

# **An Bord Pleanála Oral Hearing**

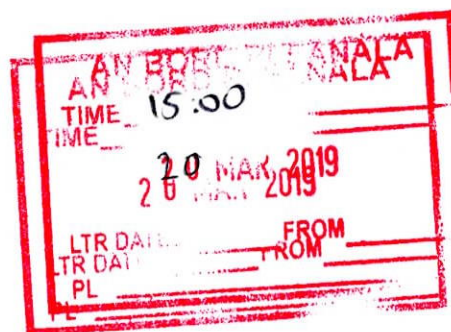
**Irish Water**

**Greater Dublin Drainage**

**Brief of Evidence**

**Biodiversity (Marine)**

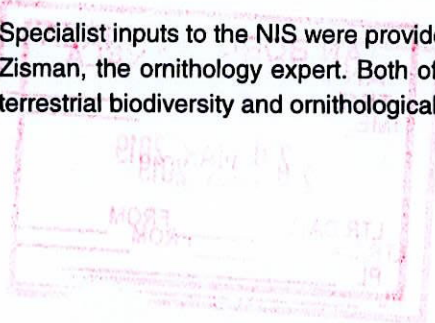
**Ian Wilson**



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Biodiversity (Marine)**

**Qualifications and Role on the Proposed Project**

- 1 My name is Ian Wilson and I am a Director and the principal scientist of Benthic Solutions Limited, an independent marine environmental consultancy. I have a combined Bachelor of Science degree in marine biology and oceanography from the University of Southampton and my work experience covers the fields of marine environmental chemistry, biology, oceanography, geology and shallow geophysics. I have been working in these technical disciplines for the past thirty years both in Ireland and internationally. This experience includes the assessment of seabed environmental conditions for numerous projects including outfall, pipeline and cable route selection surveys. My experience in marine surveys includes the acquisition of multi-disciplinary survey data and its interpretation, both as individual datasets or the collective relationships between multiple disciplines.
- 2 I was the founder member of Gardline Environmental Limited (the largest marine environmental survey company in Europe) and its principal scientist for 16 years. During this time, I pioneered many different survey and interpretation techniques now routinely used in habitat mapping and marine environmental assessments in offshore industries. I now provide consultancy support to many major environmental consultancies and have been responsible for the majority of technical specifications for offshore environmental studies carried out for the oil and gas industry around the British Isles over the past decade.
- 3 I have extensive experience in environmental surveys for proposed marine infrastructure projects and large field developments. These include outfalls, pipeline and cable route selection surveys for the oil and gas industry, renewables (e.g. offshore wind farms) and utility companies (i.e. electricity, gas, telecommunications and water), throughout the UK and worldwide. I have prepared marine biodiversity chapters for Environmental Impact Assessment Reports (EIARs) and Natura Impact Statements (NISs) for a range of projects, including many projects operating in environmentally sensitive areas such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Marine Conservation Areas.
- 4 I have been involved in the Proposed Project since 2011, and have advised Fingal County Council initially and subsequently Irish Water on marine ecological constraints, survey planning and data acquisition requirements since Phase One of the Proposed Project which considered alternative sites for the proposed Wastewater Treatment Plant (WwTP) throughout North County Dublin. My involvement culminated in the preparation of Chapter 9 Biodiversity (Marine) in Volume 3 Part A of the EIAR and the relevant marine ecology inputs into the NIS submitted to An Bord Pleanála in June 2018, and input on marine ecology issues in Irish Water's Response to An Bord Pleanála dated 11 January 2019 (the Response).
- 5 In preparing Chapter 9 in Volume 3 Part A of the EIAR, I was assisted by a team of field scientists from Benthic Solutions Limited who collected field survey information on the marine and benthic environment during multiple surveys between 2012 and 2017. Additional supporting studies were also carried out for marine related studies pertaining to underwater noise and water quality by Techworks Marine and an extensive marine mammal survey carried out by the Irish Whale and Dolphin Group. Fisheries surveys were also undertaken by Aquatic Services Unit (of the Environmental Research Institute of University College Cork) and RPS.
- 6 Specialist inputs to the NIS were provided from James McCrory, terrestrial biodiversity expert and Dr Simon Zisman, the ornithology expert. Both of those experts have also prepared a precis of evidence relating to terrestrial biodiversity and ornithological features assessed in the NIS.





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**Summary of Likely Significant Impacts and Mitigation Measures**

- 7 Chapter 9 in Volume 3 Part A of the EIAR is titled Biodiversity (Marine). As noted above, it combined information from a number of surveys undertaken by a variety of ecologists with expertise in particular fields.
- 8 Sections 9.1 and 9.2 of Chapter 9 comprise an introduction to the chapter, followed by the methodologies used for undertaking baseline biodiversity surveys and detail of the reports and publications referenced in the chapter. Sections 9.3 relates to the existing marine environment. This Section is further supported by a technical appendices A9.1 in Volume 3 Part B of the EIAR and a number of associated figures in Volume 5 Part A of the EIAR as follows:

**Volume 3, Part B of the EIAR**

- 9 Appendix A9.1 Marine Ecology Reports:

- Marine Ecology Supporting Information;
- Phase II Ireland's Eye Reef Survey;
- Baldoyle Estuary Baseline Habitat Survey;
- Whelk Survey Report; and
- Juvenile Fish Surveys 2015 and 2017

