmophytic vegetation ▪ [8220] Siliceous rocky slopes with chasmophytic vegetation ▪ [4010] Northern Atlantic wet heaths with *Erica tetralix* ▪ [6230] Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) ▪ [7140] Transition mires and quaking bogs ▪ [7230] Alkaline fens Source: *NPWS. (2018). Conservation Objectives for Carlingford Mountain SAC [000453]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.*	Due to distance and the absence of any hydrological or other potential impact pathways between the proposed development and the European site, there are no potential ecological impacts.

TABLE 3. NATURE CONSERVATION SITES WITHIN 15 KM OF PROPOSED COASTAL PROTECTION WORKS, BELLURGAN POINT, DUNDALK, CO. LOUTH (INFORMATION OBTAINED FROM WWW.NPWS.IE IN & WWW.DAERA-NI.GOV.UK IN SEPTEMBER 2023) (CONTINUED)

SITE NAME, SITE CODE, DISTANCE AND DIRECTION FROM SITE	SITE OR ORGANISM NAME AND/OR CODE GIVEN ACCORDING TO INTERPRETATION MANUAL OF EUROPEAN UNION HABITATS	THE POTENTIAL SOURCE-PATHWAY-RECEPTOR LINKS BETWEEN THE WORKS LOCATIONAND THE ECOLOGICALLY DESIGNATED SITE
SPECIAL AREAS OF CONSERVATION (SAC)		
Carlingford Shore SAC [002306] 9.46 km (NE)	▪ [1210] Annual vegetation of drift lines ▪ [1220] Perennial vegetation of stony banks Source: *NPWS. (2013). Conservation Objectives: Carlingford Shore SAC [002306]. Version 1.0. National Parks and Wildlife Service Department of Culture, Heritage and the Gaeltacht.*	Due to distance and the absence of any hydrological or other potential impact pathways between the proposed development and the European site, there are no potential ecological impacts.
Slieve Gullion SAC [UK 0030277] 10.41km (NNW) (Northern Ireland)	▪ [4030] European dry heaths ▪ [4010] Northern Atlantic wet heaths with *Erica tetralix* ▪ [7130] Blanket bogs ▪ [7140] Transition mires and quaking bogs Source: http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030277	Due to distance and the absence of any hydrological or other potential impact pathways between the proposed development and the European site, there are no potential ecological impacts.
Rostrevor Wood SAC [UK 0030268] 11.98 km (NE) (Northern Ireland)	European interest(s): 1. Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles for which this is considered to be one of the best areas in the United Kingdom. Source: *NIEA. (2014). Rostrevor Wood SAC Conservation Objectives. Version 2.0. Department of Agriculture, Environment and Rural Affairs.*	Due to distance and the absence of any hydrological or other potential impact pathways between the proposed development and the European site, there are no potential ecological impacts.

TABLE 3. NATURE CONSERVATION SITES WITHIN 15 KM OF PROPOSED COASTAL PROTECTION WORKS, BELLURGAN POINT, DUNDALK, CO. LOUTH (INFORMATION OBTAINED FROM WWW.NPWS.IE IN & WWW.DAERA-NI.GOV.UK IN SEPTEMBER 2023) (CONTINUED)

SITE NAME, SITE CODE, DISTANCE AND DIRECTION FROM SITE	SITE OR ORGANISM NAME AND/OR CODE GIVEN ACCORDING TO INTERPRETATION MANUAL OF EUROPEAN UNION HABITATS	THE POTENTIAL SOURCE-PATHWAY-RECEPTOR LINKS BETWEEN THE WORKS LOCATION AND THE ECOLOGICALLY DESIGNATED SITE
Special Protection Areas (SPA)		
Dundalk Bay SPA [004026] 0m (S)	▪ Curlew (*Numenius arquata*)* ▪ Redshank (*Tringa totanus*)* ▪ Black-Headed Gull (*Chroicocephalus ridibundus*)* ▪ Common Gull (*Larus canus*)* ▪ Herring Gull (*Larus argentatus*)* ▪ Great Crested Grebe (*Podiceps cristatus*)* ▪ Greylag Goose (*Anser anser*)* ▪ Light-Bellied Brent Goose (*Branta berniclahrota*)* ▪ Pintail (*Anas acuta*)* ▪ Common Scoter (*Melanitta nigra*)* ▪ Red-Breasted Merganser (*Mergus serrator*)* ▪ Oystercatcher (*Haematopus ostralegus*)* ▪ Ringed Plover (*Charadrius hiaticula*)* ▪ Golden Plover (*Pluvialis apricaria*)* ▪ Grey Plover (*Pluvialis squatarola*)* ▪ Lapwing (*Vanellus vanellus*)* ▪ Knot (*Calidris canutus*)* ▪ Dunlin (*Calidris alpina*)* ▪ Black-Tailed Godwit (*Limosa limosa*)* ▪ Bar-Tailed Godwit (*Limosa lapponica*)* ▪ Shelduck (*Tadorna tadorna*)* ▪ Teal (*Anas crecca*)* ▪ Mallard (*Anas platyrhynchos*)* ▪ Wetlands & Waterbirds [A999] * denotes wintering birds at Dundalk Bay. Source: NPWS. (2011). *Conservation Objectives: Dundalk Bay SPA [004026].* Version 1.0. Department of Culture, Heritage and the Gaeltacht.	Any impacts would be regarded as short-term and just during the Construction Phase. The works area in the vicinity of the Locations A, B and C need to be fenced off prior to the commencement of construction works under the supervision of an appointed Ecological Clerk of Works to minimise any potential impact on those areas adjacent to it that have Annex 1 1220 habitat plant species. If the contractor's machinery (i.e., excavator, dumper, etc) is required to access the foreshore for the delivery of materials to the works area, a temporary haul road should be constructed along the lower foreshore within the LS1 Habitat where plant life is minimal to avoid damage to the *CM1- Lower Salt Marsh* areas. No traffic should be permitted on the wider foreshore during the construction works. The highest risk posed to the foreshore is calcite runoff from concrete used in the repair to the stone sea wall in Location C. This runoff, if not controlled, may come in contact with seawater at high tide and/or heavy rainfall creating calcite contaminated stormwater which will run onto the foreshore. Daily monitoring of works by an Ecological Clerk of Works is required during the construction stage. A site-specific Construction Environmental Management Plan (CEMP) needs to be drawn up by the applicant, approved by the EcOW, and then reviewed and accepted by the appointed contractor Provided mitigation measures are put in place, damage to any Annex 1. 1220 and 1330 habitat plant species and any contamination of the foreshore and the water body itself is unlikely e.g., construction during suitable tidal conditions, correct placement of spillage booms, etc.
Carlingford Lough SPA [004078] 10.9 km (ENE) (Rep. of Ireland)	▪ Light-Bellied Brent Goose (*Branta bernicla hrota*)* ▪ Wetlands & Waterbirds [A999] * denotes wintering birds at Dundalk Bay. <u>Source:</u> *NPWS. (2011). Conservation Objectives: Carlingford Lough SPA [004078] Version 1.0. Department of Culture, Heritage and the Gaeltacht.*	Due to distance and the absence of any hydrogeological, hydrological or other potential impact pathways between the proposed development and the European site, there are no potential ecological impacts.

TABLE 3. NATURE CONSERVATION SITES WITHIN 15 KM OF PROPOSED COASTAL PROTECTION WORKS, BELLURGAN POINT, DUNDALK, CO. LOUTH (INFORMATION OBTAINED FROM WWW.NPWS.IE IN & WWW.DAERA-NI.GOV.UK IN SEPTEMBER 2023) (CONTINUED)

SITE NAME, SITE CODE, DISTANCE AND DIRECTION FROM SITE	SITE OR ORGANISM NAME AND/OR CODE GIVEN ACCORDING TO INTERPRETATION MANUAL OF EUROPEAN UNION HABITATS	THE POTENTIAL SOURCE-PATHWAY-RECEPTOR LINKS BETWEEN THE WORKS LOCATION AND THE ECOLOGICALLY DESIGNATED SITE
Special Protection Areas (SPA)		
Carlingford Lough SPA [UK9020161] 12.22 km (ENE) (Northern Ireland)	SPA SELECTION FEATURES ▪ Light-Bellied Brent Goose (*Branta berniclahrota*)* ▪ Common Tern (*Sterna hirundo*)* ▪ Sandwich Tern *(Thalasseus sandvicensis)** ADDITIONAL ASSI SELECTION FEATURES ▪ Great Crested Grebe (*Podiceps cristatus*)* ▪ Shelduck (*Tadorna tadorna*)* ▪ Scaup (*Aythya marila*)* ▪ Red-Breasted Merganser (*Mergus serrator*)* ▪ Oystercatcher (*Haematopus ostralegus*)* ▪ Dunlin (*Calidris alpina*)* ▪ Redshank (*Tringa totanus*)* <u>Source:</u> *NIEA Carlingford Lough Special Protection Area (SAP) UK9020160. Conservation Objectives – Including Conservation Objectives for Carlingford Lough ASSI*	Due to distance and the absence of any hydrogeological, hydrological or other potential impact pathways between the proposed development and the European site, there are no potential ecological impacts.
Stabannan-Braganstown SPA [004091] 14.87 km (SSW)	▪ Greylag Goose *(Anser anser)* ** denotes breeding birds at Stabannan-Braganstown. Source: NPWS. (2022). *Conservation Objectives: Stabannan-Braganstown SPA [004091].* Version 1.0. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.	Due to distance and the absence of any hydrological or other potential impact pathways between the proposed development and the European site, there are no potential ecological impacts.

(*Raphanus raphanistrum*) and sea mayweed (*Tripleurospermum maritimum*) (see Table 4). The stretch of vegetation between approximately Chainage 20m and 160m (i.e., from within Location A to c. 40m from the southwest of Location B) includes plant species growing within stony banks along the upper shore above the high tide mark. These species conform to the Annex I (Habitats Directive) habitat ***'[1220] Perennial vegetation of stony banks'***, with the presence of sea sandwort (*Honckenya peploides*), curled dock (*Rumex crispus*), sea beet (*Beta vulgaris* ssp. *maritima*), sea mayweed (*Tripleurospermum maritimum)*, sea radish (*Raphanus raphanistrum* ssp. *maritimus*) and lyme grass (*Leymus arenarius*) (see Plates 25 and 26 following). The width of this habitat varies along the shore. This habitat also occurs to the southwest of Location A site works. This Annex I habitat type has been listed as a designated priority habitats within the conservation objectives for Dundalk Bay SAC [000455]. Plant species found within the LS1 shore have been listed in Table 4. Coastal dry grassy verges (GS2) and improved amenity grassland (GA2) occur above this habitat along the road. A portion of this habitat, between Chainage 20m and 60m, will require removal to facilitate the construction of the rock armour at Location A. The construction of a Temporary Engineered Haul Road along Location A, and the marking out of a second Temporary Haul Road (i.e., on construction materials required) between 3-5m wide along Locations B & C will be required between the site work's southern boundaries and the High-Water Mark (HMW). Two access ramps will also be required to the immediate west of Locations A and B. These temporary works will be constructed along the *LS1-Shingle and Gravel Shore* habitat, largely in areas of unvegetated shingle. To protect areas of ***'[1220] Perennial vegetation of stony banks'*** along Location A, a Temporary Engineered Haul Road is required which involves the placing of a layer of pea gravel, terram, aggregate and a top layer of gravel (see Figure 12). This will aim to prevent habitat loss and offer protection from compaction caused by large machinery. This Temporary Engineered Haul Road will require carefully removal on completion of the project. Due to the lack of vegetation along Locations B and C, this second temporary haul road will not require the construction of a protective overlay.

