Malachy Walsh and Partners
Engineering and Environmental Consultants

Natura Impact Statement (NIS)

Glengarriff Pontoon Dredging, Glengarriff, Cork

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1 SUMMARY OF FINDINGS

1.1 NATURA IMPACT STATEMENT

Project Title	Glengarriff Pontoon Dredging, Glengarriff, Cork
Project Proponent	Cork County Council
Project Location	Located just outside Glengarriff village on the Beara Peninsula in County Cork. Site is approximately 75km west of Cork City and 10km north of Bantry.
Natura Impact Statement	In cases where an Appropriate Assessment is required a Natura Impact Statement (NIS) is prepared. This is a report based on a scientific examination of evidence and data, carried out by competent persons with the aim of identifying and classifying any implications of a proposal, either individually, or in combination with other plans or projects, on Natura 2000 sites in view of the conservation objectives of the sites
Conclusion	In conclusion, provided the recommended mitigation measures are implemented in full, which relate primarily to the protection of otter and harbour seal, it is not expected that the proposal to carry out dredging works at Glengarriff Pontoon will result in any adverse residual impacts on the Natura 2000 sites considered in this NIS, namely: • Glengarriff Harbour & Woodlands SAC (000090)

2 INTRODUCTION

Appropriate Assessment is the consideration of the impact on the integrity of the Natura 2000 site of the project, either alone or in combination with other plans or projects, with respect to the site's ecological structure and function, and conservation objectives. Additionally, mitigation of these effects can be considered. A Screening for Appropriate Assessment was completed and determined the need for full Appropriate Assessment (see **Appendix 2**).

In cases where an Appropriate Assessment is required a Natura Impact Statement (NIS) shall be prepared and shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for Natura 2000 sites in the view of the conservation objectives of the site. The aim of the assessment is to provide a sufficient level of information to the competent authority on which to base their appropriate assessment of the plan or project. The plan or project should be fully described particularly in relation to the aspects that could interact with the surrounding environment. The proposed dredging works for Glengarriff pontoon are fully described in **Section 4.3** below.

The focus of the assessment is to determine whether the proposed dredging works at the pontoon at Glengarriff Pier, Glengarriff, Co. Cork will have a significant negative impact on the features of interest of the Natura 2000 site i.e. habitats and species. This assessment identifies the environmental aspects of the project that will interact with the ecological requirements or sensitivities of the habitats and species, and in this case these relate mainly to potential impacts to marine mammals during the proposed dredging works, as well as potential in-combination effects throughout the undertaking of the project.

The 'test' of the assessment is whether the plan or project will have an adverse effect on the integrity of the Natura 2000 site. Where potentially significant effects are identified proven mitigation measures will be recommended.

This report was authored by Fergus Doyle (MSc) with input from Hazel Dalton (BSc.). Fergus is an environmental scientist with an MSc in environmental protection and management, and has over 3 years' experience in environmental consultancy and appropriate assessment. Hazel is an ecologist with over six years' experience with MWP in ecological surveying, ecological impact assessment and the appropriate assessment process.

3 METHODOLOGY

3.1 APPROPRIATE ASSESSMENT GUIDANCE

This Natura Impact Statement has been undertaken in accordance with the following guidance:

- DoEHLG Circular NPWS 1/10 & PSSP 2/10 Appropriate Assessment unde Article 6 of the Habitats Directive: Guidance for Planning Authorities.
- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environmental Heritage and Local Government.

- European Commission (2018) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

Further information is available at:

- http://ec.europa.eu/environment/nature/legislation/habitatsdirective/
- http://www.npws.ie/planning/appropriateassessment/

The aim of the assessment is to provide a sufficient level of information to the competent authority on which to base their appropriate assessment of the plan or project.

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3.2 DESK STUDY

In order to complete the Natura Impact Statement certain information on the existing environment is required. A desk study was carried out to collate available information on the subject site's natural environment. This comprised a review of the following publications, data and datasets:

- OSI Aerial photography and 1:50000 mapping
- National Parks and Wildlife Service (NPWS)
- National Biodiversity Data Centre (NBDC) (on-line map-viewer)
- BirdWatch Ireland (BWI) data
- Geological Survey Ireland (GSI) area maps
- Environmental Protection Agency (EPA) water quality data
- NPWS, 2019. The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished Report, NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.
- Joint Nature Conservation Council (JNCC)
- Other information sources and reports footnoted in the course of the report

3.3 FIELD SURVEYS

A number of marine surveys were completed by specialist marine consultancies including Hydrographic Surveys Ltd and the IWDG (Irish Whale and Dolphin Group) Consulting. Relevant surveys were used to inform the screening for Appropriate Assessment and the Natura Impact Statement.

- Site Investigation Survey including Bathymetric and Topographic Survey (Hydrographic Surveys Ltd. 2019)
- Marine Mammal Risk Assessment (Berrow, 2019)

3.3.1 Site Investigation Survey including Bathymetric and Topographic Survey

A site investigation survey comprising bathymetric and topographic survey and surface marine grab sampling was undertaken by Hydrographic Surveys Ltd. and Priority Geotechnical Ltd. in the area around Glengarriff Pier and pontoon. Surface sediment grab samples, taken via Van Veen grab sampler, were collected at three locations (G1, G2 and G3) in October 2018 for the analysis of organics and contaminants (Hydrographic Surveys Ltd.).

3.3.2 Marine Mammal Risk Assessment (MMRA)

A risk assessment of the proposed works to marine mammals was carried out by the Irish Whale and Dolphin Group (IWDG) based on a review of available literature and data sources (Berrow, 2019).

3.3.3 Ecological Site Surveys

An otter survey was undertaken in inner Glengarriff Harbour on the 11th April 2019 on an ebbing tide from mid to low tide. The otter survey was undertaken following methodology outlined in 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (NRA, 2009). Evidence of otter (live animals, spraints, prints, resting places) was searched for along the coastline from 'Bamboo Park' in the east to west of Glengarriff pier including the outlet of the Reenmeen West River into Glengarriff Harbour and the small islets around the pier including Bush, Friar's and Bark Islands. The southern side of Bark Island was not accessible due to dense vegetation and steep shoreline. Evidence of otter, if present, was recorded and photographed and the position recorded using a Garmin eTrex 10 GPS/GNSS receiver.

Figure 1. Area of shoreline encompassed by the otter survey conducted on 11/01/2019

Waterbird counts were also undertaken in early 2019 by a Malachy Walsh and Partners staff ecologist at low and rising tides.

3.4 ASSESSMENT OF POTENTIALLY SIGNIFICANT EFFECTS

As set out in the NPWS guidance, the task of establishing whether a plan or project is likely to have an effect on a Natura 2000 site(s) is based on a preliminary impact assessment using available information and data, including that outlined above, and other available environmental information, supplemented as necessary by local site information and ecological surveys. This is followed by a determination of whether there is a risk that the effects identified could be significant. The precautionary principle approach is required.

Once the potential impacts that may arise from the proposal are identified the significance of these is assessed through the use of key indicators in the screening process:

- Habitat loss
- Habitat alteration
- Habitat or species fragmentation
- Disturbance and/or displacement of species
- Water quality and resource.

3.5 BRIEF OVERVIEW OF SCREENING FOR APPROPRIATE ASSESSMENT

A screening for Appropriate Assessment was carried out for the proposal. The full screening for Appropriate Assessment report is available in **Appendix 2**. The test for the screening for Appropriate Assessment is to assess, in view of best scientific knowledge, if the proposal, individually or in combination with other plans/projects is likely to have a significant effect on a Natura 2000 site. If there are any significant, potentially significant, or uncertain effects, it will be necessary to proceed to Appropriate Assessment and submit a NIS. Adopting the precautionary principle in identifying potentially affected European sites, all SACs and SPAs within the potential zone of influence of the proposal site were included.

The "zone of influence" for a project is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities (CIEEM, 2018). This is likely to extend beyond the site where there are ecological or hydrological connection(s) beyond the site boundaries.

The subject site and a distance of 15km is recommended as a potential zone of influence (Scott Wilson et al., 2006). However, National Parks and Wildlife Service (NPWS) guidance (NPWS, 2009) advises that this zone of influence be assessed on a case-by-case basis with consideration of the nature, size, and location of the projects, the sensitivities of the ecological receptors and the potential for cumulative effects. As such, Natura 2000 sites beyond 15km may also be considered based on the potential for an ecological and/or hydrological to the projects site, bearing in mind the precautionary principle and using the Source-Pathway-Receptor framework.

Following this, the potential impacts associated with the proposal will be identified before an assessment is made of the likely significance of these impacts.

Designated SAC and SPA sites within the potential zone of influence, or the zone of potential significant impact influence of the proposal site, including their proximity are shown in Error! Reference source not found. below.

Figure 2, below shows the location of these designated sites.