**Volume 5 Part A of the EIAR**

- Figure 9.1 Summary of Field Survey Operations for the proposed Outfall Pipeline Route;
  - Figure 9.2 Summary of Bathymetry Data for the Proposed Outfall Pipeline Route;
  - Figure 9.3 Sediment Changes near the Proposed Outfall Pipeline Route and Diffuser Location;
  - Figure 9.4 Casual Sightings and dedicated Surveys of the Harbour Porpoise;
  - Figure 9.5 Inshore Shellfish Grounds along the Fingal Coast; and
  - Figure 9.6 Maximum Suspended Sediment Plume Concentration arising from Dredging over the Duration of the Dredging Works for the Proposed Outfall Pipeline Route.
- 10 Sections 9.4 and 9.5 of Chapter 9 of the EIAR include descriptions and assessments of the potential likely significant effects of the Proposed Project on marine biodiversity resources during both the Construction and Operational Phases of the Proposed Project, respectively.
- 11 A section of the proposed outfall pipeline route (marine section) is to be:
- Located within Rockabill to Dalkey Island cSAC;
  - Located in proximity to Ireland's Eye SPA; and
  - Tunnelled below Baldoyle Bay SAC, SPA, Ramsar site and proposed Natural Heritage Area.

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- 12 Qualifying features of European Sites are located within the Zone of Influence of the Proposed Project, and as they relate to marine biodiversity and ornithology, they are assessed in Chapters 9 Biodiversity (Marine) and Chapter 10 Biodiversity (Marine Ornithology) in Volume 3 Part A of the EIAR and also in the NIS.
- 13 There are a number of potential effects upon the marine biodiversity resource that could occur during the Construction Phase which were assessed in the EIAR. These include:
- noise and or vibration impacts from the construction of proposed temporary construction compounds, micro tunnelling beneath the Baldoyle Estuary, dredging along the proposed outfall pipeline route (marine section) and the piling at interface locations and a cable crossing location;
  - pollution emissions from the construction of the proposed temporary construction compounds or marine dredging operations;
  - surface bentonite and/or air breakout within the Baldoyle Bay SAC during micro tunnelling;
  - suspended sediment plume during the dredging of the marine outfall route and impact on the qualifying features within the Rockabill to Dalkey Island SAC; and
  - disturbance and habitat loss during the dredging and subsequent installation of the proposed marine diffuser.
- 14 There are a number of potential effects upon the marine biodiversity resource that could occur during the Operational Phase which were assessed in the EIAR. These include:
- water quality within the vicinity of the proposed marine diffuser; and
  - permanent habitat loss to qualifying features within the Rockabill to Dalkey Island SAC.
- 15 Construction Phase effects are temporary, with the exception of a very localised permanent loss of marine habitats around the proposed marine diffuser location. This is of negligible significance to the Rockabill to Dalkey Island SAC. Operational Phase effects are predicted to be negligible to minor and potentially beneficial. There will be no significant impacts on the conservation objectives of the Rockabill to Dalkey Island SAC and therefore the Proposed Project will not adversely affect the integrity of the SAC.
- 16 Mitigation measures have been incorporated into the Proposed Project to offset potential significant adverse effects on marine biodiversity resources.
- 17 During construction, trenchless techniques will be used for the crossing below Baldoyle Bay SAC/SPA including the beach (at Velvet Strand) and the nearshore section of the land fall. Dredging and piling operations that create underwater noise will be closely monitored for the presence of marine mammals following guidelines to manage the risk to marine mammals from man-made sound sources in Irish waters (NPWS 2014). The plume created during the discharge of dredged material will be tidally controlled to reduce impacts to the qualifying features (subtidal reefs) found within the Rockabill to Dalkey Island SAC at Ireland's Eye. Additional real time turbidity monitoring will also be used to confirm this.
- 18 During all phases of the construction works an Ecological Clerk of Works will supervise or implement a number of mitigation measures specified in the Construction stage Environmental Management Plan (the CEMP), including:
- provision of toolbox talks to the contractor's operatives;



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- establishing ecological constraints and procedures during field construction operations including the requirement for surface intervention in the event of a surface breakout during micro tunnelling operations; and
  - establishing vessel-based mitigation procedures for noise and suspended sediment impacts. These include:
    - The use of marine mammal observations and passive acoustic monitoring during piling activities to ensure that animals are at a safe distance from the operations once activity starts. This is an effective technique used throughout western Europe for operations of this type.
    - Controlled discharge of dredge spoil during construction which will prevent excessive suspended sediments impacting reef features on Ireland Eye. This will be monitored during the operation via telemetered turbidity measurements close to the island.
- 19 There are no predicted significant long-term residual effects upon the marine biodiversity resource, following the implementation of mitigation measures. The potential for a minor residual impact is predicted for migratory fish and harbour porpoise based on a short-term duration during piling operations.
- 20 The project details and residual impact outlined in the EIAR were assessed in relation to the European Union's Marine Strategy Framework Directive (MSFD) (Directive 2008/56/EC), transposed into Irish Legislation under EC Regulation S.I. No.249 of 2011 with the aim to achieve or maintain a Good Environmental Status (GES). A summary of impacts to biodiversity, categorised against each qualitative descriptors, is provided for reference in Appendix 1.