Plate 25. Annex I (Habitats Directive) habitat '[*1220] Perennial vegetation of stony banks*' located along the upper stretch of the shore between Chainage 20m and 40m within proposed Location A Works Area

Plate 26. Annex I (Habitats Directive) habitat '[*1220] Perennial vegetation of stony banks*' located along the upper stretch of the shore between Chainage 40m and 70m marks within and to the northeast of Location A Works Area

Table 4. Plant Species identified in *CC1 – Sea walls, Piers Jetties Habitat* at Proposed Coastal Protection Works Site at Bellurgan Point, County Louth

Common Name	Taxon Name	Native/Alien/Invasive	Irish Status	Invasive Impact Score	DAFOR
Sea beet	*Beta vulgaris*	Native	Not protected	N/A	F
Tansy ragwort	*Jacobaea vulgaris*	Native	Not protected	N/A	O
Common nipplewort	*Lapsana communis*	Native	Not protected	N/A	O
Birdeye speedwell	*Veronica persica*	Alien	Established	Not assessed	O
Common bird's-foot trefoil	*Lotus corniculatus*	Native	Not protected	N/A	F
Sea mayweed	*Tripleurospermum maritimum*	Native	Not protected	N/A	O
Curly dock	*Rumex crispus*	Native	Not protected	N/A	F
Red fescue	*Festuca rubra*	Native	Not protected	N/A	A
Sea radish	*Raphanus raphanistrum*	Native	Not protected	N/A	F
Perennial sowthistle	*Sonchus arvensis*	Native	Not protected	N/A	F
Wild carrot	*Daucus carota*	Native	Not protected	N/A	F
Sea sandwort	*Honckenya peploides*	Native	Not protected	N/A	F
Triangle orache	*Atriplex prostrata*	Native	Not protected	N/A	F
Rock samphire	*Crithmum maritimum*	Native	Not protected	N/A	F
Sea aster	*Tripolium pannonicum*	Native	Not protected	N/A	F
Wavy hair grass	*Avenella flexuosa*	Native	Not protected	N/A	F
Creeping buttercup	*Ranunculus repens*	Native	Not protected	N/A	O
Sea plantain	*Plantago maritima*	Native	Not protected	N/A	O

Table 5. Plant Species identified in *LS1 – Shingle and Gravel Shores Habitat* at Proposed Coastal Protection Works Site at Bellurgan Point, County Louth

Common Name	Taxon Name	Native/Alien/Invasive	Irish Status	Invasive Impact Score	DAFOR
Triangle orache	*Atriplex prostrata*	Native	Not protected	N/A	F
Sea beet	*Beta vulgaris*	Native	Not protected	N/A	F
Curly dock	*Rumex crispus*	Native	Not protected	N/A	F
Perennial sowthistle	*Sonchus arvensis*	Native	Not protected	N/A	F
Sea radish	*Raphanus raphanistrum*	Native	Not protected	N/A	F
Sea mayweed	*Tripleurospermum maritimum*	Native	Not protected	N/A	A
Wild carrot	*Daucus carota*	Native	Not protected	N/A	F
Bush grass	*Calamagrostis epigejos*	Alien	Protected	Not assessed	F
Stinging nettle	*Urtica dioica*	Native	Not protected	N/A	O
Lyme grass	*Leymus arenarius*	Native	Not protected	N/A	F
Wavy hair grass	*Avenella flexuosa*	Native	Not protected	N/A	F
Creeping thistle	*Cirsium arvense*	Native	Not protected	N/A	O
Tufted bulrush	*Trichophorum cespitosum*	Native	Not protected	N/A	O
Perennial ryegrass	*Lolium perenne*	Native	Not protected	N/A	F
Narrow-leaved saltbush	*Atriplex littoralis*	Native	Not protected	N/A	F
Sea sandwort	*Honckenya peploides*	Native	Not protected	N/A	F
European beach grass	*Ammophila arenaria*	Native	Not protected	N/A	F
Common bird's-foot trefoil	*Lotus corniculatus*	Native	Not protected	N/A	O
Common velvet grass	*Holcus lanatus*	Native	Not protected	N/A	O
Orchard grass	*Dactylis glomerata*	Native	Not protected	N/A	F
Red fescue	*Festuca rubra*	Native	Not protected	N/A	F
Pink sorrel	*Oxalis articulata*	Alien	Established	N/A	R

Dry Meadows and Grassy Verges (GS2)

Dry meadows and grassy verges are rarely fertilized, mowed or grazed upon by livestock (see Figures 9 to 11). This type of grassland is usually visible on grassy roadside verges, on the margins of tilled fields, on railway embankments, in churchyards and cemeteries, and in some neglected fields or gardens. A wide range of grass and broadleaved herb species were recorded along the road, which begins at Chainage 75m and continued northeast for approximately 188 metres. This GS2 habitat forms a boundary between locations B and C and the road. A high percentage of tall, coarse dry grassland species such as orchard grass (*Dactylis glomerata*), bush grass (*Calamagrostis epigejos*) and false oatgrass (*Arrhenatherum elatius*) were recorded. There were abundances of narrow leaved grasses including wavy hair grass (*Avenella flexuosa*) and red fescue (*Festuca rubra*). Other grass species included creeping bent (Agrostis stolonifera) and perennial ryegrass (Lolium perenne). Bush-grass (*Calamagrostis epigejos)*, orchard grass (*Dactylis glomerata*) and lyme grass (*Leymus arenarius*) were the dominant grass species in this habitat. Common broadleaved herbs encountered include ribwort plantain (*Plantago lanceolata*), creeping cinquefoil (*Potentilla reptans*), White clover (Trifolium repens), common bird's-foot trefoil (*Lotus corniculatus*), cow parsnip (*Heracleum sphondylium*), wild carrot (*Daucus carota),* nettle (*Urtica dioica*) and common knapweed (*Centaurea nigra*). The full list of recorded species can be seen in Table 6.

Lower Salt Marsh (CM1)

Lower salt marsh consists of dense strands of halophytes, which are subject to more prolonged submersion by seawater in comparison to upper salt marsh. The salt marsh at Bellurgan Point is located across the middle of the shingle (LS1) shore in fragmented patches which widens to the southeast of the Location C works area to a more continuous, extensive distribution (see Figures 9 to 11 and Plates 27 & 28). The species composition across each area is identical, with laterally varying abundances of individual species. Saltmarsh habitats can be categorised by distinct zones of vegetation, which is apparent in Bellurgan Point, particularly to the eastern area of the shore. The vegetation in this habitat is comprised of both annual and perennial species such as sea lavender (*Limonium humile*), sea plantain (*Plantago maritima*), sea purslane (*Atriplex portulacoides*) and seashore aster (*Tripolium pannonicum*). These species listed are typically found between the mid shore and areas further inland. Sea lavender (*Limonium humile*), sea purslane (*Atriplex portulacoides*) and seashore aster (*Tripolium pannonicum*) are particularly abundant across all areas. Coastal salt marsh grass species recorded included red fescue (*Festuca rubra*), European beach grass (*Ammophila arenaria*) and sea arrowgrass (*Triglochin maritima*). The species found within this habitat have been listed in Table 7. Red fescue (*F. rubra*) is particularly abundant towards the upper half of the marsh in most areas. Quantities of annual seablite (*Suaeda maritima*) and glassworts (*Salicornia* spp.) are common throughout the saltmarsh but appear more conspicuous to the extremes; either further inland or lower towards the seaward region. The wider area of saltmarsh to the southeast of Location C is dominated by monocultural swards of common cordgrass (*Spartina anglica*) at the seaward edge between the shingle and mud shores (see Plate 27). This habitat continues East along the coast over a substantial area.

Plate 26. Ground photograph taken to the south of Location C Works Area facing in an easterly direction showing Lower salt marsh (CM1) Annex I habitat (Habitats Directive) '*[1330] Atlantic salt meadows'* across the middle of the shingle (LS1) shore in fragmented patches.

First reported in Ireland in 1925, *S. anglica* is an invasive alien plant species (IAPS) of High Impact (Invasive Score 18) (NBDC, 2023). This is a coastal perennial species with tall stems which reproduce rapidly in intertidal and estuarine mudflat habitats to form monocultural swards. As they grow, they enable sediment stabilisation, limit wave action, and heighten saltmarsh elevation levels. As such, they were initially planted for coastal protection and land remediation purposes (Hammond, M. & Cooper, A., 2002). *S. anglica* originated as a result of chromosome doubling by the sterile hybrid *Spartina x townsendii* (Hammond, M. & Cooper, A., 2002). They can reproduce via seedlings, underground rhizomes, or vegetative propagation. Dense swards of common cordgrass invade important intertidal and saltmarsh habitats as they can spread vigorously due to their rapid growth and prevent light penetration to low-lying halophilic species. They have been found to reduce the occurrence and biodiversity of significant mixed saltmarsh habitats, *Zostera* beds and other Annex I (Habitats Directive) habitats in coastal areas, which provide important habitats for bird populations. The lack of competition in mudflats also allows this species to expand into unvegetated areas. As *S. anglica* swards encroach into these areas, they also prevent wildfowl and wading bird species' access to invertebrates in the sediment (Hammond, M. & Cooper, A., 2002). Increases in *S. anglica* cover is considered unfavourable in intertidal habitats. *S. anglica* is a Third Schedule listed species subject to restrictions under Regulations 49 & 50 in the European Communities (Birds and Natural Habitats) Regulations 2011 (Regulation 50 is not yet in effect). In Northern Ireland, this species is listed as a schedule 9 species under Articles 15 & 15A of the 1985 Wildlife Order. During construction, preventative measures should be put in place to conserve the biodiversity along the shore. Invasive species may be spread by machinery or equipment on site through directly transferring propagules, or due to the presence of propagules on equipment or machinery which may be introduced when they are used in

another area of a site. To prevent this, equipment or machinery which has been in contact with invasive flora must be cleaned to remove invasive debris. Invasive species' propagules may also exist within the sediment; therefore, sediment should not be transferred to another area or site. A site and species-specific invasive management plan should be put in place prior to commencement of works.

The lower saltmarsh habitat in Bellurgan Point is consistent with the Annex I habitat (Habitats Directive) ***'[1330] Atlantic salt meadows'***. This habitat can be classified by distinct zones which relate to elevation and submergence factors. The seaward edge of this habitat is categorised with the presence of glassworts (*Salicornia* spp.), annual seablite (*Suaeda maritima*), lax-flowered sea-lavender (*Limonium humile*) and the invasive common cordgrass (*Spartina anglica*). The mid-marsh areas generally host species such as thrift (*Armeria maritima*) and/or sea plantain (*Plantago maritima*). This zone is generally transitional to an upper marsh herbaceous community with red fescue (*Festuca rubra*). This description corresponds with the Bellurgan Point saltmarsh areas (see Plate 27). This Annex I habitat type has been listed as a designated priority habitat within the conservation objectives for Dundalk Bay SAC [000455]. This habitat is not located within the site location and should not be directly impacted by site works, although a sufficient buffer should be put in place to protect these areas during construction. The Temporary Engineered Haul Road along location A and the Temporary Haul Road along Locations B and C on the *LS1-Shingle and Gravel Shore* has not been predicted to impact valuable lower salt marsh ***'[1330] Atlantic salt meadows'*** habitat. Areas of this habitat will be carefully demarcated and fenced off prior to construction, and care will be taken to avoid vegetated areas to prevent habitat loss or damage.