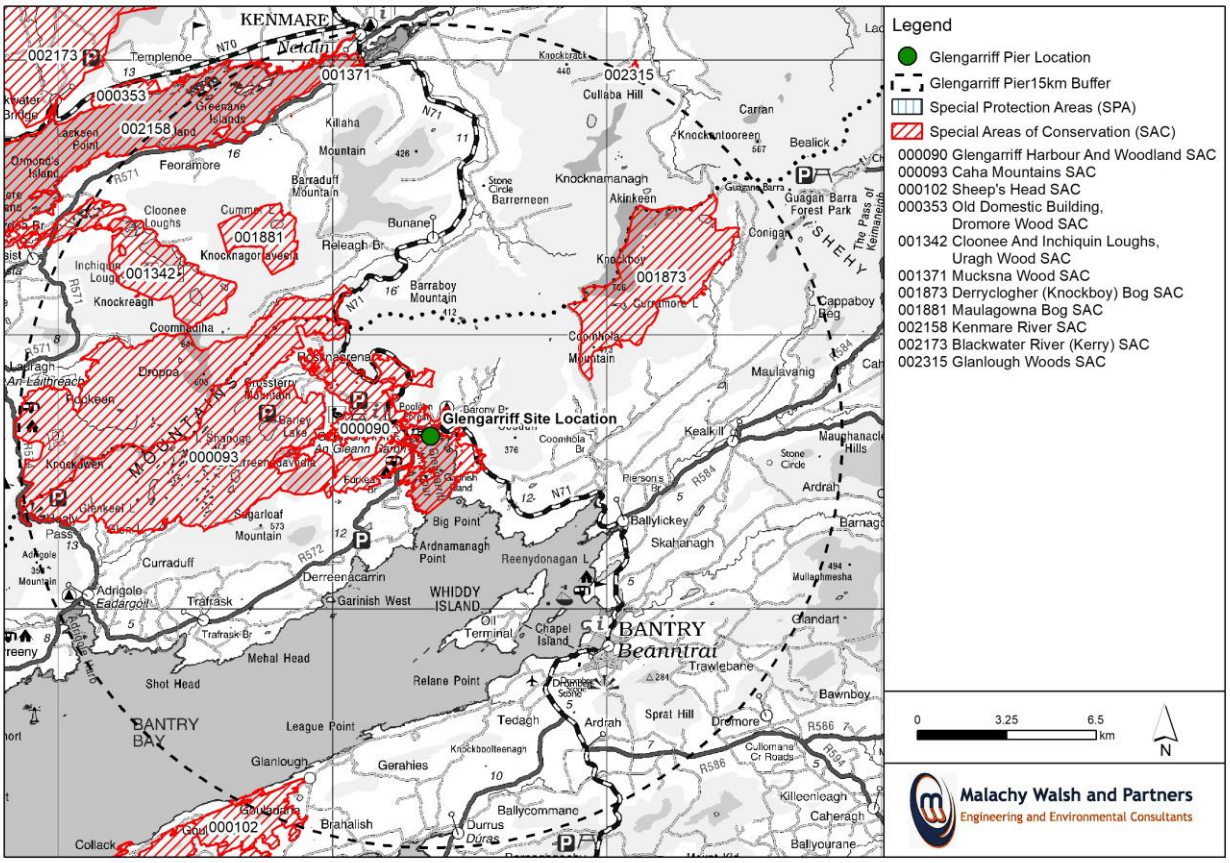

Figure 2 Natura 2000 sites located within the zone of influence of the site.

Table 1. Natura 2000 sites within 15km radius of the proposal site

No.	Designated Site	Site Code	Proximity of site to nearest point of designated site
1	Glengarriff Harbour & Woodlands SAC	000090	Proposed works located within the SAC.
2	Caha Mountains SAC	000093	Located 0.8km southwest of the subject site
3	Derryclogher (Knockboy) Bog SAC	001873	Located 6.3km northeast of the subject site
4	Maulagowna Bog SAC	001881	Located 8.2km northwest of the subject site
5	Clonee & Inchiquin Loughs SAC	001342	Located 8.6km northwest of the subject site
6	Glanlough Woods SAC	002315	Located 14.9km northeast of the subject site
7	Sheep's Head SAC	000102	Located 13.8km southwest of the subject site
8	Kenmare River SAC	002158	Located 13km west of the subject site

3.6 CONCLUSIONS OF THE SCREENING FOR APPROPRIATE ASSESSMENT

Potential impacts on seven of the eight Natura 2000 sites which occur within the likely zone of impact have been screened out due to a lack of credible or tangible source-pathway-receptor links between these sites and the proposal site. The comprehensive reasoning for this conclusion is available in the Screening for Appropriate Assessment appended to this report (**Appendix 2**).

The screening assessment concluded that water quality, species disturbance and/or displacement, habitat/species fragmentation, and potential in-combinations effects could not be ruled out for the Glengarriff Harbour and Woodlands SAC and therefore further assessment is required for this Natura 2000 site.

The focus of this NIS is to determine whether the proposed development will have a significant negative impact on the qualifying features (i.e. features of interest of the Natura 2000 site or reason for designation) of the Natura 2000 site identified in **Section 3.6** above.

This NIS identifies the environmental aspects of the project which may lead to significant impacts, and which may interact with the ecological requirements or sensitivities of the qualifying features of the Natura 2000 site listed in **Section 3.6** above. These aspects are primarily related to water quality, species disturbance and/or displacement impacts and potential in-combinations effects associated with the proposed dredging operations. The test of the assessment is whether the project will have 'an adverse effect on the integrity of the site'. Where potentially significant effects are identified, proven mitigation measures will be recommended.

4 DESCRIPTION OF THE PROJECT

4.1 BRIEF PROJECT DESCRIPTION, PURPOSE AND SITE LOCATION

Glengarriff Pier is located in Glengarriff Harbour just outside the village of Glengarriff on the Beara Peninsula in County Cork. The subject site is located approximately 75km west of Cork City and approximately 10km north of Bantry. The pier is accessed by a local road off the N71 national road heading east out of the village (see **Figure 3** below).

Figure 3. Glengarriff Proposed Site Location (Source: https://www.bing.com/maps/aerial accessed 09/08/2019)

Glengarriff pontoon is located adjacent to Glengarriff Pier. It is used by leisure and commercial users including passenger ferries to Garinish Island. The pontoon itself is connected via a walkway to Glengarriff Pier. The pontoon grounds and twists at low tide. Proposed dredging works aim to stop the current grounding and twisting and increase the amenity value of the pontoon. Proposed works include:

- The removal and replacement of the pontoon;
- Disconnection and reconnection of power and water supplies to the pontoon;
- Dredging of the channel and immediately around the pontoon to a depth of -4.5mODM (proposed dredge footprint is 900m^2);
- Disposal of dredged to an off-site licenced waste facility.

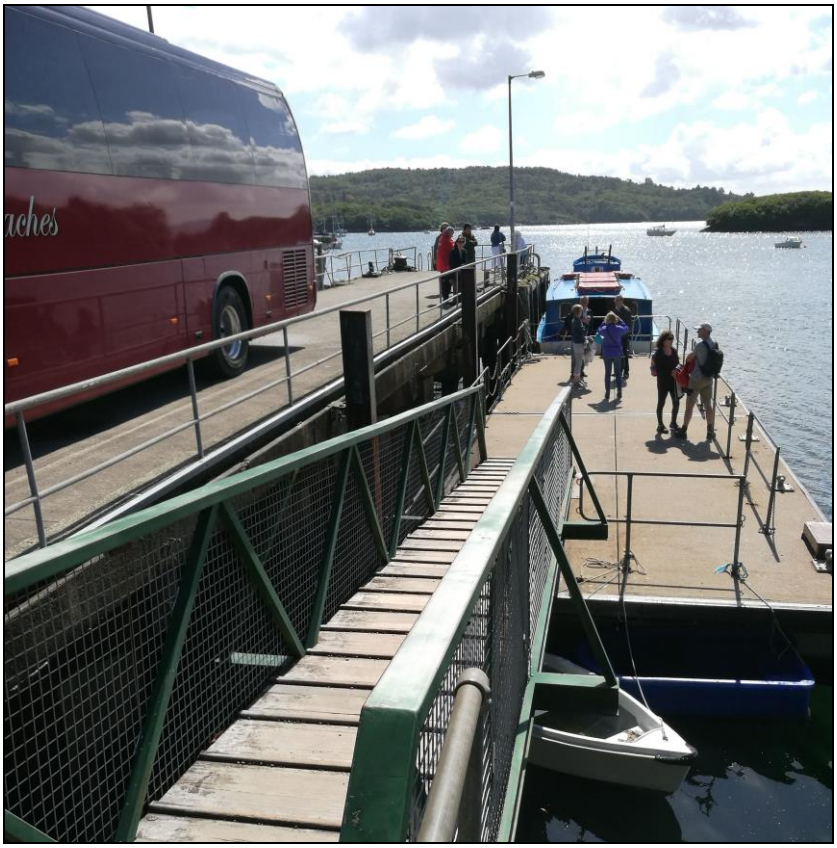

Plate 1. View of pontoon looking south-east from the gangway at Glengarriff Pier

Figure 4. Glengarriff Pontoon approximate dredge footprint

4.2 DESCRIPTION OF THE SITE

The proposed site of works is situated just outside the village of Glengarriff on the south coast of County Cork. Glengarriff is a coastal tourist centre, located on the N71 National Route between Kenmare and Bantry, overlooking the cove of Glengarriff Harbour. The harbour is comprised of approximately 4km^2 of sheltered waters set back from the more exposed coastal waters of Bantry Bay.