**Responses to Issues Raised in Submissions/Observations**

**Response to General Issues in Submissions**

- 21 Ninety four (94 no.) submissions raised general issues about the potential for effects upon marine biodiversity features as a result of the Proposed Project, and these submissions are enumerated at Paragraph 423 in Section 10.2 of Irish Water's Response to An Bord Pleanála dated 11 January 2019. The general issues raised relate to effects upon local wildlife and their habitats, European sites and their qualifying interests. The following general themes were raised in the submissions:
- potential impact on cSACs and SPAs and associated protected species;
  - potential impact of malfunction and release of untreated wastewater on marine ecology;
  - potential impact on harbour porpoise;
  - potential impact on fish species; and
  - potential impact of tunnelling on marine ecology.
- 22 A summary of the responses relating to these areas is given in paragraphs 28 to 34, below.
- 23 Effects upon biodiversity features are assessed in three complementary biodiversity chapters of the EIAR; Chapter 9 (Marine), Chapter 10 (Marine Ornithology) and Chapter 11 (Terrestrial and Freshwater Aquatic). Effects on European sites and their qualifying interests are more specifically dealt with in the NIS.
- 24 As noted above, there are a number of potential effects upon marine biodiversity resources that could occur during the Construction and Operational Phases. With the exception of a very localised permanent loss of



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marine habitats around the proposed marine diffuser location, all Construction Phase effects are temporary. Evidence presented by Ciarán O'Keeffe on risk has confirmed that there is no marine discharge during an operational failure so there would be no potential impact from a malfunction.

- 25 A range of mitigation measures have been incorporated into the Proposed Project to offset potentially significant effects on marine biodiversity resources. These include a trenchless crossing technique across Baldoyle Estuary, detailed monitoring and management of marine mammal activity during periods of underwater construction noise and the management of suspended sediments close to Ireland's Eye Island though controlled spoil discharge during the dredging operation.
- 26 An Ecological Clerk of Works will be appointed by Irish Water to ensure effective implementation of biodiversity mitigation measures specified in the EIAR, NIS and the Outline Construction Environmental Management Plan, and to act as a liaison between Irish Water and the relevant Planning Authority in the discharge of planning conditions relating to biodiversity.
- 27 Once the above mitigation measures are implemented, there will be no significant residual effects upon marine biodiversity resources.

**Potential Impact to cSACs and SPAs**

- 28 The issue of potential impacts on ecology and designated areas, including cSACs and SPAs, are addressed in the ecology impact assessments provided in Chapter 9 Biodiversity (Marine), Chapter 10 Biodiversity (Marine Ornithology) and Chapter 11 Biodiversity (Terrestrial and Freshwater Aquatic) of the EIAR.
- 29 A NIS, which examines the likely significant effects of the Proposed Project on European Sites was also prepared and included as part of the planning application. A separate statement of evidence, prepared by James McCrory addresses the issues arising on the Appropriate Assessment to be conducted by the Board in detail. For present purposes, it is sufficient to note that the NIS concludes:

*"It is concluded, beyond reasonable scientific doubt, that the Proposed Project with the implementation of the prescribed mitigation measures will not give rise to significant impacts, either individually or in combination with other plans and projects, in a manner which adversely affects the integrity of any designated site within the Natura 2000 network."*

- 30 Chapter 9 Biodiversity (Marine) in Volume 3 Part A of the EIAR addresses potential impacts on marine ecology, including protected and sensitive species such as harbour porpoises. A negligible to minor residual impact is predicted for harbour porpoises once appropriate mitigation is in place to avoid impacts associated with elevated noise during dredging and piling activities. All are short -term. On this basis, the Proposed Project will not adversely affect the integrity of Rockabill to Dalkey Island candidate SAC, in view of the site's conservation objectives.

**Potential Impact of Malfunction and Release of Untreated Wastewater on Marine Ecology**

- 31 The evidence presented by Ciarán O'Keeffe relating to the likelihood of a significant malfunction at the processing plant outlines that the possibility of an uncontrolled release of untreated wastewater into the marine environment is a negligible possibility. Consequently, there would be no additional risk to the marine ecology from this scenario.
- 32 An additional assessment was modelled for an extreme event where the concentration of suspended sediment was increased for a 3 day discharge of 300mg/l. Results indicated that pumped wastewater would continue to show a rapid dilution on discharge and create only a very localised plume. There would be no significant impact to the marine ecology. Marine mammals are routinely recorded in areas of high suspended sediment, whilst the hydrodynamic model indicated that this small suspended sediments plume would quickly



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disperse and flow away from the diffuser in a seaward direction, away from designated reefs located on Ireland's Eye.

**Potential Impact to Fish Species**

- 33 The findings of the hydrodynamic model indicate that the nutrient enrichment levels anticipated, and the modelled rate of dispersion offshore, will have a negligible impact both locally and regionally upon fish and shellfish populations.

**Potential Impact of Tunnelling on Marine Ecology**

- 34 The use of micro tunnelling has been proposed to avoid direct impact on Baldoyle Bay and to preserve this environment within its current state. The use of this type of construction technology is well understood. The potential impacts in relation to disturbance from noise, pollution and construction activities are discussed in Chapter 9 Biodiversity (Marine) in Volume 3 Part A of the EIAR and will be of Negligible to Minor significance.

**Response to Specific Issues Raised by Prescribed Bodies**

***Development Applications Unit***

**Submission:**

- 35 The submission from the Development Applications Unit asserts that the '*proponent*' must ensure that the Operational Phase mitigation is in compliance with current NPWS guidelines for marine mammals in Irish Waters.

**Response:**

- 36 It is confirmed on behalf of Irish Water that operations will be carried out in compliance with "*Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*" (NPWS 2014) as addressed in Section 9.7.1 in Chapter 9 in Volume 3 Part A of the EIAR.

***Fingal County Council***

**Submission:**

- 37 The submission from Fingal County Council (which includes the Chief Executive's Report and Councillor comments) requested that the impact on Shellfish during the Operational Phase be clarified.