Plate 27. Ground photograph taken to the south of Location C Works Area facing in an easterly direction showing the Lower salt marsh (CM1) Annex I habitat (Habitats Directive) *'[1330] Atlantic salt meadows'* to the east of Location C Works Area

Improved Amenity Grassland (GA2)

This habitat category includes improved grassland areas, excluding farmland, which are usually species poor and regularly managed and mowed to maintain short swards (see Figures 9 to 11). They are rarely grazed by livestock. This category includes grassland areas in gardens, parks, grounds of various buildings or institutions, golf course fairways, grassy sports fields, and racecourses. Improved grassland habitats were identified in the surrounding areas. These areas were largely utilised as gardens outside of residential properties. However, a strip of mown grass is also located along the verge of the road southwest of Location A works area for approximately 623m until it ends at Chainage 75m (see Figure 9). The grass species along this strip included mown swards of red fescue (*Festuca rubra*), annual bluegrass (*Poa annua*), perennial ryegrass (*Lolium perenne*), and broadleaved herbs such as dandelion (*Taraxacum officinale*), white clover (*Trifolium repens*), ribwort plantain (*Plantago lanceolata*), perennial sowthistle (*Sonchus arvensis*), dove's-foot crane's-bill (*Geranium mole*), wild radish (*Raphanus raphanistrum*), creeping buttercup (*Ranunculus repens*), smooth hawksbeard (*Crepis capillaris*), wild carrot (*Daucus carota*) and sea beet (*Beta vulgaris*).

Mud Shores (LS4)

Mud shores are shores which are composed of very fine sediment with at least 30% silt and/or clay (particle sizes of <0.063 mm in diameter) components. These areas can include sandy muds (with 20-70% sand and 30-80% silt/clay) or soft mud shores (>80% silt/clay) that can be found in the upper reaches of estuaries. Some of these habitats can be subject to variable salinity conditions. The lower middle to lower shore at Bellurgan Point can be classified as a soft mud shore due to a high percentage of silt and clay and the presence of shallow channels further outland (see Figures 9 to 11 and Plate 28). This intertidal mud habitat, alongside sandflats, continues into Dundalk Bay and surrounding areas for up to 4,000 hectares. Bellurgan point is located at the mouth of Dundalk Bay, which is fed by freshwater sources from the Castletown River in Dundalk and the Flurry River at Ballymascanlon. As such, it is expected that the area is subject to low to variable salinity conditions. Some oligochaete worms may be present in the sediment as a result. Other faunal communities likely include polychaete worms (*Hediste diversicolor,* Lugworm *Arenicola marina* casts (EcoServe) *Nephtys hombergii, Pygospio elegans*), bivalve molluscs (*Macoma balthica, Scrobicularia plana, Cerastoderma edule, Mya arenaria*), mud snails (*Hydrobia* spp.) and amphipod crustaceans (*Corophium* spp.). Dense swards of cordgrasses (*Spartina* spp.) at the edge of the mud shore indicate lower saltmarsh habitat as outlined below. Although seaweed cover is sparse throughout this habitat, there is some cover of predominantly *Fucoid* spp. at the upper edge. This seaweed community includes spiralled wrack (*Fucus spiralis*), bladder wrack (*Fucus vesiculosus*) and serrated wrack (*Fucus serratus*) (see Table 5). Towards the open sea, this habitat is composed of bare mud.

The mud shores are continuous with the Annex I habitat (Habitats Directive) ***'[1140] Tidal Mudflats and Sandflats Not Covered by Seawater at Low Tide'.*** The mudflats at Bellurgan Point are finely packed fine sediments enabling anoxic conditions in underlying sediments (see Plates 28 and 29). These habitats are typically devoid of vascular plants; but they support algal communities and beds of *Zostera* spp. They are of particular importance as feeding grounds for wildfowl and waders. No *Zostera*

Table 6. Plant Species identified in *GS2- Dry Meadows and Grassy Verges* Habitat at Foreshore to the Northwest of Proposed Coastal Protection Works Site at Bellurgan Point

Common Name	Taxon Name	Native/Alien/Invasive	Irish Status	Invasive Impact Score	DAFOR
Orchard grass	*Dactylis glomerata*	Native	Not protected	N/A	D
False oat grass	*Arrhenatherum elatius*	Native	Not protected	N/A	A
Bush grass	*Calamagrostis epigejos*	Alien	Protected	Not assessed	D
Lyme grass	*Leymus arenarius*	Native	Not protected	N/A	A
Red fescue	*Festuca rubra*	Native	Not protected	N/A	F
Common bird's-foot trefoil	*Lotus corniculatus*	Native	Not protected	N/A	
Perennial sowthistle	*Sonchus arvensis*	Native	Not protected	N/A	F
Stinging nettle	*Urtica dioica*	Native	Not protected	N/A	O
Sea Beet	*Beta vulgaris*	Native	Not protected	N/A	F
Sea radish	*Raphanus raphanistrum*	Native	Not protected	N/A	F
Perennial ryegrass	*Lolium perenne*	Native	Not protected	N/A	F
Wild carrot	*Daucus carota*	Native	Not protected	N/A	F
Meadow buttercup	*Ranunculus acris*	Native	Not protected	N/A	O
Ribwort plantain	*Plantago lanceolata*	Native	Not protected	N/A	F
Creeping bent	*Agrostis stolonifera*	Native	Not protected	N/A	F
Common vetch	*Vicia sativa*	Alien	Not protected	Not assessed	O
Cow parsnip	*Heracleum sphondylium*	Native	Not protected	N/A	O
Smooth hawksbeard	*Crepis capillaris*	Native	Not protected	N/A	O
Curly dock	*Rumex crispus*	Native	Not protected	N/A	F
Creeping cinquefoil	*Potenilla reptans*	Native	Not protected	N/A	R
Sea mayweed	*Tripleurospermum maritimum*	Native	Not protected	N/A	F
Tansy ragwort	*Jacobaea vulgaris*	Native	Not protected	N/A	R
White clover	*Trifolium repens*	Native	Not protected	N/A	O
Common yarrow	*Achillea millefolium*	Native	Not protected	N/A	F
Reed canary grass	*Phalaris arundinacea*	Native	Not protected	N/A	F
Common plantain	*Plantago major*	Native	Not protected	N/A	O
Elmleaf blackberry	*Rubus ulmifolius*	Native	Not protected	N/A	O
Creeping buttercup	*Ranunculus repens*	Native	Not protected	N/A	O
Wavy hair grass	*Avenella flexuosa*	Native	Not protected	N/A	F
Common velvet grass	*Holcus lanatus*	Native	Not protected	N/A	O
Lesser knapweed	*Centaurea nigra*	Native	Not protected	N/A	O

Table 7. Plant Species identified in *CM1-Lower Saltmarsh* Habitat at Foreshore to the Southeast of Proposed Coastal Protection Works Site at Bellurgan Point, County Louth

Common Name	Taxon Name	Native/Alien/Invasive	Irish Status	Invasive Impact Score	DAFOR
Prostrate knotweed	*Polygonum aviculare*	Native	Not protected	N/A	F
Sea lavender	*Limonium humile*	Native	Not protected	N/A	A
Red fescue	*Festuca rubra*	Native	Not protected	N/A	A
Annual seablite	*Suaeda maritima*	Native	Not protected	N/A	F
Seashore aster	*Tripolium pannonicum*	Native	Not protected	N/A	F
Sea purslane	*Atriplex portulacoides*	Native	Not protected	N/A	A
Sea plantain	*Plantago maritima*	Native	Not protected	N/A	F
European beach grass	*Ammophila arenaria*	Native	Not protected	N/A	A
Glassworts	*Salicornia* spp.	Native	*S. perennis*	N/A	F
Triangle orache	*Atriplex prostrata*	Native	Not protected	N/A	O
Sea beet	*Beta vulgaris*	Native	Not protected	N/A	O
Sea arrowgrass	*Triglochin maritima*	Native	Not protected	N/A	A
Common cordgrass	*Spartina anglica*	Invasive	Established	High 18	D
Narrow-leaved saltbush	*Atriplex littoralis*	Native	Not protected	N/A	O
Lesser sea spurrey	*Spergularia marina*	Native	Not protected	N/A	O

beds were recorded during the habitat survey. This Annex I habitat type has been listed as a designated priority habitats within the conservation objectives for Dundalk Bay SAC [000455]. This habitat is not located within the site or construction area, and therefore, this habitat will not be directly impacted by construction.

Plate 28. Ground photo of mud shore (LS4) located southeast of the site location along the lower shore which is continuous with the Annex I habitat '*[1140] Tidal Mudflats Not Covered by Seawater at Low Tide*'.

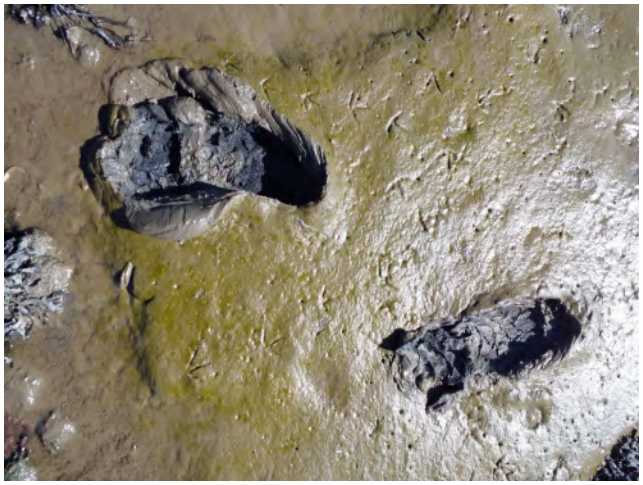


Plate 29. The composition of the mud shore (LS4) located southeast of the site location along the lower shore, with underlying anaerobic conditions (note bird tracks and possible worm holes)

Scrub (WS1)

Scrub is defined as areas that are dominated by at least 50% cover of shrubs, stunted trees or brambles. The canopy height is generally less than 5m, or 4m in the case of wetland areas. The scrub identified is within the adjacent area, is located along the road to the northeast of Location C Works area (see Figures 9 to 11). The vegetation in this area is wider than 4 metres and is dense and impenetrable. A number of scrub species were recorded, including gorse (*Ulex europaeus*), hawthorn (*Crataegus monogyna*), ivy (*Hedera helix*), wild radish (*Raphanus raphanistrum*), elmleaf blackberry (*Rubus ulmifolius*) etc. The most dominant species across the habitat was the native blackberry *Rubus ulmifolius*.

Buildings and Artificial Surfaces (BL3)

This category includes all buildings and structures located offshore which are composed of artificial structures such as cement, bricks, and tarmac. The access road and a number of residential properties fall under this category (see Figures 9-11).

Table 8. Seaweed Species identified at Foreshore to the Southeast of Proposed Coastal Protection Works Site at Bellurgan Point, County Louth

Common Name	Taxon Name	Group
Bladder wrack	*Fucus vesiculosus*	Brown
Serrated wrack	*Fucus serratus*	Brown
Sea lettuce	*Ulva* spp.	Green
Green branched weeds	*Cladophora* spp.	Green
Spiraled wrack	*Fucus spiralis*	Brown
Egg wrack	*Ascophyllum nodosum*	Brown
Gut weed	*Ulva intestinalis*	Green
Channel wrack	*Pelvetia canaliculata*	Brown
Sugar kelp	*Saccharina latissima*	Brown
Wrack siphon weed	*Vertebrata lanosa*	Red
Twisted siphon weed	*Verbebrata nigra*	Red

5.13.1.4 Bird Survey

During the site assessment, no physical evidence of bird nests was observed within the boundary of the 3 site works at Locations A, B and/or C or in the surrounding area. The species recorded during the dawn bird song survey on the 7th September 2023 with Cornell Lab Merlin Bird ID software are as follows:

- Black-headed Gull (*Larus ridibundus*);
- Eurasian Oystercatcher (*Haematopus ostralegus*);
- Rook (*Corvus frugilegus*);
- Barn Swallow (*Hirundo rustica*);
- Eurasian Curlew (*Numenius arquata*);
- Common Redshank (*Tringa totanus*);
- Common Greenshank (*Tringa nebularia*);
- Northern Pintail (*Anas acuta*);
- European Robin (*Erithacus rubecula*);
- Whimbrel (*Numenius phaeopus*); and
- Common Buzzard (*Buteo buteo*).