The subject area is located within the Electoral Division (ED) of Kilcaskan (CSO Area Code ED 18041). CSO data indicates that, in 2016, this ED had a total population of 755 person's resident[1]. The proposed site of works is situated in the townland of Monteensudder. Bedrock at the location and throughout the surrounding area is classified as 'Purple & Green Sandstone & Siltstone'. Soil type on the landward side of the pier is classified as 'Rock' and 'Peat'. The dominant Corine Landcover Category (2018) around Glengarriff Harbour in the general surrounding area is 'Broad-leaved forests' with 'Peat bogs' also occurring on the headland to the south-west of the pier.

Compliance with the reporting requirements of the Water Framework Directive (Directive 2000/60/EC) obliges each Member State to publish reports providing summary information about individual water bodies relating to their status, risks and objectives. Within this reporting framework, the site is located adjacent to the 'Glengarriff_SC_010' sub-catchment. Glengarriff Pier and pontoon is located within Glengarriff Harbour, which has a Transitional Waterbody WFD Status 2010-2015 of 'Unassigned'. Glengarriff Harbour has been assigned a Transitional Waterbodies Risk category of 'not at risk' and Transitional Water Quality 2010-2012 of 'Unpolluted'[2].

4.2.1 Site Investigation Survey including Bathymetric and Topographic Survey

The bathymetry survey conducted by Hydrographic Services Ltd. indicates that depths recorded in the vicinity of the pier and pontoon ranged from approximately -2.1ODM (eastern side of the pier) to approximately -4.3ODM (western side of the pier) (Hydrographic Surveys Ltd.).

Figure 5 below outlines the results of chemical analysis of the three surface-sediment grab samples taken within the proposal area.

[1] http://census.cso.ie [accessed 19/08/19]

[2] https://gis.epa.ie/EPAMaps/ [accessed 19/08/19]

Client: Priority Geotechnical Ltd			**Chemtest Job No.:**		18-35374	18-35374	18-35374
Quotation No.:			**Chemtest Sample ID.:**		723347	723348	723349
			Sample Location:		G1	G2	G3
			Sample Type:		SOIL	SOIL	SOIL
			Date Sampled:		31-Oct-2018	31-Oct-2018	31-Oct-2018
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	51	65	58
Arsenic	U	2450	mg/kg	1.0	23	15	17
Barium	U	2450	mg/kg	10	36	16	17
Cadmium	U	2450	mg/kg	0.10	0.67	0.93	1.1
Chromium	U	2450	mg/kg	1.0	32	34	36
Molybdenum	U	2450	mg/kg	2.0	5.6	14	16
Antimony	N	2450	mg/kg	2.0	< 2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	200	44	52
Mercury	U	2450	mg/kg	0.10	0.19	0.15	0.18
Nickel	U	2450	mg/kg	0.50	32	29	32
Lead	U	2450	mg/kg	0.50	49	27	34
Selenium	U	2450	mg/kg	0.20	1.2	2.5	3.0
Zinc	U	2450	mg/kg	0.50	330	210	210
Mineral Oil	N	2670	mg/kg	10	84	< 10	< 10
Total TPH >C5-C40	N	2670	mg/kg	10	120	< 10	< 10
Dibutyl Tin	N	2730	µg/kg	10	< 10	< 10	< 10
Tributyl Tin	N	2730	µg/kg	10	< 10	< 10	< 10

Figure 5. Results of chemical analysis of surface sediment grab samples (G1, G2 and G3) (Hydrographic Surveys Ltd.)

4.2.2 Ecological Site Surveys

No otters were observed during the course of the otter survey carried out on-site in April 2019. While not unexpected as otters are mainly active during dusk and night time, a desk-top study determined that there have been a number of sightings of live otter in inner Glengarriff Harbour. Additionally, a sighting of an otter was made east of Bush Island during a bird survey for Malachy Walsh and Partners on 28th January 2019. The otter survey yielded abundant evidence of otter activity across the study area.

One potential holt was recorded on the shoreline at the eastern end of the study area near 'Bamboo Park', approximately 270m north-east of the pier on the opposite side of the harbour. This feature consisted of a tunnel into soft sediments overlying the bedrock under a tree. Additional evidence of otter in the form of spraints was also recorded close by. No other holt features were recorded within the study area, including the islets located off-shore of the pier, during this survey.

Numerous couches and temporary resting place features were recorded across the study area, including within the vicinity of the pier. In addition, couch and temporary resting place features were recorded on all three islets just off-shore of Glengarriff Pier suggesting that these areas are regularly used as feeding and resting areas. Spraints and sprainting sites were frequently recorded within the survey area, often in association with the other features above. Spraints were also found on the pier structure including a large accumulation comprising fish scales, bones and crab fragments on a concrete beam under the main concrete slab of the pier (see **Plate 2** below).

Plate 2. Accumulation of otter spraints recorded on concrete beam of pier structure during otter survey

Based on the results of the otter survey, it is considered that inner Glengarriff Harbour is highly suitable for otter. The evidence suggests that otter are active in all parts of the inner harbour including on the pier with temporary resting places recorded very close to the structure. Landscape features that increase the suitability of the area for otter includes two rivers, the Glengarriff and the Reenmeen West, which enter the bay to the west and east of the pier, respectively. In addition, there is an abundance of suitable foraging habitat and numerous areas for otters to rest and shelter with dense woodland and scrub coming right down to the inter-tidal zone at many locations across the study area and harbour. Furthermore, un-inhabited islets with dense undergrowth located just off-shore of the pier (particularly Friar Island and Bark Island) provide ideal foraging and resting habitat for otters free of disturbance.

The otter survey summary report, including more detailed survey results, is included in **Appendix 2**.

4.3 CHARACTERISTICS OF THE PROJECT

Table 2 provides a summary of the characteristics of the project. The proposal has been confirmed with the project engineer.

Table 2. Summary of Project Characteristics

Size, scale, area, land-take	Glengarriff pontoon is located adjacent to Glengarriff Pier just outside Glengarriff village. The proposed works will be restricted to the existing pontoon and the surrounding dredge pocket. The proposed dredge footprint is approximately 900m^2. The proposed works overlap with the Glengarriff Harbour and Woodland SAC (000090). There will be no land-take within the SAC.
Details of physical changes that will take place during the various stages of implementing the proposal	Proposed works include: • The removal and replacement of the pontoon; • Dredging of the channel and immediately around the pontoon to a depth of -4mODM; • The proposed dredge footprint is 900m^2. • Disposal of dredged materials to an off-site licenced waste facility. Initial works will require the removal and storage on-site of the existing pontoon. This will be done using a crane or excavator. Dredging works will be carried out by a long reach excavator operating from a barge or from land as necessary. Spoil will be loaded onto trucks and will then be taken off-site to a licenced waste facility. Once dredging works are complete, the barge (if required) and excavator will leave the site. The pontoon, removed at the project commencement, will be returned reinstalled in its original location.
Description of resource requirements for the construction/operation and decommissioning of the proposal (water resources, construction material, human presence, etc)	The equipment and resources required for the works will include: • Crane for removing and reinstating pontoon; • Barge to facilitate dredging; • Safety boat; • A long-reach excavator; • On-site personnel; • Trucks: These vehicles would be used to bring construction materials to site and to remove any dredge spoil from site. These vehicles will also be used to relocate the pontoon.
Description of timescale for the various activities that will take place as a result of implementation (including likely start and finish date)	• Proposed works should take a total of 1 to 2 weeks, including site set-up and demobilization. • Likely start date will be dependent on seasonal constraints.
Description of wastes arising and other residues (including quantities) and their disposal	• Dredge spoil will be the only significant waste generated on site. This spoil will be removed from the site and disposed of at a licenced waste facility. • Fuel/oil/lubricants associated with the barge (if used)/excavator/truck. • Wastes will not be left on or adjacent to the pier. • All waste will be removed off site to an appropriate licenced waste facility.

Identification of wastes arising and other residues (including quantities) that may be of particular concern in the context of the Natura 2000 network	• A portion of dredge material is considered marginally contaminated. Marine sediment sample parameters that lie within Class 2 include arsenic, cadmium, nickel and zinc. One sample exceeded the upper guidance limit for copper (Class 3). With the exception of arsenic, cadmium, copper, nickel and zinc all other parameters are below the lower Irish action limit within the proposed dredge area. All dredge spoil will be removed from site for disposal at an off-site licenced waste facility. • Fuels and oils will be present which pose a risk to Natura 2000 sites were a fuel spill or oil leak to occur. All fuels/oils will be stored within the temporary site compound.
Description of any additional services required to implement the project or plan, their location and means of construction	• A temporary site compound will be located adjacent to the Glengarriff pier.

4.4 IDENTIFICATION OF OTHER PROJECTS OR PLANS OR ACTIVITIES

4.4.1 Plans

Plans identified relevant to the subject area include:

- Cork County Council Development Plan 2014
- Cobh and West Cork Municipal District Local Area Plan 2017
- North and West Cork Strategic Plan 2012 – 2020

4.4.2 Existing Pier Operations

Glengarriff Pier is the base for a number of leisure and commercial vessels including passenger ferries to Garinish Island. There is a possibility that leisure/commercial boat activity may occur at the same time as the proposed works.

4.4.3 Current/Outstanding Grants of Planning Permission

A search of current planning applications within the adjacent townland of Monteensudder was carried out using the Cork County Council online planning system. This search determined that there are six granted/outstanding planning applications mainly relating to residential dwellings and retention permission for telecommunications infrastructure in the general area[3].