**Response:**

- 38 The impact to nearby water quality during the Operational Phase of the Proposed Project is under the brief of evidence for Water Quality (Alan Berry) and has already been addressed above with respect to water quality. For marine biodiversity, the low-level increase in coliforms within the surrounding waters does not have a direct impact on the ecological receptors within the area of influence (as dictated by the model) including the benthos and the shellfish. However, whilst these species may not be directly impacted by the operational plume, the movement of organic materials and coliforms may be maintained within the food chain for a short period of time. Marine life may carry low concentrations of coliforms within their digestive systems, but these are flushed quickly out of their system when foraging in open water or during upstream periods of tidal flow.



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**Response to Specific Issues Raised by Observers**

**Dredging and Sediment Impact on Reefs**

**Submission:**

- 39 The submission<sup>1</sup> raised issues regarding the existing impact of sediment on reefs along the coast of Ireland's Eye in the Rockabill to Dalkey Island cSAC and the further impact dredging will have to these reefs.

**Response:**

- 40 This has been assessed in Section 9.4.3 of Chapter 9 Biodiversity (Marine) in Volume 3 Part A and Figure 9.6 in Volume 5 Part A of the EIAR and Section 6.2.2.3 of the NIS and showed no impact predicted to either the littoral and sublittoral reef features recorded within the cSAC. Mitigation measures were presented in Section 9.7.1 of Chapter 9 Biodiversity (Marine) of the EIAR and Section 7.4 of the NIS. These included managed spoil discharge and real-time monitoring of turbidity close to the reef with further operational alterations in the event that unacceptably elevated levels were observed. A detailed assessment of the subtidal reefs carried out in 2015 identified that the biological diversity in the area had not been significantly impacted by naturally high siltation levels. Accordingly, there will be no adverse effect on the reefs along the coast of Ireland's Eye in the Rockabill to Dalkey Island cSAC as a result of dredging associated with the Proposed Project.

**Potential Impact of the Construction Phase and Operational Phase on Harbour Porpoise**

**Submission:**

- 41 Three submissions<sup>2</sup> suggested that the impacts of noise from dredging and tunnelling on harbour porpoise were not considered in the EIAR (Section 10.3.3 and 10.3.10 in Irish Water's Response to An Bord Pleanála (dated 11 January 2019) and perceived possibility that the discharge during operation will impact on the harbour porpoise (Section 10.3.2 in Irish Water's Response to An Bord Pleanála (dated 11 January 2019).

**Response:**

- 42 Firstly, it should be noted that the impacts of noise from dredging and tunnelling on harbour porpoise were considered (see, for example, sections 10.3.3 and 10.3.10 in Irish Water's Response to Submissions January 2019 document) and also that issues in relation to the discharge during operation impacting on the harbour porpoise were also considered (section 10.3.2 in Irish Water's Response to An Bord Pleanála (dated 11 January 2019).
- 43 Secondly, the prevalence of harbour porpoises, along with other marine mammals were assessed following an extensive monitoring survey between 2015 and 2017 using both acoustic and observational techniques in the vicinity of the proposed development as outlined in detail in Section 9.3.7 in Chapter 9 of the EIAR. Results showed some of the highest densities recorded in Ireland and moderate levels of activity throughout the year with numbers reduced during late spring/early summer, possibly due to animals migrating more offshore prior to calving, before increasing again in late summer.
- 44 There will be no impacts from dredging operations outside the cSAC, however, out of an abundance of caution, mitigation measures using passive acoustic monitoring and marine mammal observations are proposed to limit proximity of animals during high noise construction operations (i.e. piling). Further restriction

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<sup>1</sup> Councillor David Healy

<sup>2</sup> Velvet Strand Sea Swimmers and Beach Users, Sabrina Joyce Kemper, Peadar Farrell



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of high noise operations to outside peak population periods will also reduce any potential minor impact within the cSAC itself.

***Construction***

- 45 The impact and spread of a dredging plume is discussed in Section 9.4 in Chapter 9 in Volume 3 Part A of the EIAR. The spread of the sediment plume remains relatively limited to approximately 500m to 600m either side of the dredging operation with concentrations recorded below 100mg/l. The size of this plume within the cSAC is negligible compared to the total area of the cSAC, with the harbour porpoise expected to show a simple avoidance reaction if a plume is encountered. As an inshore species, the harbour porpoise is regularly encountered in areas of high turbidity throughout the British Isles and will be unaffected by this material.
- 46 The impacts of construction on the harbour porpoise from noise associated with tunnelling, piling and dredging are detailed in Section 9.4 in Chapter 9 in Volume 3 Part A of the EIAR. Examples and literature datasets showed that the impact on harbour porpoises from tunnelling and dredging will be negligible, based on the noise levels expected during construction. A particularly noisy operation is expected through piling at the tunnel interface and cable crossings (both locations are outside the Rockabill to Dalkey Island cSAC) and, in any event, were additionally assessed for a transient porpoise population. Here, impacts are negligible from noise and vibration, once mitigation measures are effectively implemented with only a minor residual impact from a localised and short-term foraging displacement expected during the dredging works. The mitigation proposed will ensure that no injury or adverse impact will occur to the harbour porpoise during these two brief construction periods as outlined in Section 9.7.1 in Chapter 9 in Volume 3 Part A of the EIAR and following NPWS Guidelines (2014).