Bird sightings in the area were also recorded. Several bird species were spotted foraging along the shore or flying in the vicinity and are listed below:

- European starling (*Sturnus vulgaris*);
- Eurasian magpie (*Pica pica*);
- Rook (*Corvus frugilegus*);
- Barn swallow (*Hirundo rustica*);
- Eurasian curlew (*Numenius arquata*);
- Common redshank (*Tringa totanus*);
- Common wood pigeon (*Columba palumbus*); &
- Black-headed Gull (*Larus ridibundus*).

A summary of the bird species surveyed and their status in Ireland can be seen in Table 8. Most of the birds recorded above are common resident birds which are widespread across Ireland. Most species listed above have also been allocated a *green* conservation status in Ireland as per the Birds of Conservation Concern in Ireland 2020-2026 traffic light system list (Colhoun & Cummins, 2013). However, the black headed gull (*L. ridibundus*), barn swallow (*H. rustica)*, northern pintail (*A. acuta*) and the European starling (*S. vulgaris*) have been assigned an '*amber'* status. The Eurasian curlew (*H. rustica*), Eurasian oystercatcher (*N. arquata*), and the common redshank (*T. tetanus*) have been designated a *red* conservation status. Amber list species are of medium conservation concern, while red list species are of high conservation concern in Ireland. The common wood pigeon (*C. palumbus*) is categorised as an Annex I species of the Birds Directive (Directive 2009/147/EC), as outlined in the Official Journal of the European Union. For Annex I species, special conservation measures are

required to protect their habitat and ensure their survival and reproduction within their distribution. In Ireland, all bird species are protected by Irish National legislation under the Wildlife Act 1976.

Dundalk Bay SPA [004026] overlaps with the site location. Of the birds encountered during the bird survey, the following species have been included as Qualifying Interests (QIs) for Dundalk Bay SPA [004026]:

- Black-headed Gull (*Chroicocephalus ridibundus*) [A179];
- Oystercatcher *(Haematopus ostralegus*) [A130];
- Curlew (*Numenius arquata*) [A160];
- Redshank (*Tringa totanus*) [A162]; and
- Pintail (*Anas acuta*) [A054].

As such, the favourable condition of these species and their habitat must be maintained under the conservation objectives for Dundalk Bay SPA. Each of these species are wintering birds which utilise the habitats located along the coast to forage and roost. Intertidal mud, sand flats, and sheltered and shallow subtidal habitats support these species. The saltmarsh habitat also provides important roosting and foraging habitat for many waterbird species including *H. ostralegus, N. arquata* and *T. totanus.*

Although not recorded in the bird survey above, the coast at Bellurgan Point provides foraging and roosting opportunities for light bellied brent geese (*Branta bernicla hrota*). *B. bernicla hrota* are migratory wintering birds and have been listed QI species for Dundalk Bay SPA [004026]. This species winter in Ireland, usually between October and March, and return to breed in northeast Canada via Greenland and Iceland (NIEA, 2023). They typically inhabit farmland, wetland, marine and intertidal habitats. Their distribution is highly reliant on the availability of intertidal Eelgrass (*Zostera* spp.) beds; however, they will also feed on algal blooms and agricultural or amenity grassland. According to surveys carried out by the NPWS, 162 No. light bellied brent geese have been recorded roosting in the saltmarsh habitat along Bellurgan Point and further northeast along the Bellurgan-Jenkinstown saltmarsh. Here, they feed on the salt marsh grasses, as well as on areas of green algae along the mudflats. Colonies of brent geese have been observed night-roosting in areas along Dundalk Bay and day-roosting in Carlingford Lough at high tide. They have been recorded following an 18-24km commuting route between these areas along the coast, while they avoid flying over land. They feed on Zostera beds in Carlingford Lough and may land to graze on green algae (*Ulva* spp.) throughout their commute or when Zostera beds are not available.

The only migratory birds listed above that have been recorded breeding is the barn swallow (*Hirundo rustica*). They are a common summer visitor between March to September. They construct bowl shaped nests from mud, twigs, and other debris. They may source some of this material along the coast. They tend to build nests under bridges, cliffs, outside buildings or on rafters inside some buildings. In September they return to winter in southern Africa. To do so, they migrate across western France, the Mediterranean Sea, and then across the Sahara Desert and the Congo rainforest.

Table 9. Bird Species identified at Proposed Coastal Protection Works Site, Bellurgan Point, County Louth during the Bird Survey on the 7th September, 2023

Common Name	Scientific Name	Resident status	Irish Red List Status	Conservation Status	Wintering	Breeding
Black headed gull	*Larus ridibundus*	Resident	Amber	Annex II B	Yes	Common
Eurasian oystercatcher	*Haematopus ostralegus*	Resident	Red	Annex II B	Yes	Yes
Rook	*Corvus frugilegus*	Resident	Green	Annex II B	Yes	Yes
Barn swallow	*Hirundo rustica*	Breeding	Amber	N/A	No	Yes
Eurasian curlew	*Numenius arquata*	Not resident	Red	Annex II B	Yes	Occasional
Common redshank	*Tringa totanus*	Resident	Red	Annex II B	Yes	Occasional
Common greenshank	*Tringa nebularia*	Not resident	Green	Annex II B	Yes	Occasional
Northern pintail	*Anas acuta*	Wintering	Amber	Annex II A & B	Yes	Rare
European robin	*Erithacus rubecula*	Resident	Green	N/A	Yes	Yes
Whimbrel	*Numenius phaeopus*	Passage migrant	Green	Annex II B	Occasional	No
Common buzzard	*Buteo buteo*	Resident	Green	N/A	Yes	Yes
European starling	*Sturnus vulgaris*	Resident	Amber	Annex II B	Yes	Yes
Eurasian magpie	*Pica pica*	Resident	Green	Annex II B	Yes	Yes
Common wood pigeon	*Columba palumbus*	Resident	Green	Annex II A, Annex III A, Annex I	Yes	Yes

The NBDC database was examined as a part of a desk study. No birds were recorded within the site location during the *'Birds of Ireland'* survey, which is ongoing and has been carried out since 2011. However, a red knot (*Calidris canutus*) was recorded in proximity to the site in grid J091083 during the survey. This is a wintering bird from northern Greenland and the Queen Elizabeth Islands of high Arctic Canada west to Prince Patrick Island which visits between October and February. *C. canutus* has a red conservation status and as such, is of high conservation concern in Ireland (Colhoun & Cummins, 2013). No bird species were recorded in the area as a part of the Irish Wetland Birds Survey (I-WeBS) which covers sightings from September 1994 to March 2001. The site location is spread across two 1km grid reference squares, J0908 and J0808. Of bird species that have not been mentioned above, the common pheasant (*Phasianus colchicus*) has been recorded in this area during the Birds of Ireland survey. This is a resident game bird species which is ranked with a green conservation status in Ireland. It is also an Annex II part A and an Annex III part A species in the EU Birds Directive (Directive 2009/147/EC).

There will be potential bird habitat alteration due to the replacement of a portion of LS1 vegetation for the proposed rock armour installation between Chainage 20m and 60m marks withinin Location A Works area. This portion of the site includes areas of Annex I habitat **'[*1220] Perennial vegetation of stony banks*'**, as mentioned above. Vegetated shingle can provide feeding and nesting habitats for birds such as the oystercatcher. However, no evidence of nesting or feeding was noted in this habitat during the bird survey. Moreover, due to the proximity of these habitats to the road, partial existing vegetation damage due to the dumping of waste lawn grass, and the fragmentation caused by the existing stone sea walls, the negative impacts may be lessened. No damage to the saltmarsh habitat, which is an important habitat for waterbird species, is predicted once mitigation measures are in place.

The foreshore is also located to the east of the Blue Anchor pub and restaurant, Anchor Tours coach service and workshop, and a quay used by small fishing vessels. It should be noted that the gravel area on the quay is used extensively for parking by customers of the Blue Anchor pub and restaurant and as a turning area for buses. Local businesses, Competition Motors and Bellurgan Precision Engineering Limited are located to the northwest and north of the foreshore with customers and workers daily commuting to and from the area. Bellurgan Point shore is frequented by walkers, dogs with people engaging in recreational activity. Boats are also moored on the foreshore.

It is likely that birds in this area have become habituated to these everyday disturbances. Other birds may choose to feed and/or nest in areas of more extensive vegetation and more significant habitats further within Dundalk Bay, or along the coast to the east of the site. The proposed works may slightly increase these disturbance impacts, most notably via noise pollution and increased human presence. To minimise disturbance of migratory bird species, particularly those listed as qualifying interests for Dundalk Bay SPA, any works which include altering the habitat or clearing an area should take place outside of the wintering period between September and March.

5.13.1.5 Mammal Survey

During the site assessment, no sightings or physical evidence of mammal activity was found. The NBDC database was also examined as part of the desk study. No mammals were recorded within the proposed works area during the *Mammals of Ireland 2016-2025 Survey*. However, a harbour seal (*Phoca vitulina*) was recorded to the southwest of the quay to the southwest of the site (grid reference J083081). The species records dataset for the 1km grid reference square which the site is located within was also analysed. The site location is spread within the 1km grid references J0908 and J0808. The harbour seal (*Phoca vitulina*) was the only mammal recorded within grid reference J0808 as above. A colony of harbour seals have been recorded in Dundalk Bay, with 21 seals recorded in the area in 2012 (Duck, C. & Morris, C. (2012)). They are more commonly recorded throughout Carlingford Lough, which supports up to 60 individuals (Burrows, 2011; Duck, C. & Morris, C. (2012)). Harbour seals spend the majority of their time on land, and on the mudflats off the coast of Bellurgan Point and within Dundalk Bay. These areas serve as ideal terrestrial haul-out sites for breeding, resting, social interactions, moulting or for rearing young (Ó Cadhla et al., 2013). They are most vulnerable during breeding or moulting periods at haul-out sites between June and September (RPS, 2013). During the winter, they spend more time foraging in open water areas, typically within 5km of haul-out sites. As such, harbour seals are generally local foragers. In contrast, the other breeding seal species in Ireland, grey seals, forage across a greater distribution and may occasionally visit the area from Carlingford Lough. Irish seals are designated Annex II and Annex V species under the EC Habitats Directive (92/43/EEC), and their conservation requires the designation of Special Areas of Conservation (SACs). All marine mammals are strictly protected as part of Irish legislation under the Wildlife Acts 1976 to 2012. Harbour seals are resident in Ireland; and as they spend much of their time on land, they have been included in the Irish species' *Red List No. 12 for Terrestrial Mammals* as species of Least Concern (LC) (NPWS, 2019). No sightings of this species were recorded while on site.