4.4.4 Licensed Activities

A search of the EPA's on-line mapping system determined that there are no IPC, IEL or waste licensed facilities within proximity of the subject site.

A licensed wastewater treatment plant is located in Glengarriff village (Agglomeration PE of 500 to 1,000) (Licence No. D0471). The existing treatment plant is located 250m west of the pier, between the main road and the shoreline. The treatment process is a primary sedimentation system (septic tank). The septic tank has a capacity of 209m^3, which equates to a design PE of 1,000 PE. The predicted PE for 2015 is approximately 990. Irish Water (IW) has plans for a proposed new WWTP which will cater for a population equivalence of 2,500[4]. This WWTP has an overall plant compliance of 'Fail' due to lack of secondary treatment[5].

[3] http://maps.corkcoco.ie/planningenquiryv3/MainFrames.aspx [accessed 19/08/2019]

[4] http://www.epa.ie/licences/lic_eDS/090151b2804f35a8.pdf [accessed 19/08/2019]

[5] https://gis.epa.ie/EPAMaps/ [Accessed 19/08/2019]

In light of the characteristics of the subject site and its surrounds as outlined in **Section 4.2** above, and considering the size and scale of the proposal as outlined in **Section 4.3** above, it is concluded that there is potential for interaction between the aforementioned activities and the proposal, therefore the potential to create in-combination effects on the receiving environment must be assessed. This aspect will be considered in **Section 5.3** below. Identification of Natura 2000 sites

4.5 NATURA 2000 SITES

It has been concluded during the screening stage that the proposed works may potentially impact on one Natura 2000 site located within 15km of the proposal site, namely:

- Glengarriff Harbour and Woodland SAC

When Natura 2000 sites are selected for stage 2 assessment, then all the qualifying features of conservation interest must be included in that stage of the assessment. However, when assessing impact, qualifying features are only considered relevant where a credible or tangible source-pathway-receptor link exists between the proposed development and a protected species or habitat type. In order for an impact to occur there must be a risk initiated by having a 'source' (e.g. dredging activity), a 'receptor' (e.g. a protected species or habitat), and an impact pathway between the source and the receptor (e.g. a waterbody). Identifying a risk that could, in theory, cause an impact does not automatically mean that the risk event will occur, or that it will cause or create an adverse impact. However, identification of the risk does mean that there is a latent possibility of ecological or environmental damage occurring, with the level and significance of the impact depending upon the nature of the risk, the extent of the exposure to the risk and the characteristics of the receptor.

Therefore, bearing in mind the scope, scale, nature and size of the project, its location relative to the distribution of the species and habitats listed and the degree of connectedness that exists between the project and the potential receptors, it is considered that not all of them are within the likely zone of impact of the proposal. An evaluation based on these factors to determine which species and habitats are the plausible ecological receptors for potential impacts of the unmitigated proposal has been conducted in **Section 4.4.1.2** below**.** This evaluation has determined that certain species (listed in **Table 3** below) should be selected for further assessment as plausible ecological receptors.

4.5.1 Glengarriff Harbour & Woodlands SAC (000090)

4.5.1.1 Description of the Natura 2000 Site

Located to the south and north-west of Glengarriff Village in west Cork, this site consists of a glacial valley opening out into a sheltered bay with rocky islets. The valley contains old oak woodland and alluvial forest. The underlying rock of the area is Old Red Sandstone, with the soil varying from acid brown earths to alluvial brown earths and peat (NPWS, 2013).

Glengarriff woodland consists of a sizeable area of broadleaved semi-natural woodland comprised of oak (*Quercus* sp.) and Holly (*Ilex aquifolium*), with much Downy Birch (*Betula pubescens*) and Rowan (*Sorbus aucuparia*). Wet woodland occurs along parts of the Canrooska and Glengarriff rivers. This is dominated by willows (mainly *Salix cinerea* subsp. *oleifolia*) and Downy Birch, with Alder (*Alnus glutinosa*) also frequent. In addition to the woodlands, the harbour is of great interest. This sheltered inlet of Bantry Bay has a rocky shore vegetated with brown seaweeds. The inlet also features rocky islets. Overall, the site supports a diversity of fauna.

The rocky islets in the harbour support the largest colony of Common Seals (*Phoca vitulina*) in the south-west of Ireland (maximum count of 151 in the all-Ireland survey of 2003). This legally protected species is listed on Annex II of the E.U. Habitats Directive. Summer roosts for Lesser Horseshoe Bat (*Rhinolophus hipposideros*), also an Annex II species, have been found in three buildings within the SAC boundary. Bats have also been confirmed hibernating in one of the buildings. This site is of international importance for both summer roosting and hibernating Lesser Horseshoe Bats. Given the combination of winter, summer and foraging sites, the site is one of the most important for the species in the south-west. The woods, and the river flowing through it, are home to a range of other mammal species, including Otter (*Lutra lutra*) (listed in Annex II of the E.U. Habitats Directive). Kerry Slug (*Geomalacus maculosus*), a legally protected species listed on Annex II of the E.U. Habitats Directive, also occurs within the site.

The harbour supports mariculture (rope grown mussels) and tourism industries (boats visiting Garinish Island). Neither activity appears to have affected seal numbers, although increased disturbance may pose a threat. This site is of importance because it is the only sizeable area of old oak woodland remaining in west Cork and is considered second only to Killarney as an example of Oceanic Sessile Oak/Holly woodlands. Furthermore, the site supports populations of a number of animal species listed on Annex II of the Habitats Directive (NPWS, 2013).

Conservation objectives for Glengarrif Harbour and Woodlands SAC were obtained from the following source:

NPWS (2015) Conservation Objectives: Glengarriff Harbour and Woodland SAC 000090. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

4.5.1.2 Identification of Potential for Significant Impacts to Qualifying Features

The following table **(Table 3)** lists the qualifying features of the Glengarriff Harbour and Woodland SAC and evaluates through a scientific examination of evidence and data whether or not these features should or should not be selected for further assessment in the NIS. The qualifying features that are selected for further assessment are discussed further in the section followed by an assessment of potentially significant effects arising from the proposal.

Table 3. Qualifying features of Glengarriff Harbour & Woodlands SAC selected for further assessment – Source: NPWS (2015) Conservation Objectives: Glengarriff Harbour and Woodland SAC 000090. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Qualifying Feature	Potential for Significant Adverse Effects	Rationale
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	*No*	• Nature and location of the works (dredging in marine zone) • Terrestrial woodland habitat • No spatial overlap or potential impact pathway • No potential for significant effects
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae,*	*No*	• Nature and location of the works (dredging in marine zone) • Terrestrial/riparian woodland habitat • No spatial overlap or potential impact pathway

Qualifying Feature	Potential for Significant Adverse Effects	Rationale
Salicion albae) [91E0]		• No potential for significant effects
Geomalacus maculosus (Kerry Slug) [1024]	*No*	• Nature and location of the works (dredging in marine zone) • Habitats at proposal site not suitable for this terrestrial species • No potential for significant disturbance or displacement effects
Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303]	*No*	• Nature and location of the works (dredging in marine zone) • Small scale of the works • Works will be restricted to daytime hours • No potential for significant disturbance or displacement effects
Lutra lutra (Otter) [1355]	*Yes*	• Habitats at and within the vicinity of the proposal site are suitable for otter • Previous species records and otter survey results indicate that otter are active in the vicinity of the proposed works • Potential exists for direct/indirect disturbance/displacement impacts to otter during the works
Phoca vitulina (Harbour Seal) [1365]	*Yes*	• Habitats at and within the vicinity of the proposal site are suitable for harbour seal • Previous species records for harbour seal in the vicinity of Glengarriff Pier • Potential exists for direct/indirect disturbance/displacement impacts to harbour seal during the works

4.5.1.3 Qualifying Features Selected for Further Assessment

4.5.1.3.1 Otter (*Lutra lutra*)

Otter are widespread in Ireland throughout freshwater and coastal habitats with their preferred habitat including good vegetation cover. Otters are largely solitary animals, occurring at low population densities. They are highly territorial towards members of the same sex, so although this means ranges of males and females can overlap; it has implications for the number of otters which will potentially occupy a given stretch of waterway. Home ranges can comprise 20km of watercourse for females and in excess of 32km for males. A key requirement of potential territory is a sufficient source of prey. Otters feed primarily on fish and the amount of time spent in different parts of their home-range is related to the abundance of prey.

Otters are mainly nocturnal creatures and so require safe refuges, known as holts, in which to rest during the day. These holts are the main den sites and are often situated underground along a river bank or under tree roots. An otter's territory will typically contain several holts as well as temporary resting sites, known as couches. These are above-ground lying-up areas concealed within vegetation

and often linked to a nearby watercourse by a regularly-used track. Therefore, the presence of freshwater, a sufficient prey-base and suitable sites for holts/couches are key factors in determining otter distribution. In Ireland the overall assessment of Conservation Status for this species is 'Favourable' (NPWS, 2013b).

The conservation objective for the Glengarriff Harbour and Woodland SAC in relation to otter is to maintain the species favourable conservation condition, as defined by specific attributes and targets. **Figure 6** below shows the extent of otter commuting habitat within Glengarriff Harbour as per Conservation Objective mapping for the SAC.

Table 4 below outlines the attributes and targets for otter based on the conservation objectives which have been prepared for Glengarriff Harbour and Woodland SAC (NPWS, 2015).