***Operation***

- 47 Section 9.5 in Chapter 9 in Volume 3 Part A of the EIAR describes the impact of the plume to the surrounding waters during the Operational Phase, while the dilution rates and area of plotted plume dispersion are discussed in detail in Chapter 8 Marine Water Quality in Volume 3 Part A of the EIAR. These sections concluded that significant dispersion rates are expected in the near field mixing zone and the water quality is expected to maintain an 'excellent' water quality status set out for 'coastal' waters and as set out in the WFD for 'Surface Waters. This would prevent impacts to local bathing water quality and impacts to other protected areas nearby (such as shellfish waters).
- 48 A model of the discharge during the operational period of the outfall describes a high water-quality standard that will be maintained during the discharge along with the expected performance of the discharge into the receiving waters at all states of the tide. The multiport diffuser is located in a moderate water depth of approximately 23m. The model indicated a high natural dispersion rate and a low physical plume impact throughout the year. Simulations over the full tidal cycle for both neap and spring tidal scenarios, indicating consistently high dilution rates and a dominant migration of the discharge out to sea.
- 49 Assessing the impact of water quality on the marine mammals, Section 9.5 in Chapter 9 in Volume 3 Part A of the EIAR describes a negligible but positive impact over a long-term duration (i.e. the lifetime of the proposed outfall). This is due to the possible enhancement of fish life around the proposed marine diffuser location (attracted by the seabed structure and/or possible increased productivity). This may result in a negligible beneficial impact for pinnipeds, but a minor beneficial impact to harbour porpoises. However, as the area of the plume represents only a very small proportion of foraging range, the overall significance of impact is expected to be negligible for both species.
- 50 Whilst the plume from the effluent discharge is located within the cSAC, the final concentration of suspended sediments predicted during the operational phase will be below that detectable by this Annex II species and



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there will be no impact to this qualifying interest. On this basis, the qualifying interest of Annex II species found in Rockabill to Dalkey Island cSAC will not be compromised, and there will be no adverse effect on the integrity of the site.

**Impact of Micro tunnelling under Baldoyle Bay and Impact to the Saltmarsh**

**Submission:**

- 51 Three submissions<sup>3</sup> raised issues that tunnelling will impact on the wildlife at Baldoyle Bay and that the removal of materials offsite has not been considered.

**Response:**

- 52 Chapter 4 Description of the Proposed Project in Volume 2 Part A of the EIAR provides details regarding the construction of the proposed temporary construction compounds for tunnelling and activities associated with micro tunnelling. All such activities have been considered in Chapter 9 Biodiversity (Marine) in Volume 3 Part A of the EIAR. All materials generated during the tunnelling will be removed off site to an authorised facility and therefore will not impact on this European site.
- 53 The sensitivity of Baldoyle Bay SPA and cSAC has been described in Section 9.3.6 in Chapter 9 in Volume 3 Part A of the EIAR. The construction method for the proposed outfall pipeline route (marine section) has been designed to avoid any direct impact to the cSAC and to preserve this environment within its current state by constructing the outfall under the estuary using a micro tunnelling technique. The use of this type of construction technology is well understood with no potential impacts through noise, pollution and construction activities predicted in relation to disturbance on sensitive and qualifying species within the cSAC.
- 54 The hydrodynamic plume similarly shows that the discharged plume will not affect the Baldoyle Bay cSAC during the Operational Phase. Consequently, neither the qualifying features or the integrity of the cSAC will be compromised by the Proposed Project.

**Impact of Bentonite Leak**

**Submission:**

- 55 One submission<sup>4</sup> stated that a bentonite leak has the potential to impact on estuarine habitats.

**Response:**

- 56 The use of bentonite is tightly controlled during micro tunnelling processes minimising the magnitude of a release should it occur. Section 9.4.2. in Chapter 9 in Volume 3 Part A of the EIAR and Section 6.2.1 of the NIS both addressed the potential for a bentonite breakout during micro tunnelling beneath the Baldoyle cSAC. This concluded that, whilst the risk of a breakout cannot be negated completely, the nature and scale of possible contamination to the site from a surface bentonite release was deemed to be rare, minor and very short-lived. Bentonite drilling fluid is naturally occurring and non-toxic to marine fauna, although it can occasionally cause smothering impacts if discharged in large quantities. A release of bentonite may marginally increase the levels of some chemical components such as metals on surface sediments in the vicinity of the discharge and introduce a small quantity of suspended clay into the watercourse producing a localised plume effect. Both the EIAR and NIS described the different habitats and dominant marine species that could be affected by an accidental release of bentonite with the risk-profile changing relative to the position of the release on the foreshore. Areas of release that would not be liable to high natural dispersion,

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<sup>3</sup> Peadar Farrell, Velvet Strand Sea Swimmers and Beach Users, Portmarnock Beach Committee

<sup>4</sup> Sabrina Joyce Kemper



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such as high up on the shoreline, may require further management to reduce its impacts profile. This could include a measured recovery or enhancing dispersion where safe to do so. All of these impacts would be short term and would cover a very limited area resulting in a *de minimis* effect on the qualifying interests of Baldoyle Bay cSAC and would not adversely affect the integrity of the cSAC.

**Impact of the Proposed Project on Shellfish Waters**

**Submission:**

- 57 Two submissions<sup>5</sup> raised issues regarding the impact of the Proposed Project on designated shellfish waters (Section 10.3.5 of Irish Water's Response to An Bord Pleanála (dated 11 January 2019)).