The red fox (*Vulpes vulpes*) and west European hedgehog (Erinaceus europaeus) were the only mammals recorded within the 1km grid reference J0908. The red fox was recorded during the Mammals of Ireland 2016-2025 survey, which is currently ongoing, while the hedgehog was recorded during the *Hedgehogs of Ireland Survey* (carried out between 2018 to present). Both of these species were recorded as roadkill further inland at the R173 main road. The west European hedgehog (E. europaeus) is protected under the Wildlife Acts 1976 to 2012. The red fox is not currently protected in Ireland. Both species are of Least Concern (LC) in the Irish species' *Red List No. 12 for Terrestrial Mammals* (NPWS, 2019). No mammals have been listed as Qualifying Interests (QIs) within Dundalk Bay SAC [000455].

6 NATURA 2000 SITES

Natura 2000 Designated sites within 15km of the proposed development (i.e., in the Rep. of Ireland and in Northern Ireland) are shown at various scales in Figures 1 to 6. The documentation published by the NIEA and the NPWS (Site Synopsis, Qualifying Interests, etc) for the most important of these sites are located in Appendix 3. The previous table, Table 9 outlines the qualifying interests for each site and identifies whether there are any potential source-pathway-receptor links via which adverse effects to the sites' qualifying interests and conservation objectives could potentially occur. This is vital to identify any potential adverse effects from the proposed development on the qualifying interests of these European sites, or cumulatively with other developments, that may result. Where a potential source-pathway- receptor link is present, an assessment is made as to whether there is a likelihood of significant adverse effects based on a review of the sites qualifying interests and conservation objectives.

As stated previously, the northern boundary of the Special Protected Area, Dundalk Bay SPA (004026) is demarcated by the sea wall at the southern side of the road. The northern boundary of the Special Area of Conservation, Dundalk Bay SAC (000455) is located on the foreshore along the high tide mark approximately 7m to the south of the sea wall. As such, the 3 proposed coastal works areas are inside Dundalk Bay SPA (004026) but outside Dundalk Bay SAC (000455) which is located approximately 3-4m to the south of the southern edge of the proposed works (see Figures 5 and 6).

In the Republic of Ireland, there are 3 Special Areas of Conservation (SACs) within 15km of the site. As stated, the coastal works site is located within 5m of the northern boundary of Dundalk Bay SAC (000455) (see Figures 5 & 6). The other two SACs are Carlingford Mountain SAC (000453) which is 2.99km upgradient and to the northeast of the site, and Carlingford Shore SAC (002306) which is 9.46km to the east of the site (see Table 9 and Figures 1 & 2).

In Northern Ireland, there is a Special Area of Conservation (SAC), Slieve Gullion SAC [UK 0030277] which is 11.98km to the north-northwest of the site and another SAC, Rostrevor Wood SAC [UK 0030268] which is 12.83km to the northeast of the site (see Table 9).

In the Republic of Ireland, there are 3 Special Protected Areas within 15km of the site locations. Other than Dundalk Bay SPA (004026), there is Carlingford Lough SPA (004078), which is 10.9km east-northeast from the site, and Stabannan-Braganstown SPA (004091), which is 14.87km south-southwest of the site (see Table 9 and Figures 1 & 2).

In Northern Ireland, there is one Special Protection Area, Carlingford Lough SPA [UK9020161] which is 12.22km east-northeast from the site (see Table 9 and Figures 1 & 2).

As stated previously, as part of the appropriate assessment process only the potential impact to Special Areas of Conservation and Special Protected Areas (i.e., Natura 2000) sites are assessed. Natural Heritage Areas (i.e., within the Republic of Ireland) and Area of Special Scientific Interests (ASSIs) (i.e., within Northern Ireland) are not regarded as Natura 2000 sites and are not part of this assessment. In Northern Ireland, Areas of Special Scientific Interest are, although important are protected at a lower level. Likewise, Natural Heritage Areas (NHAs) in the Republic of Ireland are not afforded the same levels of protection as Special Protection Areas (SPAs) or Special Areas of Conservation (SACs) (see Table 9).

Of the 9 sites located within 15km of the Proposed Coastal Protection Works site, 2 No. potential '*source-pathway-receptor linkages'* are present, Dundalk Bay SPA (004026) and Dundalk Bay SAC (000455) (see Figures 1 to 6). The proposed coastal protection works site are located within the boundary of this SPA, and within 5m of Dundalk Bay SAC (see Figures 5 & 6).

The Site Synopsis and the Qualifying Interests for Dundalk Bay Special Protection Area (SPA) (004026) are also located in Appendix 2. The Conservation Objectives for Dundalk Bay Special Protection Area (SPA) (004026) can be summarised as follows:

Objectives:

To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for Dundalk Bay SPA:

- A005 Great Crested Grebe *Podiceps cristatus*
- A043 Greylag Goose *Anser anser*
- A046 Light-bellied Brent Goose *Branta bernicla hrota*
- A048 Shelduck *Tadorna tadorna*
- A052 Teal *Anas crecca*
- A053 Mallard *Anas platyrhynchos*
- A054 Pintail *Anas acuta*
- A065 Common Scoter *Melanitta nigra*
- A069 Red-breasted Merganser *Mergus serrator*
- A130 Oystercatcher *Haematopus ostralegus*
- A137 Ringed Plover *Charadrius hiaticula*
- A140 Golden Plover *Pluvialis apricaria*
- A141 Grey Plover *Pluvialis squatarola*
- A142 Lapwing *Vanellus vanellus*
- A143 Knot *Calidris canutus*
- A149 Dunlin *Calidris alpina*
- A156 Black-tailed Godwit *Limosa limosa*
- A157 Bar-tailed Godwit *Limosa lapponica*
- A160 Curlew *Numenius* arquata
- A162 Redshank *Tringa totanus*
- A179 Black-headed Gull *Chroicocephalus ridibundus*
- A182 Common Gull *Larus canus*
- A184 Herring Gull *Larus argentatus*
- A999 Wetlands & Waterbirds

The attributes and targets for the above are presented in the following 3 pages.

Objective 1:

To maintain the favourable conservation condition of Great Crested Grebe, Greylag Goose, Light-bellied Brent Goose, Shelduck, Teal, Mallard, Pintail, Red-breasted Merganser, Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, and of Redshank in Dundalk Bay SPA

This objective is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

Objective 2:

To maintain the favourable conservation condition of Common Scoter, Black-headed Gull, Common Gull and of Herring Gull in Dundalk Bay SPA

This objective is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment using (Generalised Additive Modelling (GAM)) could not be undertaken for this species due to an incomplete dataset. A measure of population change was calculated using the 'generic threshold' method. See Section 4 of the SPA conservation objectives supporting document for more details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

Objective 3:

[A999] Wetland and Waterbirds - To maintain the favourable conservation condition of the wetland habitat in Carlingford Lough SPA as a resource for the regularly occurring migratory waterbirds that utilise it

This objective is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat is stable and not significantly less than the areas of 8136, 4374 and 649 hectares respectively for subtidal, intertidal, and supratidal habitats, other than that occurring from natural patterns of variation. See map 6	As defined by SPA boundary to MLWM; MLWM to MHWM; and MHWM to SPA boundary (the latter value is minus the area of Lurgangreen Fields)

The Site Synopsis and the Qualifying Interests for Dundalk Bay Special Area of Conservation (SAC) (000455) are located in Appendix 2. The six Conservation Objectives for Dundalk Bay Special Area of Conservation (SAC) (000455) can be summarised as follows:

Objective 1:
[1130] Estuaries - To maintain the favourable conservation condition of Estuaries in Dundalk Bay SAC

Objective 2:
[1140] Mudflats and sandflats not covered by seawater at low tide - To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide at Dundalk Bay SAC

Objective 3:
[1220] Perennial vegetation of stony banks - To maintain the favourable conservation condition of Perennial vegetation of stony banks in Dundalk Bay SAC

Objective 4:
[1310] Salicornia and other annuals colonizing mud and sand – To restore the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in Dundalk Bay SAC

Objective 5:
[1330] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) - To maintain the favourable conservation condition of Atlantic salt meadows in Dundalk Bay SAC

Objective 6:
[1410] Mediterranean salt meadows (Juncetalia maritimi) - To maintain the favourable conservation condition of Mediterranean salt meadows in Dundalk Bay SAC

The attributes and targets for the above are presented in the following 6 pages.

Objective 1: [1130] Estuaries - To maintain the favourable conservation condition of Estuaries in Dundalk Bay SAC

Objective 1 is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 2	Habitat area was estimated at 2799ha using OSI data and the defined Transitional Water Body area under the Water Framework Directive. See marine habitats supporting document for further information
Community distribution	Hectares	The Subtidal fine sand community complex should be conserved in a natural condition. See map 4	Habitat structure was elucidated from intertidal core and dig sampling undertaken in 2007 and 2008 combined with data obtained from subtidal grab samples obtained in 2009. See marine habitats supporting document for further information

Objective 2: [1140] Mudflats and sandflats not covered by seawater at low tide - To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide at Dundalk Bay SAC

Objective 2 is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 3	Habitat area was estimated at 4375ha using OSI data. See marine habitats supporting document for further information
Community distribution	Hectares	The Muddy fine sand community and Intertidal fine sand community complex should be conserved in a natural condition. See map 4	Habitat structure was elucidated from intertidal core and dig sampling undertaken in 2007 and 2008 combined with data obtained from subtidal grab samples obtained in 2009. See marine habitats supporting document for further information

Objective 3 - [1220] Perennial vegetation of stony banks - To maintain the favourable conservation condition of Perennial vegetation of stony banks in Dundalk Bay SAC

Objective 3 is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable, subject to natural processes, including erosion and succession	Exact current area unknown, but shingle is known to occur almost continuously from Salterstown to Lurgan White House in the south bay and from Jenkinstown to east of Giles Quay in the north bay. Shingle is estimated to cover 12ha. Probably less than 25% of this would be vegetated. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes	See coastal habitats supporting document for further details
Physical structure: Functionality and sediment supply	Presence/absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from the national shingle beach survey conducted in 1999 (Moore and Wilson, 1999). See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of habitat zonations including transitional zones, subject to natural processes including erosion and succession. See map 5	Based on data from Moore and Wilson (1999). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain the presence of species-poor communities with characteristic species: *Honckenya peploides*, *Beta vulgaris* ssp. *maritima*, *Crithmum maritimum*, *Tripleurospermum maritimum*, *Glaucium flavum* and *Silene uniflora*	Based on data from Moore and Wilson (1999). See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Moore and Wilson (1999). See coastal habitats supporting document for further details

Objective 4: [1310] Salicornia and other annuals colonizing mud and sand – To restore the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in Dundalk Bay SAC

Objective 4 is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site surveyed: 35.00ha. See map 5	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). One sub-site (Dundalk Bay) was mapped, giving a total estimated area of 35ha for Salicornia mudflat, which is one of the largest areas of this habitat in the country. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details.
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 5 for known distribution	See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession. See map 5	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009)
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from McCorry and Ryle (2009)
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with characteristic species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details

Objective 5: [1330] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) - To maintain the favourable conservation condition of Atlantic salt meadows in Dundalk Bay SAC

Objective 5 is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For the sub-site (357.57ha) and potential areas (22.42ha) mapped: 379.98ha. See map 5	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). One sub-site (Dundalk Bay) was mapped and additional areas of potential saltmarsh were identified from an examination of aerial photographs, giving a total estimated area for Atlantic salt meadow of 379.98ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further information
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 5 for known distribution	See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession. See map 5	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009)
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from McCorry and Ryle (2009)
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with characteristic species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation structure: negative indicator species- *Spartina anglica*	Hectares	No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details

Objective 6: [1410] Mediterranean salt meadows (Juncetalia maritimi) - To maintain the favourable conservation condition of Mediterranean salt meadows in Dundalk Bay SAC

Objective 6 is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: 0.045ha. See map 5	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). One sub-site (Dundalk Bay) was mapped, giving a total estimated area of 0.045ha for Mediterranean salt meadow. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 5 for known distribution	See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession. See map 5	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009)
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from McCorry and Ryle (2009)
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with characteristic species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation structure: negative indicator species- *Spartina anglica*	Hectares	No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details

As can be seen in Figure 5 and 6, the proposed coastal works site is located within the boundary of the Dundalk Bay SPA and in close proximity to Dundalk Bay SAC both of which are Natura 2000 sites. Therefore, they are within the likely zone of impact of the proposed coastal works site. As stated previously, there are no surface water bodies either within or on the boundaries of the proposed coastal works site. As such, there is no discharge of stormwater from the site to Dundalk Bay SPA or SAC.