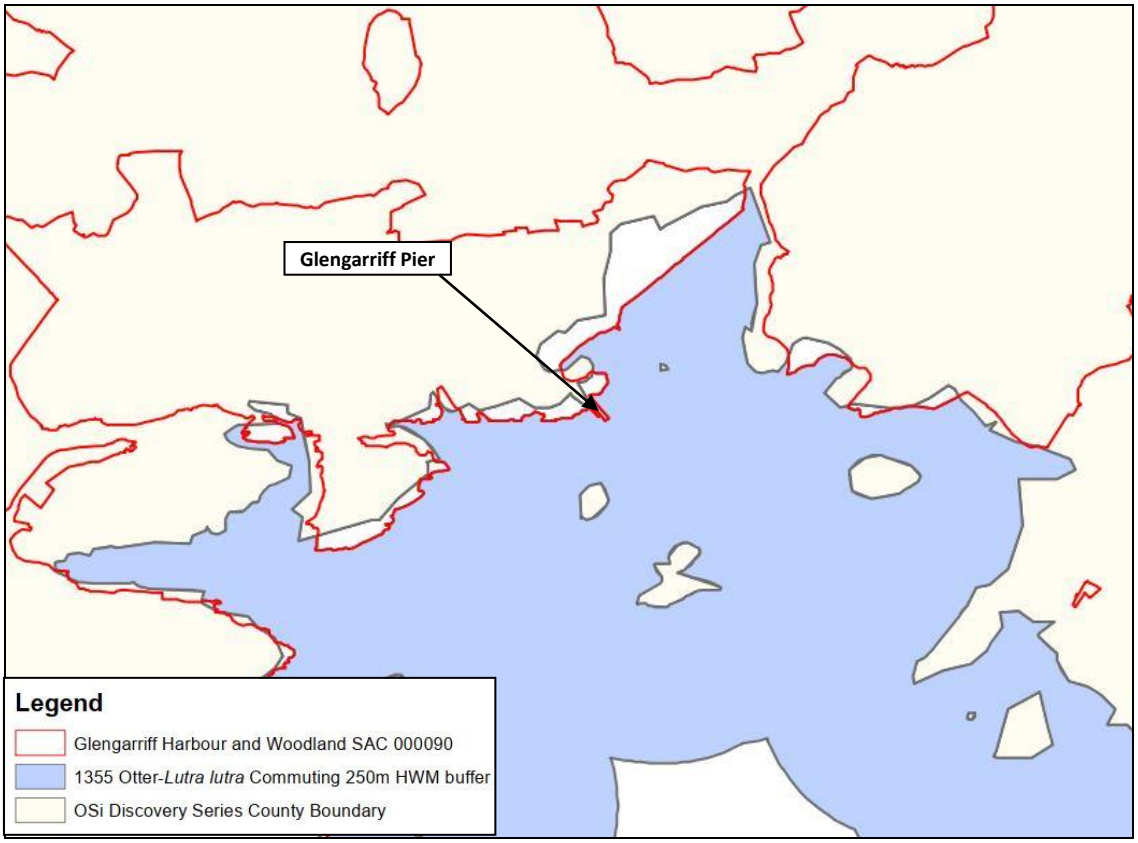

Figure 6. Extent of otter commuting habitat within the vicinity of Glengarriff Pier in the Glengarriff Harbour and Woodland SAC (NPWS, 2015)

Table 4. Specific conservation objective Attributes and Targets for otter in Glengarriff Harbour and Woodland SAC (000090)

Attribute	Measure	Target
Distribution	Percentage positive survey sites	No significant decline
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 56ha
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 137ha
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped a calculated as 23.5km
Extent of freshwater	Hectares	No significant decline. Area mapped

Attribute	Measure	Target
(lake/lagoon) habitat		and calculated as 2ha
Couching sites and holts	Number	No significant decline
Fish biomass available	Kilograms	No significant decline
Barriers to connectivity	Number	No significant increase.

The most recent assessment for this species determined that the 10km grid square, V95, in which the proposed development is located, is included within the current known range and distribution for this species (NPWS, 2013b). A review of otter records held by the NBDC and available on-line determined that there are several records for otter within the vicinity of Glengarriff Pier. These relate to sightings of live animals[6]. During an otter survey conducted within inner Glengarriff Harbour in support of this application, abundant evidence of otter activity was found in the vicinity of the pontoon, the surrounding shoreline and nearby off-shore islands. Based on this evidence otter are likely to occur in the vicinity of the works and so could be susceptible to either direct/indirect disturbance/displacement impacts as a result of the proposal.

4.5.1.3.2 Harbour Seal (*Phoca vitulina*)

Harbour seals can be found in both in-shore and off-shore waters. In Ireland, the species distribution is concentrated mainly along the west coast, although some areas along the south and east coast are also included. Harbour seals, also known as common seals, are associated with sheltered bays and coastline as well as estuaries. They occupy traditional 'haul-out' sites, typically inter-tidal areas, for resting, moulting, breeding and other social activities. The breeding season of harbour seal commences in May and lasts until approximately July (NPWS, 2013). Seals rely on sound to navigate, communicate and interpret sensory cues. Seals hearing ranges from 75Hz to 75kHz in water and 75Hz to 30kHz out of water (DAHG, 2014). During the most recent assessment of conservation status for Ireland's species, the overall assessment for harbour seal was found to be 'Favourable' (NPWS, 2013).

Glengarriff Harbour is a very important site for harbour seals with the SAC encompassing several resting, breeding and moulting sites within its boundary. Heardman et al. (2006) as cited in Berrow (2019) carried out a review of survey data from Glengarriff Harbour over the period 1985 to 2004 and reported peak counts of between 135 and 403 individuals. There has been a significant increase in harbour seal counts over this period with most seals hauled out to the east of Garinish Island and on rocks close to the eastern and western shores of the outer harbour (Heardman et al., 2006 as cited in Berrow, 2019). Seals occurred throughout the year with peak counts always recorded between August and September. Harbour seal pups occurred in June and July. Harbour seals are also frequently recorded hauled out outside the harbour throughout inner Bantry Bay (Cronin et al., 2004 as cited in Berrow, 2019). Harbour seals have the potential to occur in the vicinity of the works and so could be susceptible to either direct/indirect disturbance/displacement impacts as a result of the proposal.

The conservation objective for the Glengarriff Harbour and Woodland SAC in relation to harbour seal is to maintain the species favourable conservation condition, as defined by specific attributes and targets. **Figure 7** below shows the extent of harbour seal habitat, including breeding, resting and moulting sites within the vicinity of Glengarriff Pier in Glengarriff Harbour and Woodland SAC.

[6] https://maps.biodiversityireland.ie/Map [accessed 19/08/2019]

Table 5 below outlines the attributes and targets for harbour seal based on the conservation objectives which have been prepared for Glengarriff Harbour and Woodland SAC (NPWS, 2015).

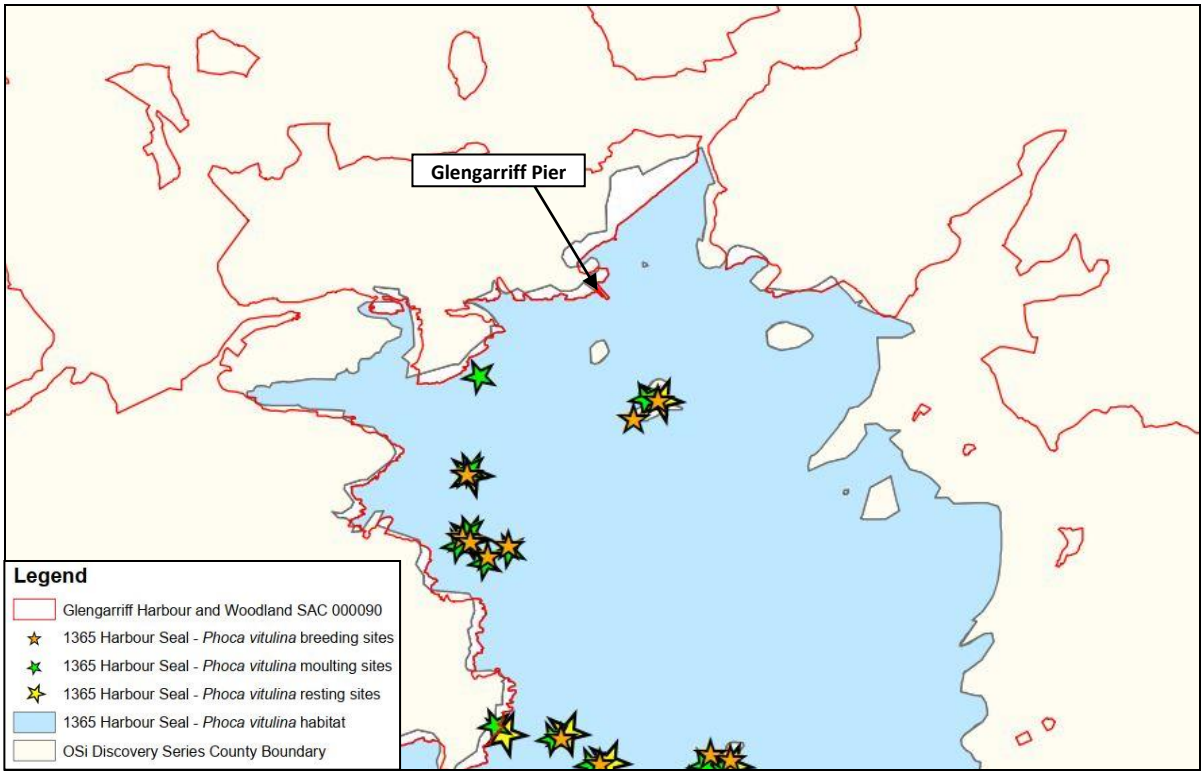

Figure 7. Extent of harbour seal habitat, including breeding, resting and moulting sites within the vicinity of Glengarriff Pier in Glengarriff Harbour and Woodland SAC (NPWS, 2015).