**Response:**

- 58 The proposed outfall pipeline route (marine section) is located outside the Designated Shellfish Waters for Malahide although the route passes through other areas recognised as active for shellfish fishery production. The impact from the construction of the proposed outfall pipeline route (marine section) will be limited to a physical disturbance to the surface sediments and a localised impact along the pipeline itself as presented in Section 9.3.4 in Chapter 9 in Volume 3 Part A of the EIAR. Localised disturbance to the marine benthos and the sand-dwelling shellfish (such as the razor clam) is expected to be high from sediment removal or smothering of stored or plume-dispersed material but limited to a relatively small area of the trenched route (approximately 0.16km<sup>2</sup>), and neighbouring sediments (approximately 1km<sup>2</sup>). The benthos along the proposed outfall pipeline route (marine section) is based predominantly on sands, particularly in the western inshore section of the proposed route where the water depth is very shallow and subject to continuous reworking by wave induced currents. The central part of the proposed outfall pipeline route (marine section) is a silty sand, becoming increasingly coarser towards a muddy sandy gravel near the proposed marine diffuser location. There is an absence of any developed biogenic or geogenic features with any significant epifaunal component. The physical recovery of the surface sediments along the proposed outfall pipeline route (marine section) following construction is therefore expected to be rapid with a re-colonisation by the benthos in the dredged footprint localised areas occurring within six months for the majority of species, and one to two years for larger, slower-growing taxa.
- 59 The impact on water quality during the Operational Phase of the Proposed Project is covered under a separate brief of evidence. Section 9.5 in Chapter 9 in Volume 3 Part A of the EIAR summarises the expected high dispersion and significant near-field mixing zone of treated wastewater on discharge. The model confirms that an 'excellent' water quality status set out for 'coastal' waters will be maintained and will prevent impact to nearby bathing and shellfish waters. The modelled data for the discharge indicates that the impact plume has a limited spatial impact and will disperse significantly into the prevailing oceanography at the site. This fact, coupled with the discharge parameters will ensure there will be no ecological impact to shellfish waters.

**Impact of Dredging on Beaches and Sediment Patterns, or Sea Bass**

**Submission:**

- 60 This submission<sup>6</sup> raised issues on the impact of dredging during the Construction Phase on sediment patterns at Velvet Strand whilst another raised a concern that waste and suspended solids could endanger sea bass in an area used by local anglers at the end of Velvet Strand at the entrance to Baldoyle Bay.

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<sup>5</sup> Charles Heasman; Velvet Strand Sea Swimmers and Beach Users

<sup>6</sup> Portmarnock Beach Committee



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**Response:**

- 61 Section 9.4.3 in Chapter 9 in Volume 3 Part A of the EIAR demonstrated how the proposed outfall pipeline route (marine section) will be installed using a tunnel beneath Baldoyle Bay and Velvet Strand out to 600m from the coast. Figure 9.6 in Volume 5 Part A of the EIAR showed the resulting extent of the plume from the dredged section of the proposed outfall pipeline route (marine section) during construction with the results showing that these plumes will be short-term and have a negligible impact significance on Velvet Strand or on nearby fish species. The impact at the entrance to Baldoyle Estuary is predicted to be imperceptible. Hydrodynamic modelling and simulations of the predicted operational plume discharged into the receiving waters indicated consistently high dilution rates and a dominant migration of the discharge out to sea. Consequently, the impact to inshore waters within close vicinity of Velvet Sand or at the mouth of the Baldoyle Estuary is predicted to be imperceptible and Negligible.

**Disturbance to Wildlife via Impacts on Food Sources**

**Submission:**

- 62 One submission<sup>7</sup> raised issues that the NIS or EIAR did not assess the impact of the Proposed Project on food sources, in particular sand eels, for protected bird and wildlife species.

**Response:**

- 63 The importance of fish and shellfish species is discussed in Section 9.3.8 in Chapter 9 in Volume 3 Part A of the EIAR and this report confirmed that whilst sand eels and juvenile fish species were ecologically and commercially important species in shallow waters and they are likely to be recorded within the shallower sandy section of the proposed outfall pipeline route (marine section). Data from multiple marine surveys, however, indicated a generally low but inconsistent population in the vicinity of the proposed outfall pipeline route (marine section). Sand eels were assessed in the report as constituting a low but important food source for avian and mammal predators. As with other inshore fish species, an impact to the sand eel population during dredging would be temporary displacement away from the worksite. This is not expected to have a significant impact to predators as the impact area from the predicted plume has been assessed to cover a relatively limited area compared to the foraging range of most predators and these groups would simply follow any displacement, should it occur. The impact from dredging will be short term with the overall impact assessed as of negligible significance. The discharge during the Operational Phase of the Proposed Project will not impact on sand eels.

**Eutrophication Impacts on the Estuarine System**

**Submission:**

- 64 One submission<sup>8</sup> raised issues that the impact of the outfall discharge is not examined for Baldoyle Bay candidate Special Area of Conservation.

**Response:**

- 65 Hydrodynamic modelling and simulations of the predicted operational plume discharged into the receiving waters indicated consistently high dilution rates and a dominant migration of the discharge out to sea. Therefore, the impact to inshore waters at Baldoyle Bay cSAC were predicted to be imperceptible, and therefore, negligible.

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<sup>7</sup> Sabrina Joyce Kemper