Characteristics of Potential Impacts

The potential impact of the proposed development must be considered in terms of the works required to construct the 2 areas of new rock armour at Locations A and B and to repair the stone sea wall at Location C and after the construction works are completed (i.e., during operation).

Construction Impacts

As stated in Section 1, Introduction, there is a requirement to carry out the following groundworks:

Location A

- Approximately between Chainage 0m and 60m;
- 60 linear meters of basic excavation works, approximately 1m deep and approximately 1-3m wide;
- Placement of a geotextile membrane; and
- Installation 60 linear meters of rock armour protection.

Location B

- Approximately between Chainage 205m and 220m;
- 15 linear meters of basic excavation works, approximately 1m deep and approximately 1-3m wide;
- Placement of a geotextile membrane; and
- Installation of 15 linear meters of rock armour protection.

Location C

- Approximately between Chainage 220m and 245m;
- Replacement and resetting of displaced stonework to existing coastal protection works over an area of approximately 100sq.m; and
- Provision of a concrete layer to the underside of reset stonework.

To construct the above-mentioned rock armour at Locations A and B coastal protection works area, the existing soil embankment, subsoil and sediment within a 225m^2 area (i.e., 75m x 3m) will need to be removed by excavator to a depth of 1m below ground level (see Plate 30 following). The excavated material will be reused to fill voids within the rock armour where possible, and where possible, blended into the existing foreshore landscape.

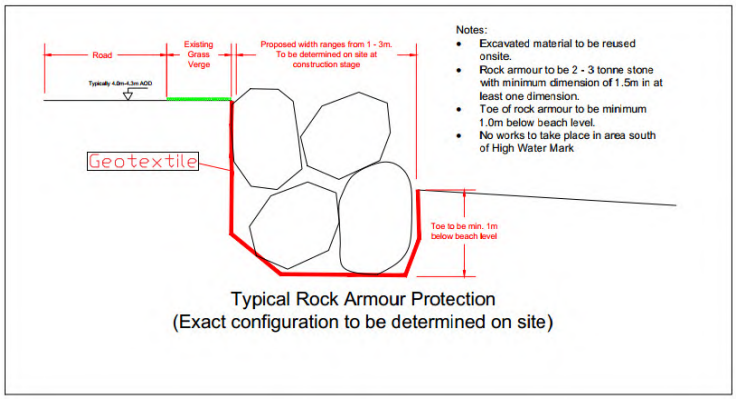


Plate 30. Extract of civil engineering drawings for proposed Coastal Works at Bellurgan showing section through proposed rock armour for Locations A and B Work Areas

It is proposed to recycle any suitable boulders excavated as part of the groundworks. Any materials excavated onsite which may be suitable for the rock armour will be segregated and placed in a temporary stockpile at a suitable location upgradient of the site.

Following the excavation, a geotextile membrane will be placed and spread on the bottom and side walls of the excavation. Following this, select boulders will be placed into the excavation. Then the previously excavated suitable material will be used to fill void spaces within the emplaced boulders.

To repair the stone sea wall at Location C works area, it is proposed to initially remove the displaced stonework over an area of approximately 100m^2. Following this, a geotextile membrane will be placed in the excavation and spread on side walls of the excavation. Then a 300mm layer of concrete will be put in place with the original stone then set into the concrete and allowed to set (see Plate 31 following).

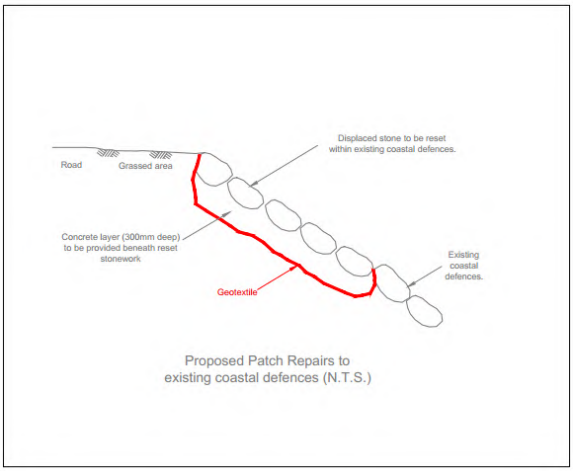


Plate 31. Extract of civil engineering drawings for proposed Coastal Works at Bellurgan showing section through proposed stone sea wall for Locations C Work Area

These impacts would be regarded as short-term. The highest risk posed to the foreshore is calcite runoff from the newly created stone sea wall either coming in contact with seawater at high tide and/or heavy rainfall creating calcite contaminated stormwater which will run onto the foreshore.

In ensure that this does not happen, a tarpaulin should be put in place to prevent rainfall making contacting with the newly repaired stone sea wall while it is setting. These works will be carried out during a suitable time of the year to allow the concrete to cure properly (i.e., when the highest tides will not reach the proposed works).

In order to carry out the coastal works, a 30-tonne excavator and site dumper will be required to excavate the ground for the rock armour and to place suitable boulders. Given the risk posed by the leakage of hydrocarbons from the excavator and dumper (e.g., hydraulic fluid from leaking cables, leaking diesel, lube oil, etc), a sufficiently long floating spill boom will need to be put in place on the foreshore to prevent the spread of any hydrocarbons in the event that a leakage of hydrocarbons occurs. The floating spill boom will be required to completely encircle the entire works area with the boom being tethered to posts installed upgradient of the high-water mark.

Two temporary haul roads, an Engineered Haul Road and a Non-Engineered Haul Road, between 3-5m wide have been proposed between the site boundaries and the high tide mark. This is to allow machinery access to transport materials to and from the works areas and to avoid blocking the adjacent local public road. To achieve access to Location A, a ramp is proposed extending from the adjacent road to the foreshore to the west of location A. This will allow access to a Temporary Engineered Haul Road which will run along the full length of location A. This constructed haul road will pass through the *LS1-Shingle and Gravel Shore* habitat. In order to protect the vegetated shingle and gravel shore areas and minimise disturbance, the Temporary Engineered Haul Road will consist of pea gravel, geotextile terram, overlaid with aggregate and gravel cover (see Figure 12). Following completion of the works at Location A, the haul road will be carefully removed from the foreshore with the objective of returning it to its original state. Adjacent areas of existing of plant life will be demarcated at the start of the project and fenced off prior to the commencement of construction works.

To achieve access to Locations B and C, a ramp is proposed extending from the adjacent road to the foreshore to the west of Location B where vegetation cover is lowest (see Figure 13). This second Temporary Haul Road will not require a protective engineered design as in Location A, as there is little plant life present along its route in comparison. This temporary haul road will be located along the foreshore through the *LS1-Shingle and Gravel Shore* habitat, where vegetation is sparser, while avoiding the *CM1-Lower Salt Marsh* habitat. It is preferable to route the temporary haul road through this area, rather that the *CM1-Lower Salt Marsh* where the plants would be compacted into the underlying strata through the creation of the haul road. Adjacent *CM1-Lower Salt Marsh* habitat will be demarcated at the start of the project and fenced off prior to the commencement of construction works.

Operational Impacts

Designated Areas for Nature Conservation

The proposed coastal protection works require 60m of new rock armour to be constructed in Location A between Chainage 0m and 60m and 15m of rock armour to be constructed in Location B between Chainage 205m and 220m. Therefore, there is a required land take of 225m^2 for the additional rock armour. At Location C, approximately 100m^2 of the stone sea wall will be repaired and will be effectively identical to the previous sea wall (i.e., albeit a more robust construction).

Once the civil works are complete, there will be an additional 225m^2 of rock armour at Locations A and B and as such, there will be a change in the physical state of the northern edge of Dundalk Bay SPA. The introduction of the rock armour will result in a permanent change from its current habitat which is a mixture of *LS1- Shingle & Gravel Shores* and *GA2 – Amenity Grassland (Improved),* to *CC1- sea walls, piers, and jetties* (see Figures 9, 10 and 11).

In order to enhance recolonisation by *LS1- Shingle & Gravel Shores* habitat plant species, it is proposed that during the excavation works, that the topsoil excavation is segregated and stockpiled offsite. It is proposed that during the final stages of the rock armour construction, that this topsoil is used as 'packing' in around the larger boulders. It is expected that these steps will enhance the ecosystem on the foreshore as *LS1- Shingle & Gravel Shores* habitat plant species within the replaced topsoil will germinate in the gaps between the larger boulders within the rock armour. This new growth of *LS1- Shingle & Gravel Shores* vegetation will provide a refuge to invertebrates and acts as a surface area for marine plant life.

At the Post-Construction Phase, there are no viable source-pathway-receptor linkages which can affect the Dundalk Bay SAC and/or Dundalk Bay SPA given the nature of the proposed coastal protection works. There will be no stormwater discharge or calcite leachate run-off to surface water emanating from the site. As such, there will be negligible risk of run-off from concrete within the stone sea wall once construction is complete.

7 IDENTIFICATION AND EVALUATION OF LIKELY SIGNIFICANT EFFECTS

7.1 Other Plans or Projects Adjacent or in the Vicinity of the site which could act in Combination with potential impacts from the Proposed Coastal Protection Works

7.1.1 Consideration of Potential 'In-Combination' Effects

In-combination effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2018). Different types of actions can cause cumulative impacts and effects. As such, these types of impacts may be characterised as:

- *Additive/incremental* – in which multiple activities/projects (each with potentially insignificant effects) add together to contribute to a significant effect due to their proximity in time and space (CIEEM, 2018); and
- *Associated/connected* – a Development activity 'enables' another Development activity e.g. phased Development as part of separate planning applications. Associated Developments may include different aspects of the project which may be authorised under different consent processes. It is important to assess impacts of the 'project' as a whole and not ignore impacts that fall under a separate consent process (CIEEM, 2018).

In-combination effects are required to be considered at Screening for Appropriate Assessment Stage, and within an Appropriate Assessment itself. The scope of plans or projects considered for 'in-combination' effects includes plans and projects that are completed, approved or proposed to take into account effects that occur over time (EC, 2002). According to the European Commission (2006):

"[…] any element of a plan or project that has the potential to affect the conservation objectives of a Natura 2000 site, including its structure and function, should be considered significant"

7.1.2 Potential Additive/Incremental Impacts

A review was undertaken to identify any planning permissions granted within the last 5 years and within 500m of the proposed coastal works which could hypothetically result in ***'in-combination impacts'*** on Dundalk Bay SAC and/or the Dundalk Bay SPA. A review of the Louth County Council planning application database did not reveal any planning applications which fitted this criterion.

It should be noted that there are 2 other Coastal Protection Works projects proposed by Louth County Council for the Cooley Peninsula that require planning applications to An Bord Pleanála under Section 177AE of the Planning and Development Act 2000 as amended (Appropriate Assessment). The first of these projects is located at Ballagan, Greenore, County Louth and is 14.5km from the Bellurgan site. The 2nd project is located at Drummullagh, Omeath, County Louth and is 10.6km from the Bellurgan

site. Given the significant distance between the Bellurgan Point site and the 2 aforementioned sites, there is very low potential for 'in-combination impacts' between the Bellurgan Point construction works and these works even if they are carried out at the same time.