Table 5. Specific conservation objective Attributes and Targets for harbour seal in Glengarriff Harbour and Woodland SAC (000090)

Attribute	Measure	Target
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use
Breeding behaviour	Breeding sites	The breeding sites should be maintained in a natural condition
Moulting behaviour	Moult haul-out sites	The moult haul-out sites should be maintained in a natural condition
Resting behaviour	Resting haul-out sites	The resting haul-out sites should be maintained in a natural condition
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site

5 ASSESSMENT OF POTENTIALLY SIGNIFICANT IMPACTS

There follows an evaluation of significance of potential impacts of the proposed project on the qualifying features that have been selected for impact assessment. This section considers the habitats and species identified in the preceding section together with any potential impacts, and determines whether the proposed works are likely to have significant effects on any of the Natura 2000 sites designated for the protection of the qualifying features selected.

The likelihood of adverse effects to each Natura 2000 site from the project was determined based on a number of indicators including:

- Habitat loss and/or alteration
- Water quality
- Disturbance and/or displacement of species
- Habitat or species fragmentation

The likelihood of significant in-combination effects is assessed in **Section** Error! Reference source not found.**5.3** below.

5.1 WATER QUALITY

There are several aspects of the proposal which could potentially result in impairment of marine water quality within the Glengarriff Harbour and Woodland SAC. Potential water quality effects arising as a result of the proposal include increases in the volume of sediment suspended in the water column, resulting in increased turbidity and sedimentation, and an increased risk of release of contaminants into the marine environment from either benthic sediments or anthropogenic sources. These impacts are considered to have the most potential to occur during dredging activity.

Dredging of the seabed (approx. dredge footprint 900m^2) in the immediate vicinity of the pontoon will be carried out by a long-reach excavator operating from either a barge or from land. Spoil removed will be transported to a waiting truck for removal off-site. Disturbance and removal of the bed during dredging activity will result in an increase in suspended sediment concentration and turbidity in the general area. There is also the potential for accidental spillage of material while being transported to the truck. Any sediment which does become re-suspended into the water column through these activities will eventually settle out resulting in sedimentation in either the general area or potentially elsewhere due to dispersion as a result of natural tidal processes within the area.

With regards to re-suspension of material during dredging activity, it is estimated that a relatively low percentage volume of sediment will be lost to the water column given the small scale and nature of the works. While dredging will result in an increase in turbidity levels this impact will be temporary and is expected to be localised to the dredge pocket and surrounding area. It is predicted that the greatest increase in suspended sediment concentration will occur in the immediate vicinity of the proposed dredge area. Some of this re-suspended material may move with currents eventually settling out within the surrounding estuary. Concentrations of suspended sediment are expected to lower significantly with distance from the dredging operation as material naturally settles out.

Disturbance of the seabed during dredging has the potential to result in the release of contaminants or harmful substances from substrates, particularly silts and clays, to the aquatic environment. Mobilisation of chemicals/toxins previously deposited on the seafloor and released into the water column via disturbance (dredging) can have negative consequences for water quality and marine ecosystems. According to Cronin *et al.* (2006), marine sediments are not, in themselves, polluting substances. Rather, they can be a sink for contaminants that end up in harbours and ports mainly from anthropogenic sources such as sewage discharges, marine traffic, industrial wastewater and historically poor environmental management (Cronin *et al.* 2006).

There are no current or historic heavy industries, boat building or repair activities associated with Glengarriff Pier. The principal sources of pollutants at the site would potentially be hydrocarbons associated with vessels, machinery and equipment. The substances that are considered of most concern for the marine environment are those with combined properties of persistence, toxicity and liability to bio-accumulate (PTB). Typically, the most important contaminants associated with dredged material from a water quality perspective include organotin compounds, heavy metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) and oils. The Marine Institute (MI) provide Upper and Lower action levels to assess the suitability of sediments for disposal at sea. These values do not apply directly in this case given that dredged material will be removed to an off-site facility. However, they can provide some indication of the level of contamination that is acceptable in the small-scale dispersal of secondary sediment.

With regards to the potential release of contaminants from sediments into the surrounding environment, it is noted that the material to be dredged has been determined, following sampling, to be marginally contaminated with arsenic, cadmium, nickel and zinc. One of the sampling stations was heavily contaminated with copper.

Arsenic values were between the lower and upper guidance levels at all stations ranging from 17mg/kg to 23mg/kg. None of the sampling stations exceeded the upper Irish action level for arsenic of 70mg/kg. Arsenic can occur naturally within bedrock; therefore, sediments within the dredge site are not considered to pose any risk of significant adverse effects to marine water quality. Cadmium exceeded the lower Irish action level of 0.7mg/kg at two of the three sampling stations. None of the sampling stations exceeded the upper Irish action level for cadmium of 4.2mg/kg. Nickel exceeded the lower Irish action level of 21mg/kg at all three sampling stations. None of the sampling stations exceeded the upper Irish action level for nickel of 60mg/kg. Zinc exceeded the lower Irish action level of 160mg/kg at all three sampling stations. None of the sampling stations exceeded the upper Irish action level for zinc of 410mg/kg. Copper values exceeded the lower guidance level of 40mg/kg at two of the three sampling stations. Cooper exceeded the upper guidance level of 110mg/kg at one sampling station (G1) (Hydrographic Surveys Ltd.).

In summary, the majority of the parameters tested in the three samples were not found to exceed the lower guidance limits set by the Marine Institute (MI) for disposal at sea. Sediment sampled from stations G2 and G3 did however exceed the lower guidance limits for arsenic, cadmium, nickel and zinc. Based on these results the sediments sampled from G2 and G3 can be considered Class 2 sediments. Class 2 sediments hold contaminant concentrations between Level 1 and Level 2 and are considered marginally contaminated (Cronin *et al*., 2006).

Sediment sampled from station G1 exceeded the MI lower guidance limits for arsenic, nickel and zinc. This sample also exceeded the upper Irish action limit for copper. Based on the results the sediment sampled from station G1 can be considered Class 3 sediment. Class 3 sediments hold contaminant concentrations between Level 2 and Level 3 and are considered heavily contaminated (Cronin *et al*., 2006) with regards to disposal of dredge spoil at sea.

In relation to the potential for impairment of marine water quality as a result of release of contaminants from sediments it is noted that all dredge spoil is to be removed and transported off-site for disposal at a licenced waste facility. There will be no disposal of dredge spoil within Glengarriff Harbour or within the boundary of the Glengarriff Harbour and Woodland SAC.

The presence of a barge, if used, will increase the risk of fuel/oil spill into surrounding waters were an accidental spillage to occur. Similarly, the use of such substances for trucks and the excavator in close proximity to the marine zone could potentially lead to pollution of the aquatic environment and subsequent adverse impacts to qualifying features. In relation to these potential water quality impacts it is noted that any fuel/oils will be stored in the temporary site compound. There will be no re-fuelling of machinery within the marine zone. With regard to use of the barge, if required, standard best practice guidelines will be adhered to such that the risk posed by such substances to the marine environment is minimised. In the normal course of events, significant fuel leaks are not a common occurrence. Thus, the risk of significant pollution of marine waters with fuel or oils from the project is considered low.

In summary, the works will result in localised disturbance of sediment on the seabed within the vicinity of the pontoon as a result of dredging activity. Any sediment which does become re-suspended during dredging or transfer to the trucks will either settle out in the area of the pier or will disperse on the ebbing tide eventually settling out of suspension. In relation to the disposal of dredge spoil, all dredged material will be removed off-site to a suitably-licensed facility for disposal.

The proposed works are being undertaken to prevent the pontoon from twisting and grounding at low tide and improve the amenity value of the existing structure. Following dredging works, the pontoon will be reinstated to its original location. Existing levels of activity are not expected to significantly increase following re-instatement of the pontoon after the works. Therefore, the proposed works are not considered to have any potential for significant water quality impacts following the dredging phase.

Bearing the above factors in mind, it is therefore objectively concluded that significant water quality impacts to the Glengarriff Harbour and Woodland SAC are not expected to occur as a result of the proposal. However, based on the precautionary principle, certain mitigation measures regarding protection of water quality are recommended and are included in **Section 6** below.

5.2 DISTURBANCE AND/OR DISPLACEMENT OF SPECIES

5.2.1 Harbour Seal (*P. vitulina*)

Glengarriff Harbour and Woodland SAC is designated to protect the breeding and resting places of harbour seal. The main threats to harbour seal, defined as being of medium importance, are fishing and harvesting of aquatic resources and seismic explorations/explosions. Illegal taking of marine fauna, marine water pollution, noise nuisance/pollution, changes in abiotic conditions, marine and

freshwater aquaculture and outdoor sports/recreational activities are considered to be of low importance (NPWS, 2013).