<sup>8</sup> Sabrina Joyce Kemper



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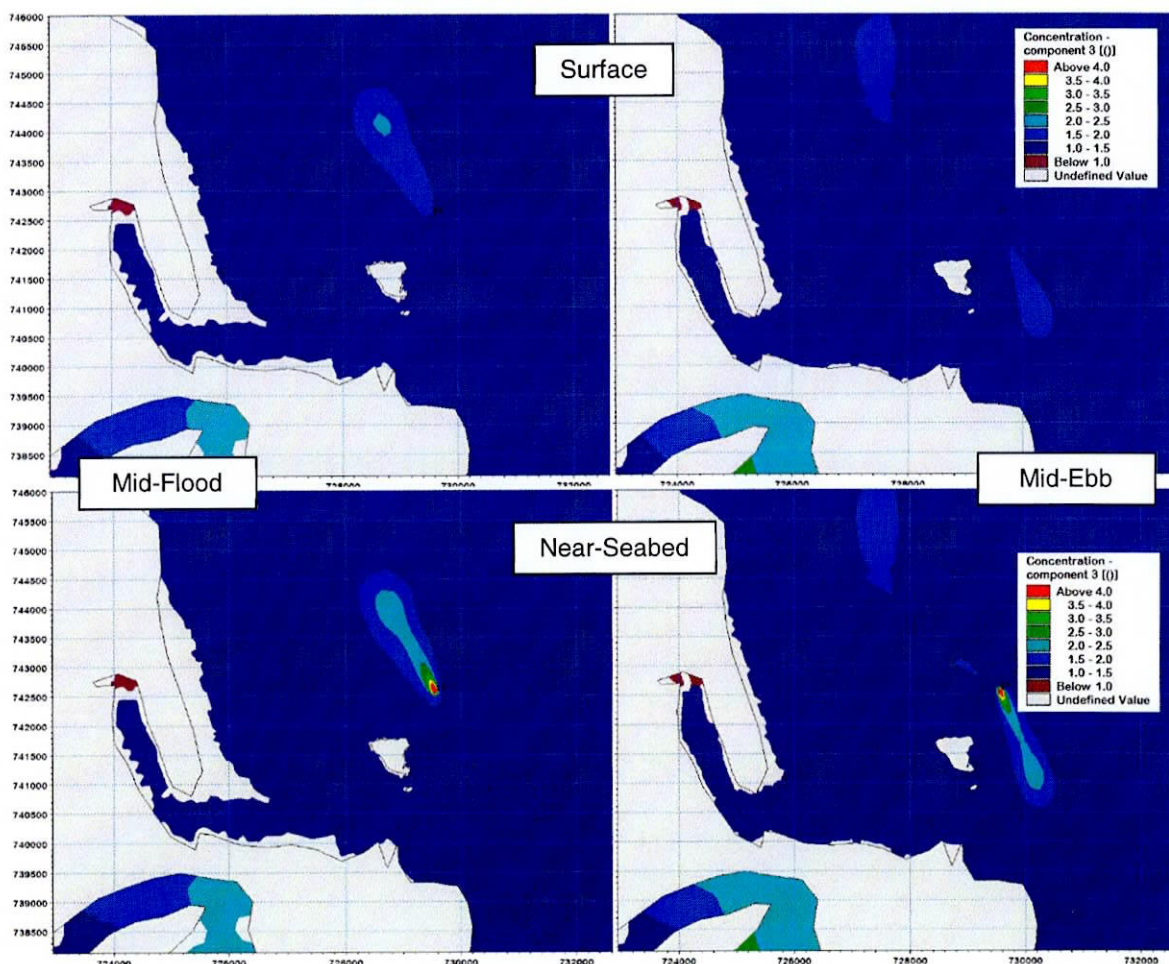
**Operational Phase Discharges following Malfunction**

**Submission:**

- 66 One submission raised an issue regarding the impact of discharges on the reefs and harbour porpoises at Ireland's Eye as a result of a malfunction during operation.

**Response:**

- 67 As previously noted above, evidence presented by Ciarán O'Keeffe, has confirmed that there is no marine discharge during an operational failure so there would be no potential impact from a malfunction.
- 68 A hypothetical assessment modelled for an extreme event where the concentration of suspended sediment was increased for a 3 day discharge of 300mg/l indicated that pumped wastewater would continue to show a rapid dilution on discharge and create only a very localised plume (Figure 1). This indicated no significant impact to the marine ecology.



**Figure 1. Discharged suspended solids concentrations at 300mg/l on the 3<sup>rd</sup> day of a process failure scenario.**



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**Conclusion**

- 69 In relation to third party submissions and observations, 94 submissions raised general issues about the potential for effects upon marine biodiversity features as a result of the Proposed Project.
- 70 Irish Water's response to these general issues may be summarised as follows:
- Sections 9.4 and 9.8 of the EIAR predict the significant construction phase effects of the Proposed Project on the marine wildlife, habitats and surface waters.
  - Sections 9.5 and 9.8 of the EIAR predict the significant operational phase effects of the Proposed Project on the marine wildlife, habitats and surface waters.
- 71 A number of submissions are more specific. Some of these have been grouped when relating to similar themes or issues. In each case, for the reasons set out above, it is submitted that the material presented in the EIAR adequately addresses the queries raised.
- 72 In relation to ecological assessment of biodiversity features in the area surrounding Ireland's Eye and at Portmarnock Beach, a significant portion of the evaluation and analysis presented in the ecological impact assessment in Chapters 9, 10 and 11 in Volume 3 Part A of the EIAR and the NIS is directed precisely at these locations due to their status as European sites.
- 73 Prescribed body submissions and observations have focused on net issues raised, and Irish Water's Response to An Bord Pleanála (dated 11 January 2019) address all the points raised and provides an adequate response.
- 74 Potential impacts to Baldoyle Bay cSAC have been avoided through the use of micro tunnelling of the proposed outfall pipeline route (marine section) across the estuary. Whilst the risk of a surface impact through bentonite or air breakout cannot be fully eliminated, the chance of this occurring is extremely remote, with a likely resulting impact considered as negligible significance. There will be no adverse effects on the integrity of the Baldoyle Bay cSAC.
- 75 Two key areas of mitigation are included during construction in order to reduce the significance of any impacts on qualifying interests within the Rockabill to Dalkey Island SAC to a negligible or minor level. These are as follows:
- The sublittoral reef on the north coast of Ireland's Eye will not be impacted by settlement of suspended sediment during dredging operations due to a controlled spoil discharge. Irish Water will only release material to the seafloor during flooding tides. This will dramatically reduce the concentration of suspended sediments to the south of the proposed outfall pipeline route (marine section) and surrounding this qualifying habitat, listed within the Rockabill to Dalkey Island SAC.
  - A telemetered turbidity meter will also be used to monitor the suspended sediment levels at this point during dredging operations.
- 75.1 The presence of harbour porpoises (and other marine mammals) has been extensively surveyed as part of the EIAR. Noise related impacts relating to dredging and other construction activities will be minimised following detailed mitigation procedures compliant with "Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters" (NPWS 2014). As result, impacts will be negligible or of short-term minor significance to this qualifying species during the Construction Phase and negligible impact during the Operational Phase. There will be no significant impacts on the conservation objectives of the Rockabill to Dalkey Island SAC and therefore the Proposed Project will not adversely affect the integrity of the SAC.