The European Pollutant Release and Transfer Register (E-PRTR) was reviewed to determine if any EPA licensed facilities are located within the vicinity of the site. There are no EPA licensed facilities with the potential for additive effects near the development site.

For the proposed Coastal Protection Works, using the *'Source-Pathway-Receptor'* risk assessment methodology, there does not appear to be viable pollutant linkages from these works to the principal receptors of concern, Dundalk Bay SAC and Dundalk Bay SPA.

As such, with best practice construction techniques combined with the mitigation measures proposed for these projects, there does not appear to be any significant *'in-combination'* hydrological or other types of impacts in combination with the proposed Coastal Protection Works on the Dundalk Bay SPA or SAC.

7.2 Evaluation of potential impacts from the Proposed Coastal Protection Works on the Natura 2000 Sites

The proposed works are located within the boundary of Dundalk Bay SPA and within 5m of Dundalk Bay SAC, and as such there is the potential for direct impacts upon Dundalk Bay SPA and Dundalk Bay SAC (i.e., Natura 2000 sites) from the proposed coastal protection works (see Table 10 below and Table 11 following). Two temporary haul roads, an Engineered Haul Road and a Non-Engineered Haul Road, between 3-5m wide have been proposed between the site boundaries and the high tide mark. This is to allow machinery access to transport materials to and from the works areas and to avoid blocking the adjacent local public road. To achieve access to Location A, a ramp is proposed extending from the adjacent road to the foreshore to the west of location A. This will allow access to a Temporary Engineered Haul Road which will run along the full length of location A. In order to protect the vegetated shingle and gravel shore areas and minimise disturbance, the Temporary Engineered Haul Road will consist of pea gravel, geotextile terram, overlaid with aggregate and gravel cover. To achieve access to Locations B and C, a ramp is proposed extending from the adjacent road to the foreshore to the west of Location B where vegetation cover is lowest. This second Temporary Haul Road will not require a protective engineered design as in Location A, as there is little plant life present along its route in comparison.

The requirement for the aforementioned temporary haul roads means that construction works will encroach into Dundalk Bay SAC. There is, therefore, a direct S-P-R linkage between the site works and these Natura 2000 sites. As Dundalk Bay SAC and Dundalk Bay SPA are dependent on water quality, a reduction in water quality or changes to local hydrology could negatively impact upon the conservation status of the SAC and/or SPA with regard to habitat quality and size and with regard to the ecological

integrity of those species occurring within it. The proposed area for the rock armours is in proximity to Annex 1 habitats which are of qualifying interest for Dundalk Bay SAC. These areas may be impacted during construction if mitigation measures are not taken during the construction phase.

Table 10 lists Natura 2000 sites in the Republic of Ireland and Northern Ireland within 15km of the proposed site and the potential impacts associated with the proposed site activity.

Table 10. The Potential for Impacts (Alone or in Combination with other Plans/Projects) on Natura 2000 Sites within 15km of the Proposed Coastal Works at Bellurgan Point

SITE NAME	DIRECT IMPACTS	INDIRECT / SECONDARY IMPACTS	RESOURCE REQUIREMENTS (WATER ABSTRACTION ETC).	EMISSIONS (TO LAND, WATER OR AIR)	EXCAVATION REQUIREMENTS	DURATION OF CONSTRUCTION AND OPERATION
Dundalk Bay SPA [004026]	Potential	Potential	None Predicted	Potential	Potential	None Predicted
Dundalk Bay SAC [000455]	Potential	Potential	None Predicted	Potential	Potential	None Predicted
Carlingford Mountain SAC [000453]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted
Carlingford Shore SAC [002306]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted
Carlingford Lough SPA [004078]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted
Slieve Gullion SAC [UK 0030277]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted
Carlingford Lough SPA [UK9020161]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted
Rostrevor Wood SAC [UK 0030268]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted

Table 11. Potential Changes to Natura 2000 Sites within 15km of the of the Proposed Coastal Works at Bellurgan Point

Site Name	Reduction of Habitat Area	Disturbance to Key Species	Habitat / Species Fragmentation	Reduction in Species Density	Changes in Key Indicators of Conservation Value	Climate Change
Dundalk Bay SPA [004026]	Potential	Potential	Potential	Potential	Potential	None Predicted
Dundalk Bay SAC [000455]	Potential	Potential	Potential	Potential	Potential	None Predicted
Carlingford Mountain SAC [000453]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted
Carlingford Shore SAC [002306]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted
Carlingford Lough SPA [004078]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted
Slieve Gullion SAC [UK 0030277]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted
Carlingford Lough SPA [UK9020161]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted
Rostrevor Wood SAC [UK 0030268]	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted

7.3 Screening Assessment Conclusions

In order to determine the potential impacts, if any, of the proposed coastal works on nearby Natura 2000 sites, a screening process was completed. This identified 8 no. different Natura 2000 sites within a 15km radius, which are designated as either as an SAC or SPA in both the Republic of Ireland and Northern Ireland. It has been determined that, of the 8 sites, only 2 are potentially impacted by the proposed coastal protection works (i.e., Dundalk Bay SAC (000455) and Dundalk Bay SPA (004026)).

It has been determined that there is a potential risk to water quality/benthic biota within the Dundalk Bay SPA and SAC should contaminated surface water enter the foreshore as a consequence of site-based runoff or other ongoing operations. Therefore, a full Stage 2 Appropriate Assessment has been conducted for the site, with an assessment of the potential mitigation of the afore-mentioned impacts.

8 APPROPRIATE ASSESSMENT

Screening identified potential impacts on Dundalk Bay SAC and Dundalk Bay SPA and therefore a Stage 2 - Appropriate Assessment was carried out to determine if the project will adversely affect the integrity of this Natura 2000 site. It involves the identification of the habitats and species within the site, and an assessment of the significance of impacts on their conservation status. An assessment of impacts is carried out, and mitigation measures proposed for potential impacts. Any negative impacts on the integrity of structure, function or conservation objectives of these sites will require the implementation of avoidance or mitigation measures to avoid progression to Stages 3 and 4 of the Appropriate Assessment process.

It should be noted that it is the goal of National Parks and Wildlife Services (NPWS) to draw up conservation plans for all areas designated for nature conservation, and that these plans will, among other things, set clear objectives for the conservation of the features of interest within a site. The NPWS have provided a site synopsis, Conservation Objectives and a Natura 2000 data form for Dundalk Bay SAC and Dundalk Bay SPA, from which information is sourced (see Appendix 2).

8.1 Description of the Qualifying Interests, Vulnerabilities and Conservation Status of Natura 2000 Sites Potentially Impacted upon by the Proposed Coastal Protection Works

8.1.1 Dundalk Bay SPA (004026)

Dundalk Bay is a large open shallow sea bay with extensive saltmarshes and intertidal sand/mudflats, extending some 16km from Castletown River on the Cooley Peninsula, in the north, to Annagassan/Salterstown in the south.

The extensive sand flats and mud flats have a rich fauna of bivalves, molluscs, marine worms and crustaceans which provides the food resource for most of the wintering waterfowl. The outer part of the bay provides excellent shallow-water habitat for divers, grebes and sea duck. In summer, it is thought to be a major feeding area for auks from the Dublin breeding colonies. The bay is used at night for roosting by wintering flocks of Greylag Goose, Greenland White-fronted Goose and Whooper Swan from Stabannan/Braganstown (inland of Castlebellingham) and other inland sites.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Great Crested Grebe, Greylag Goose, Light-bellied Brent Goose, Shelduck, Teal, Mallard, Pintail, Common Scoter, Red-breasted Merganser, Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Black-headed Gull, Common Gull and Herring Gull. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The site is of international importance because it regularly supports an assemblage of over 20,000 wintering waterbirds. It also qualifies as a site of international importance for supporting populations of Light-bellied Brent Goose (370), Knot (9,710), Black-tailed Godwit (1,100) and Bar-tailed Godwit (1,950) - all figures, unless stated otherwise, are five-year mean peaks for the period 1995/96 to 1999/2000. A variety of other species occur in numbers of national importance, i.e. Great Crested Grebe (303), Greylag Goose (435), Shelduck (522), Teal (538), Mallard (765), Pintail (117), Common Scoter (581 - five year mean peak for the period 2000/01 to 2004/05), Red-breasted Merganser (121), Oystercatcher (8,746), Ringed Plover (151), Golden Plover (5,967), Grey Plover (204), Lapwing (4,892), Dunlin (11,518), Curlew (1,264) and Redshank (1,659). Other wintering species which occur include Red-throated Diver, Great Northern Diver, Cormorant, Grey Heron, Little Egret, Mute Swan, Wigeon, Goldeneye, Greenshank and Turnstone.

The site also supports nationally important populations of three wintering gull species - Black-headed Gull (6,643), Common Gull (551) and Herring Gull (754). In spring and autumn, the site attracts a range of passage migrants, including Little Stint, Curlew Sandpiper and Ruff. Dundalk Bay SPA is one of the most important wintering waterfowl sites in the country and one of the few that regularly supports more than 20,000 waterbirds. Four species occur in numbers of international importance and a further 19 species in numbers of national importance. The regular occurrence of Golden Plover, Bar-tailed Godwit, Red-throated Diver, Great Northern Diver and Little Egret is of particular note as these species are listed on Annex I of the E.U. Birds Directive. Dundalk Bay is a Ramsar Convention site and parts of Dundalk Bay SPA are designated as Wildfowl Sanctuaries.

8.1.2 Dundalk Bay SAC (000455)

Dundalk Bay, Co. Louth, is a very large open, shallow sea bay with extensive saltmarshes and intertidal sand/mudflats, extending some 16 km from Castletown River on the Cooley Peninsula in the north, to Annagassan/Salterstown in the south. The bay encompasses the mouths and estuaries of the Rivers Dee, Glyde, Fane, Castletown and Flurry. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive: *[1130] Estuaries, [1140] Tidal Mudflats and Sandflats, [1220] Perennial Vegetation of Stony Banks, [1310] Salicornia Mud, [1330] Atlantic Salt Meadows* and *[1410] Mediterranean Salt Meadows.*

Saltmarsh vegetation occurs in four main areas: at Lurgangreen, Marsh South, Dundalk Harbour and Bellurgan. Two types are represented – Atlantic and Mediterranean salt meadows. The Atlantic salt meadows are commonest and are characterised by Sea-purslane (*Halimione portulacoides*) (often as a dominant band), along with Common Saltmarsh-grass (*Puccinellia maritima*), Thrift (*Armeria maritima*), Red Fescue (*Festuca rubra*), Common Scurvygrass (*Cochlearia officinalis*), Sea Plantain (*Plantago maritima*) and Sea Rush (*Juncus gerardi*). Common Cord-grass (*Spartina anglica*) is frequent and often dominant over substantial areas. Glassworts (*Salicornia* spp.) occur on the lower zones of the saltmarshes, and in places extend out onto the sandflats. Mediterranean salt meadows are mostly confined to the upper levels of the saltmarshes or along stream sides where they merge with grassland habitats (though the transitional zone is now absent in many places). The habitat contains Sea

Rush (*Juncus maritimus*), Sea Arrowgrass (*Triglochin maritima*) and Sea Aster (*Aster tripolium*). The saltmarshes at Lurgangreen and Marsh South are partially fenced and grazed by sheep.