"*Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*", produced by the DAHG in 2014, has outlined several specific maritime activities that are sources of introduced sound and which potentially pose risks to marine mammals, although in any case sound-producing activities may be variable and case-specific. These activities include dredging, drilling, pile driving, geophysical acoustic surveys and blasting, (DAHG, 2014).

Potentially significant impacts to marine mammals associated with anthropogenic sources of sound underwater in general may include the following, according to the DAHG (2014):

- Physical (Non-auditory):
    - Damage to body tissue
    - Induction of gas embolism or decompression sickness
- Physical (Auditory):
    - Gross damage to ears
    - Permanent threshold shift (PTS) in hearing
    - Temporary threshold shift (TTS) in hearing
- Perceptual:
    - Masking of communication, other biologically important sounds
    - Interference with ability to acoustically interpret environment
- Behavioural:
    - Gross interruption of normal behaviour
    - Behaviour modified
    - Displacement from an area (short or long term)
    - Disruption of social bonds, including mother-young associations
- Chronic/Stress:
    - Increased vulnerability to disease
    - Increased potential for impacts from negative in-combination effects
    - Sensitisation to sound
    - Habituation to sound
- Indirect Effects:
    - Reduced availability of prey
    - Increased vulnerability to predation
    - Behavioural changes leading to physical damage and/or physiological effects

According to the MMRA produced in support of this application, harbour seals have been found to occur throughout the year in Glengarriff Harbour with peak counts always recorded between August and September. Harbour seal pups were found to be present in the months of June and July (Berrow, 2019). Given that the proposal site is located within the SAC and considering their mobile nature and the regularity of previous sightings, harbour seal have the potential to occur in the vicinity of Glengarriff Pier during the works.

According to the MMRA, the ambient noise level in Glengarriff Harbour is not known; however, it is expected to be dominated by environmental noise (e.g. tidal movement of water and sediment, and

wind and wave noise) and local small vessel traffic. While sound exposure levels from dredging operations are thought to be below that expected to cause injury to a marine mammal, disturbance, from the noise generated by dredging, from the physical presence of the dredger, and possibly from the increased water turbidity in the area of operations have the potential to cause lower level disturbance, masking or behavioural impacts (DAHG, 2014). In relation to disturbance via increased traffic, the presence of a barge and excavator may lead to a minor localised increase in vessel traffic and associated noise. However, the presence of an additional small vessel and the associated low-frequency noise produced is very unlikely to have a significant impact on harbour seals. In the area harbour seals in particular have been shown to exhibit a very high tolerance to chronic noise.

With regards to noise impacts, according to the MMRA, localised disturbance to marine mammals in the works area may occur during operations, but will be limited by:

- The inshore location of the site, close to the harbour entrance. Any marine mammals recorded will be accommodated to human activities. Noise transmission to the wider bay is very unlikely.
- The very shallow nature of the dredging site.
- The regular transit of fishing and recreational vessels.
- The relatively short duration of the planned activity of 1-2 weeks.
- Although pupping by harbour seals occurs between June and July the potential disturbance is very low and localised and will not affect pupping or haul out sites (Berrow, 2019).

Considering this, although seals may be exposed to some disturbance if they are in the water near the dredging operations, this is not expected to cause significant disturbance. While there may be temporary disturbance to seals in the harbour they are likely to recover from any temporary disturbance within hours or days (Berrow, 2019).

According to the MMRA, the risk of injury or mortality to harbour seal is considered extremely low despite the possibility of exposure to dredging operations. Seals at Glengarriff are regularly exposed to small vessels and are aware of their presence. The dredging excavator will be situated on land or on a barge and only the bucket will enter the water. Therefore, the risk of injury or mortality is non-existent. The chance of releasing dredged material on top of a marine mammal is non-existent as the dredge material will be removed from the site (Berrow, 2019).

With regard to disruption of life cycle of marine mammals in the area, this is considered extremely low. At Glengarriff, the activity of a dredger could cause displacement of harbour seals from the immediate area. However, any effect would be temporary given the short time scale of the project (approximately 5-10 days). Any effect is likely to be localized and of short-duration. Seals are also able to avoid the area by hauling out away from the site vicinity.

Despite the relatively short time period and small scale associated with the proposed works, it is considered that based on the precautionary principle, wi*thout mitigation*, there is potential for disturbance/displacement effects to harbour seal as a result the proposal. Therefore, it is recommended that certain mitigation measures are implemented to ensure that any significant effects are avoided. These are outlined below in **Section 6** below.

5.2.2 Otter (*L. Lutra*)

The main threat to this species from the proposal is disturbance/displacement effects associated with fugitive noise emissions from dredging activity and human presence during the works. There is also, albeit, limited potential for indirect disturbance/displacement to otter should the proposal lead to a reduction in prey availability by means of adverse water quality impacts.

The otter survey carried out in the vicinity of the proposed area of works determined that otters are active around Glengarriff Pier and in the environs of Glengarriff Harbour (refer to **Appendix 2** for otter survey summary report).

With regards to potential disturbance/displacement of foraging or commuting otter due to fugitive noise emissions associated with the works such as from increased human activity, or any plant, vehicles or the barge vessel, if required, it is considered that any otters which may be present in the surrounding area are likely to comprise part of the resident local population given otter's territorial nature. Therefore, these individuals are likely habituated to some degree of disturbance given the level of otter foraging activity recorded in the vicinity of the pier, as evidenced during the field survey, and the level of existing recreational and commercial activities that take place at the pier on a daily basis. Were otters to occur in the vicinity of the pier at the time of the works, bearing in mind that the works will be restricted to normal working hours and will take place over a short duration of 1-2 weeks, it is considered that at most any disturbance/displacement impacts to otter will be temporary and will not be significant, with regards to either the resident otter population or vagrant individuals, were they to occur. Furthermore, existing levels of vessel activity are not expected to increase considerably following completion of dredging works and reinstatement of the pontoon. Therefore, significant disturbance/displacement impacts to otter from fugitive noise/human activity during any phase of the project are not expected to occur.

With regards to potential disturbance/displacement of otter or their breeding or resting sites it is noted that potential holts or other temporary resting sites were not identified within the proposal site or its immediate vicinity. Only one potential holt was identified during the survey. This was recorded on the shoreline at the eastern end of the study area near 'Bamboo Park', approximately 270m north-east of the pier on the opposite side of the harbour. Several potential temporary resting sites were identified within the area surrounding the pier, the closest of which were located approximately 50m north of the pier in an area of wooded shoreline. Given these findings, and bearing in mind the location, small scale and temporary nature of the works (1-2 weeks), significant disturbance/displacement of otter or their breeding or resting sites is not envisaged as a result of the proposal; however, based on the precautionary principle mitigation measures are recommended with regards to otter. These are outlined in **Section 6** below.

With regards to the potential for indirect disturbance/displacement effects due to impacts to water quality, which could potentially result in a reduction in prey availability, it has been concluded in **Section 5.1** above that significant water quality impacts are not expected as a result of the proposal. However, based on the precautionary principle, certain mitigation measures regarding protection of water quality are recommended and are included in **Section 6** below.

5.3 HABITAT LOSS AND ALTERATION

There is no spatial overlap or potential impact pathway between the proposed area of works and either of the two woodland habitats for which the Glengarriff Harbour and Woodland SAC is designated; therefore, these habitats have not been selected for assessment, as no potential for significant habitat impacts exists.

With regards to harbour seal and otter the proposed works at Glengarriff Pier will not result in any significant loss or alteration of habitat for either of these qualifying interest species. However, based on the precautionary principle, certain mitigation measures regarding protection of water quality are recommended and are included in **Section 6** below.

5.4 HABITAT OR SPECIES FRAGMENTATION

Habitat fragmentation has been defined as 'reduction and isolation of patches of natural environment' (Hall et al., 1997 cited in Franklin et al., 2002) usually due to an external disturbance such that an alteration of the spatial composition of a habitat occurs that alters the habitat and 'create[s] isolated or tenuously connected patches of the original habitat' (Wiens, 1989 cited in Franklin et al., 2002). This results in spatial separation of habitat units which had previously been in a state of greater continuity. Adverse effects of habitat fragmentation on species/populations can include increased isolation which can detrimentally impact on their resilience or robustness potentially altering species abundance and leading to a reduction in overall diversity.

As stated previously, the proposed works at Glengarriff will be relatively small in scale and be undertaken over a relatively short period of time (1-2 weeks). Given the nature and location of the works at Glengarriff Pier, significant habitat or species fragmentation is not envisaged as a result of the proposed dredging operations. It is therefore objectively concluded that significant habitat or species fragmentation impacts are not likely to occur within the Glengarriff Harbour and Woodland SAC (000090).

6 MITIGATION

With regards to the proposal, the following mitigation measures are recommended:

6.1 GENERAL WATER QUALITY PROTECTION MEASURES

- A suitably qualified ecologist, ideally familiar with the sensitivities of the site should brief the contractor prior to the commencement of the works..
- Ensure dredging is undertaken in a manner that reduces the volume of sediment that escapes into the water column and becomes suspended.
- Overflow of dredge material from either the excavator bucket or trucks should be avoided.
- Care should be taken to ensure a minimum amount of spillage from the excavator bucket while transporting spoil to trucks.
- It is recommended that appropriate fuel management measures are put in place. A fuel management plan should be prepared and implemented by the contractor prior to the commencement of works so as to minimise any potential risk to the environment as a result of fuel/oil spill.