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- 76 Table 9.27 of Section 9.8 of the EIAR summarises significance of any residual impacts in relation to the marine biodiversity appraisal. Only short-term minor residual impacts are listed as a result of negligible behavioural impacts on transient migratory fish (Annex II) or harbour porpoises (cSAC qualifying species) during potential piling operations. However, there will be no adverse effects on the integrity of any European site. No significant residual impacts on the marine biodiversity features are predicted.

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### **Appendix 1 Marine Strategy Framework Directive**

The European Union's Marine Strategy Framework Directive (MSFD) (Directive 2008/56/EC), came into force in 2008 and aims to achieve Good Environmental Status (GES) of the marine environment across Europe by 2020. Each Member State is required to develop and implement a marine strategy and ensure it is kept up to-date and reviewed every six years. The marine strategy should comprise the following (on a six-yearly basis):

- an initial assessment of the current environmental status of its marine waters and the environmental impact and socio-economic analysis of human activities in these waters;
- determination of what GES means for those waters;
- targets and indicators designed to show whether GES is being achieved;
- a monitoring programme to measure progress towards GES; and
- a programme of measures designed to achieve or maintain GES.

The determination of GES is guided by 11 qualitative descriptors set out in Annex I of the Directive (Table 1), and further complemented by the Commission Decision on criteria and methodological standards for GES [COM 2010]477[EU] which set out criteria and indicators relating to the 11 descriptors. The latter was repealed and replaced with a revised Commission Decision on 17 May 2017 [COM 2017]848] which sets out primary and secondary criteria.

The MSFD was transposed into Irish Legislation by the EC (Marine Strategy Framework) Regulations S.I. No.249 of 2011. The regulations assign the Department of Environment, Community and Local Government (DECLG) as the responsible party for implementing the MSFD, whom are supported by the Marine Institute, as well as other organisations with responsibilities for the marine environment.

Ireland has published the required elements of its Marine Strategy (aligning with the bullet list above), although some of the thresholds for descriptors are not finalised (Ireland's Marine Strategy Framework Directive Article 19 Report, 2013). The initial assessment of GES published by Ireland reviews each of the descriptors and outlines the pressures and environmental impacts associated with them.

**Table 1: Overview for the GDDP of Qualitative Descriptors as set out in Annex I of the MSFD [COM 2008]56[EC]**

Descriptor No.	Definition	Impact during Construction	Impact during Operation
D1	Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.	Impacts to biodiversity will be a short-term displacement of mobile species through avoidance and a short-term, but localised, impact to sessile species on the seabed. No habitats are lost.	No impact predicted to either mobile or sessile fauna within the sphere of influence. Potential for minor increase in productivity during summer months.
D3	Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.	Negligible short-term displacement of shellfish fishery over limited area of seabed.	No impact predicted to either mobile or sessile shellfish within the sphere of influence.
D4	All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of	Active predators, such as fish, seals and porpoises may show a temporary displacement due to noise and suspended sediments, but over a very limited range and time period.	No impact to biodiversity over the year, but a minor localised increase in nutrient levels may increase productivity during summer months. This has the potential for negligible increase in feeding in the area my



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Descriptor No.	Definition	Impact during Construction	Impact during Operation
	the species and the retention of the full reproductive capacity.	Impact predicted as negligible to minor subject to species designation.	predatory species at these times (avian, fish, seals and porpoises)
D5	Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters.	Not applicable	Site selected for hydrodynamic qualities for high natural dispersion. Modelled data indicates no eutrophication from this project.
D6	Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.	Seabed structure and sediment type will be reinstated following construction. Only permanent impact is from hard surface found on diffuser. No impact predicted.	No impact predicted to sea floor. Suspended sediment output modelled to disperse away from the site.
D7	Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems.	No permanent alterations predicted.	No permanent alterations predicted.
D8	Concentrations of contaminants are at levels not giving rise to pollution effects.	Dredged sediments assessed for historical contamination with none identified. Pollution component limited to suspended sediment plume. Modelled to have no impact to biodiversity through controlled discharge.	No significant impact on nutrient levels in the receiving waters from the operation of the proposed outfall pipeline.
D9	Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards.	No contamination predicted to fish or shellfish during construction.	Malahide Shellfish fishery currently classified as Class A under S.I. No. 268/2006 – European Communities (Quality of Shellfish Waters) Regulations 2006. Modelling undertaken and level of treatment commitments made by Irish Water indicates no impact on this classification.
D10	Properties and quantities of marine litter do not cause harm to the coastal and marine environment.	Detailed CEMP to ensure no impact.	Discharge secondary treated to remove all litter. No impact predicted.
D11	Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment.	Noise through dredging and piling predicted to have localised short-term impact on mobilise species creating a temporary avoidance behaviour. Mitigation provided to prevent damage to marine mammals during high piling operations.	No noise related impacts are predicted.