Shingle beaches are particularly well represented in Dundalk Bay, occurring more or less continuously from Salterstown to Lurgan White House in the south bay, and from Jenkinstown to east of Gyles Quay in the north bay. The shingle is mostly stable, occurring on post-glacial raised beaches. The shingle often occurs in association with intertidal shingle, saltmarsh and or shingle-based grassland. The shingle supports species such as Spear-leaved Orache (*Atriplex prostrata*), Sea Mayweed (*Matricaria maritima*), Sea Beet (*Beta vulgaris* subsp. *maritima*), Sea Rocket (*Cakile maritima*), Wild Carrot (Daucus carota), Sea-holly (Eryngium maritimum), Sea Sandwort (Honkenya peploides) and Sea Radish (*Raphanus raphanistrum* subsp. *maritimus*). Yellow Hornedpoppy (*Glaucium flavum*) and Lyme-grass (*Leymus arenarius*) occur here at their most northern locality on the east coast, while the Red Data Book species Seakale (*Crambe maritima*) has recently been recorded.

The extensive sandflats and mudflats (over 4,000 ha) occur and are comprised of ecological communities such as muddy fine sand communities and fine sand community complexes. In the centre of Dundalk Bay there is a gravel community dominated by polychaetes. These habitats host a rich fauna of bivalve molluscs, marine worms and crustaceans and are the main food resource of the tens of thousands of waterfowl (including waders and gulls) which feed in the intertidal area of Dundalk Bay. The saltmarshes are used as high-tide roosts by all of these species, while the grazing birds (notably Brent Goose and Wigeon) feed on the saltmarsh grasses, areas of Zostera and other grassland vegetation. Brent Goose also feed on the mats of green algae on the mudflats. At night the wintering Greylag and Greenland White-fronted Goose, and Whooper Swans, from Stabannan/Braganstown (inland from Castlebellingham) roost in Dundalk Bay.

The site is internationally important for waterfowl (numbers in brackets refers to the average maximum over the period 1994/95 to 1997/98) because it regularly holds over 20,000 birds (up to 57,000 have been recorded) and supports over 1% of the North-West European/East Atlantic Flyway populations of Brent Goose (366), Bartailed Godwit (2,312) and Knot (11,948). Additionally, it is nationally important for Golden Plover (4,266), Great Crested Grebe (193), Greylag Goose (312), Shelduck (463), Mallard (657), Pintail (100), Red-breasted Merganser (148), Oystercatcher (6,940), Grey Plover (218), Ringed Plover (133), Wigeon (565), Dunlin (9,112), Blacktailed Godwit (754), Curlew (1,593), Lapwing (4,822), Greenshank (20) and Redshank (1,455). Both Golden Plover and Bar-tailed Godwit are Annex I species. The site has been designated a Special Protection Area (SPA) under the E.U. Birds Directive and it is also a designated Ramsar site.

This is a site of significant conservation value because it supports good examples of a range of coastal habitats listed on Annex I of the E.U. Habitats Directive, as well as large numbers of bird species, some of which are listed in the Birds Directive.

9 IMPACT ASSESSMENT

9.1 Identified Impacts

Given the position of the site within and on the edge of the SPA and the SAC, an S-P-R linkage between the proposed Coastal Protection Works and Dundalk Bay can be completed. Any impacts by the proposed Coastal Protection Works on the water quality of Dundalk Bay could have negative impacts on other sites downstream. Also, the proposed area for the rock armour between the 20 and 60-metre Chainage contains an Annex 1 habitat which is of qualifying interest for Dundalk Bay SAC. These areas may be impacted during construction if mitigation measures are not put in place prior to the commencement of construction and during the construction phase. Although these are Annex I habitats, they are not listed as one of the 16 *priority* habitats in Ireland, as outlined in the *Interpretation manual of European Union habitats* (European Commission, 1996), which acts as a guide to habitats in Annex I of the Habitats Directive (Directive 92/43/EEC, amended by Directive 97/62/EC). It is based on the hierarchical classification of European habitats that was developed as part of the CORINE Biotopes Project (Commission of the European Communities, 1991). Minor losses of non-priority Annex I habitats can be allowed once they are not assessed as significant.

10 PROPOSED MITIGATION MEASURES

The proposed works will be carried out by contractors who can meet the requirements of the standard best practice measures outlined below. The relevant appointed contractor shall have regard to measures to be implemented during the construction phase of the proposed works. The purpose of these measures is to ensure the strict protection of water quality in the freshwater environment and by extension the protection of the nearby designated European Sites. The appointed contractor shall be vigilant in ensuring that no activities, listed or otherwise, give rise to pollution of the nearby Dundalk Bay SAC/SPA protected habitat with suspended solids or other pollution related material having due regards to the following measures outlined below:

Construction Mitigation Measures

- A site-specific Construction and Environmental Management Plan (CEMP) will be prepared for the development in advance of the works by the appointed Contractor with a draft CEMP submitted to Louth County Council's representative for approval prior to commencement of the works;
- Prior to the commencement of construction, a separate Invasive Alien Plant Species (IAPS) assessment may be required along with this report. The project site may need to be re-surveyed to establish the extent and locations of invasive plant species within the site in order to determine buffer zones and a suitable management strategy;
- In order to minimise any impact to Annex I habitats (*[1220] Perennial Vegetation of Stony Banks* and *[1330] Atlantic salt meadows*) in the vicinity of the area proposed for the new rock armour, it is proposed that daily supervision by an Ecological Clerk of Works (EcOW) is provided. Those areas on the foreshore identified as Annex I habitats should be fenced off prior to construction works commencing with daily monitoring carried out before, during and after the completion of the construction works;
- Construction of coastal protection works should only take place outside of the winter migratory bird months of September to March;
- Two temporary haul roads, an Engineered Haul Road and a Non-Engineered Haul Road, between 3-5m wide have been proposed between the site boundaries and the high tide mark. This is to allow machinery access to transport materials to and from the works areas and to avoid blocking the adjacent local public road. To achieve access to Location A, a ramp is proposed extending from the adjacent road to the foreshore to the west of location A. This will allow access to a Temporary Engineered Haul Road which will run along the full length of location A. In order to protect the vegetated shingle and gravel shore areas and minimise disturbance, the Temporary Engineered Haul Road will consist of pea gravel, geotextile terram, overlaid with aggregate and gravel cover. To achieve access to Locations B and C, a ramp is proposed extending from the adjacent road to the foreshore to the west of Location B where vegetation cover is lowest. This second Temporary Haul Road will not require a protective engineered design as in Location A, as there is little plant life present along its route in comparison.

- A tarpaulin sheet should also be placed over vegetation within 1-2 metres of site works to prevent any damage caused by excavation or construction works;
- During periods of heavy precipitation and run-off, works will be halted or working surfaces/pads will be provided to minimise soil disturbance;
- Any bulk fuel storage tank should be a sufficient distance from the foreshore and properly bunded with a bund capacity of at least 110% of that of the fuel tank. No refuelling or storage of fuel will occur within the works area;
- Disturbance will be minimised when excavating with retention of existing vegetated areas as much as possible. By limiting land disturbance, erosion hazards will be reduced;
- The pouring of concrete for the project shall be completed during dry weather to avoid seepage to the groundwater environment;
- Temporary fills or stockpiles will be covered with tarpaulin to avoid sediment release associated with heavy rainfall;
- All fuels, lubricants and hydraulic fluids for equipment used on the construction site should be stored a sufficient distance from the foreshore in a roofed and bunded hazardous liquids container. These liquids should be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment in accordance with current best practice;
- A wheelie bin type hydrocarbon spill kit will be required and should be positioned close to the works area at the foreshore to deal with any leakage from plant working within the coastal protection works site; and
- Given the risk posed by the leakage of hydrocarbons from the excavator and dumper (e.g., hydraulic fluid from leaking cables, leaking diesel, lube oil, etc), a sufficiently long floating spill boom with a suspended curtain will need to be put in place on the foreshore to prevent the spread of any hydrocarbons in the event that a leakage of hydrocarbons occurs. The floating spill boom will be required to completely encircle the entire works area with the boom being tethered to posts installed upgradient of the high-water mark. The integrity of the boom will require checking twice a day.

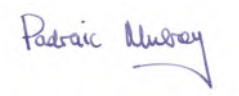
11 CONCLUSIONS

Provided the afore-mentioned mitigation measures are applied to ensure that no contaminants enter the foreshore area and hence the SPA and SAC and provided these measures are enforced during the construction period, it is considered that the proposed Coastal Protection Works will have no adverse impacts on the integrity of any of the species or habitats of the Dundalk Bay SPA and/or Dundalk Bay SAC or on any other Natura 2000 site within a 15km radius of the site.

On the basis of the findings of this Natura Impact Statement, it is concluded that the proposed Coastal Protection Works will not have a significant effect on the Natura 2000 network and neither a Stage 3. Assessment of Alternative Solutions or a Stage 4. Assessment Where Adverse Impacts Remain is required.

Yours sincerely,

Leanne Tuohy, BSc.
Staff Ecologist
Mulroy Environmental



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SERVICE CONSTRAINTS

1. This report and the AA Screening Assessment carried out in connection with the report (together the "Services") were compiled and carried out for Louth County Council (the "client") in accordance with the terms of an emailed fee proposal agreement Fee Proposal PRP524.18.04.2023 between Mulroy Environmental Ltd. and the "client" dated the 18th April, 2023. Mulroy Environmental Ltd. received permission to proceed by email (i.e., a 'Letter of Acceptance') on the 29th May, 2023. The Services were performed by Mulroy Environmental Ltd. with the skill and care ordinarily exercised by a reasonable Environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by Mulroy Environmental Ltd. taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between Mulroy Environmental Ltd. and the client.

2. Other than that expressly contained in paragraph 1 above, Mulroy Environmental Ltd. provides no other representation or warranty whether express or implied, in relation to the Services.

3. Unless otherwise agreed the Services were performed by Mulroy Environmental Ltd. exclusively for the purposes of the client. Mulroy Environmental Ltd. is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, Mulroy Environmental Ltd. does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and Mulroy Environmental Ltd. disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.

4. It is Mulroy Environmental Ltd.'s understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without Mulroy Environmental Ltd. be requested to review the report after the date hereof, Mulroy Environmental Ltd. shall be entitled to additional payment at the then existing rates or such other terms as agreed between Mulroy Environmental Ltd. and the client.

5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Mulroy Environmental Ltd. In the absence of such written advice of Mulroy Environmental Ltd., reliance on the report in the future shall be at the client's own and sole risk. Should Mulroy Environmental Ltd. be requested to review the report in the future, Mulroy Environmental Ltd. shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Mulroy Environmental Ltd. and the client.

6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and Mulroy Environmental Ltd. Mulroy Environmental Ltd. has not performed any observations, investigations, studies or testing not

specifically set out or required by the contract between the client and Mulroy Environmental Ltd.. Mulroy Environmental Ltd. is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, Mulroy Environmental Ltd. did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.

7. The Services are based upon Mulroy Environmental Ltd.'s observations of existing physical conditions at the Site gained from a walk-over survey of the site together with Mulroy Environmental Ltd.'s interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which Mulroy Environmental Ltd. was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by Mulroy Environmental Ltd. and the observations possible at the time of the walk-over survey. Further Mulroy Environmental Ltd. was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. Mulroy Environmental Ltd. is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to Mulroy Environmental Ltd. and including the doing of any independent investigation of the information provided to Mulroy Environmental Ltd. save as otherwise provided in the terms of the contract between the client and Mulroy Environmental Ltd..

8. The environmental monitoring aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and Mulroy Environmental Ltd.] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.

9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features