6.2 MARINE MAMMALS

In-line with NPWS guidance and the MMRA for the proposed works, it is recommended that a suitably qualified and experienced marine mammal observer (MMO)[7] is present for the duration of the proposed works to implement NPWS Guidelines. This observer will determine the presence or absence of marine mammals in the area and will log all relevant events using standardised data forms (DAHG, 2014). The use "ramp up" procedures for noise and vibration emitting operations will also be implemented into the operation.

The NPWS recommend a distance of 500m radial distance of the dredging sound source in water depths of <200m (NPWS 2014) on commencement. The MMRA, prepared in support of this application, recommends a Mitigation Zone of 200m is sufficient given the limited sound exposure of even large-scale dredging operations (McKeown 2017 as cited in Berrow, 2019). If a significant negative change in behaviour is recorded such as rapid movement away from vessel or distress then the MMO should have the authority to cease operations until the exposed animal is clear of the site (Berrow, 2019).

As per the MMRA, the following mitigation measures are proposed to minimise the potential impacts on marine mammals, including harbour seal, and to allow animals move away from the dredging area:

1. All personnel will be appropriately trained about environmental issues prior to the start of the operation.
2. All equipment will be in good condition to avoid spillage or discharge of oil, smoke and excessive noise.
3. Refuelling will be carried out by competent and trained people away from any environmentally sensitive areas; and dredger to be moored up securely.
4. An appropriate waste container will be placed to collect waste before the final disposal by authorised company and hazardous material storage areas will be identified, labelled, and properly marked and fitted with spill containment systems;
5. Excavators and barges will be checked for any fuel/oil leaks on a regular basis by the crew.
6. Any spills we be reported immediately to the site agent/authorities
7. In the event of a major spill due to damage to the dredger. Locate and isolate, inform harbour authorities, Project manager and environmental agency.
8. A dedicated Marine Mammal Observer will conduct a 30 minute watch for marine mammals within 500m of the excavator prior to start up. If a seal or cetacean (or otter) is sighted within 100m of the excavator, start-up must be delayed until the animal is observed to move outside the mitigation zone or the 15 minutes has passed without the animal being sighted within the mitigation zone.
9. The excavator will be started at lowest revs of the pump, with pump revs increased over a 15 minute period to allow wildlife an opportunity to move further away from the vessel prior to the pumps reaching full power.

[7] In the context of this guidance a qualified marine mammal observer (MMO) is defined as a visual observer who has undergone formal marine mammal observation and distance estimation training (JNCC MMO training course or equivalent) and also has a minimum of 6 weeks full-time marine mammal survey experience at sea over a 3-year period in European waters.

6.3 OTTER

With regards to otter, the following mitigation measures are recommended, as per the guidance document '*Guidelines for Treatment of Otters Prior to the Construction of National Road Schemes*' (NRA, 2008):

- A pre-construction survey for otter should be carried out prior to the commencement of any works to search for signs of otter activity in the vicinity of the works, in particular any breeding and/or resting sites. Otter breeding may take place at any season of the year, so breeding activity at holts will need to be determined on a case by case basis.
- Where potential holts are identified, a period of monitoring over several days (e.g. five or more days of checking activity at the holt either with sticks or with sand pads to identify footprints) may be required to determine whether holts are active, inactive or disused. Otters do not tolerate disturbance at or near holts that are in active use.
- If a period of time has elapsed between the recommended pre-construction survey and commencement of the works, a further inspection of the development area, immediately prior to the works, should be carried out to ensure that no new holts have been created in the intervening period and to check if any of the previously identified holts are in active use by breeding females or have otter cubs present.

With regards to site works in the vicinity of active otter holts (where identified):

- No works should be undertaken within 150m of any holts at which breeding females or cubs are present. Following consultation with NPWS, works closer to such breeding holts may take place – provided appropriate mitigation measures are in place, e.g. screening and/or restricted working hours on site.
- No wheeled or tracked vehicles (of any kind) should be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance should also not take place within 15m of such holts, except under licence.
- The prohibited working area associated with otter holts should, where appropriate, be fenced with temporary fencing prior to any possibly invasive works. Appropriate awareness of the purpose of the enclosure should be conveyed through notification to site staff and sufficient signage should be placed on each exclusion fence. All contractors or operators on site should be made fully aware of the procedures pertaining to each affected holts.
- Where holts are present in close proximity to invasive construction works but are determined not to require destruction, construction works may commence once recommended alternative mitigation measures to address otters have been complied with.

6.4 ALIEN INVASIVE SPECIES - BIOSECURITY

There were no invasive species identified on site, however biosecurity measures should be implemented to reduce the likelihood of invasive species being introduced. Vehicles and tools will be cleaned before use. Work boots will be dipped in or scrubbed with a disinfectant solution and thoroughly dried afterwards before being used on the site for the first time (Also requirement during water quality sampling between different catchments). All PPE will be visually inspected and any attached vegetation or debris removed. PPE and tools will remain on site for the duration of

construction. Any machinery or equipment returning from a different construction site will cleaned, power washed/steam washed and visually inspected again before re-entering the site.

6.4.1 Methodologies

Invasive species management methodologies and plans outlining Best Available Techniques (BAT) will be sourced from the National Invasive Species Database, from previously published documents and from the Invasive Species Ireland and Inland Fisheries Ireland websites.

6.5 ASSESSMENT OF POTENTIALLY SIGNIFICANT IN-COMBINATION EFFECTS

Projects/activities that could act in-combination with the proposed works to cause in-combination effects on water quality and/or disturbance/displacement effects include the normal day-to-day operations at Glengarriff Pier, as well as other activities, as outlined in **Section 4.3.1** above.

In terms of the proposals potential to cause in-combination effects on water quality impacts as a result of interaction with activities in the area, it has been determined in **Section 5.1** above that significant water quality impacts are not predicted as a result of the proposal. Dredging activity will be minor in scale, will be temporary in nature and will be restricted to a limited dredge footprint of approximately 900m^2. Therefore, as significant water quality impacts from the proposal are not predicted, it is determined that there is no potential for significant in-combination effects on water quality as a result of interaction with existing activities in the area.

With regards to the potential for in-combination effects causing disturbance/displacement the proposal is not considered to have any potential for significant disturbance/displacement impacts to any of the qualifying interest species for which the Glengarriff Harbour and Woodland SAC is designated.

Bearing in mind the minor scale and temporary, localised nature of the proposal, no significant in-combination effects are envisaged, as a result of the programme of works described in **Section 4.3** above.

7 RESIDUAL IMPACTS

Provided that the recommended mitigation measures are implemented in full, it is not expected that significant residual impacts will remain on the species which are the target of this assessment. Thus, it is not expected that the proposal will have significant adverse impacts on the Natura 2000 site which is the focus of this assessment, namely:

- Glengarriff Harbour & Woodlands SAC (000090)

8 CONCLUSION

- The proposed project has the potential (*without mitigation measures*) to impact negatively on the Glengarriff Harbour & Woodlands SAC;
- The main potential impacts on this protected site are the risk of water quality effects, and/or disturbance/displacement of otter and harbour seal due to underwater noise emissions from dredging and to a lesser extent the increase in human activity associated with the works;

- Mitigation measures proposed include the employment of a marine mammal observer (MMO), the implementation of best practice guidelines in relation to managing the risk to marine mammals from man-made sources of underwater noise and protection of water quality including use of fuels/oils and minimising release of sediments to the aquatic environment during removal from site;

- Provided the proposed mitigation measures are fully and adequately implemented during the construction phase of the proposed development, no significant direct, indirect or in-combination effects on the integrity of the Natura 2000 site considered in this assessment are likely to occur.

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Appendix 1

Stages of Appropriate Assessment

Stage 1 - Screening

This is the first stage of the Appropriate Assessment process and that undertaken to determine the likelihood of significant impacts as a result of a proposed project or plan. It determines need for a full Appropriate Assessment.

If it can be concluded that no significant impacts to Natura 2000 sites are likely then the assessment can stop here. If not, it must proceed to Stage 2 for further more detailed assessment.

Stage 2 - Natura Impact Statement (NIS)

The second stage of the Appropriate Assessment process assesses the impact of the proposal (either alone or in combination with other projects or plans) on the integrity of the Natura 2000 site with respect to the conservation objectives of the site and its ecological structure and function. This is a much more detailed assessment that Stage 1. A Natura Impact Statement containing a professional scientific examination of the proposal is required and includes any mitigation measure to avoid, reduce or offset negative impacts.

If the outcome of Stage 2 is negative i.e. adverse impacts to the sites cannot be scientifically ruled out, despite mitigation, the plan or project should proceed to Stage 3 or be abandoned.

Stage 3 - Assessment of alternative solutions

A detailed assessment must be undertaken to determine whether alternative ways of achieving the objective of the project/plan exists.

Where no alternatives exist the project/plan must proceed to Stage 4.

Stage 4 - Assessment where no alternative solutions exist and where adverse impacts remain

The final stage is the main derogation process examining whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project to adversely affect a Natura 2000 site where no less damaging solution exists.

Appendix 2

Screening for Appropriate Assessment