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REF: ABP-312131-21 Greater Dublin Drainage Project (GDDP)

Summary:

I was commissioned to provide independent review of all original EIAR/NIS (2018) documents, 2022 and 2024 observer submissions, addendum (2023) documents (including appendices) and Uisce Éireann's (the 'applicant' herein) responses to submissions (2022 and 2024) submitted to An Bord Pleanála in support of their application for planning permission for the Greater Dublin Drainage Project (GDDP herein).

GDDP is a substantial project and has rightly received scrutiny from the wide range of stakeholders ('observer') including the general public, Government bodies and agencies, NGOs, and industry. To iterate, my review is independent and recognise An Bord Pleanála's commitment to ensure that this planning applications receives (i) a rigorous and robust review, and (ii) that the concerns of stakeholders are fully addressed prior to any decision on consent being made including drawing on expert independent scientific commentary.

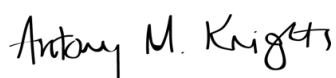
The most recent submission follows a decision by the High Court to rescind the initial planning consent and requirement for an addendum assessment of risk to the environment by the proposed development. This has led to the submission of EIAR Addendum Volumes 3, 4, 5 and 6 and Revised Natura Impact Statement (NIS).

I was commissioned to:

- 1). Report on the adequacy of the applicant's response to marine-related issues made in both the 2022 and 2024 observer submissions and include request(s) for additional information or clarification where necessary (Sections 1 and 2);
- 2). Report on the adequacy of the proposed UV treatment as it relates to impact on the marine environment, identification of additional information where necessary (Section 3); and
- 3). Provide an assessment, in report format, based on the information presented by the applicant, scientific evidence and professional judgement as to adequacy of the revised NIS, focusing on (i) marine related sites and (ii) the North-West Irish Sea cSPA (Section 4).

Below I provide the reports as requested.

Kind regards,



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1. Report on the adequacy of the applicant's response to marine-related issues raised in the submissions identified, to include request for additional information or clarification where necessary.

- 1.1. I was provided with relevant observations and applicant responses from 2022 and 2024 in relation to the application for independent review. Observations underwent an initial categorisation by the Inspector based on relevance to an appropriate expert (i.e. Ecologist, Environmental Scientist and Marine Ecologist) although all observations were available for comment if I deemed them appropriate to me in terms of my expertise. Observations were submitted to ABP by external stakeholders in response to published Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) submitted in support of the application, and responses to those observations (the 'Response to Submissions') were compiled by Jacobs Engineering on behalf of the applicant.
- 1.2. Sixteen submissions were received in 2022 and 23 in 2024. I reviewed a total of 36 (~19%) and 9 (10%) issues in the 2022 and 2024 documentation, respectively that were 'marine' related. Responses to submissions are provided in full in the "Response to Submissions" report. My view of the responses of the applicant to all relevant comments are described in full here. Responses are made in sequential order first beginning with the 2024 issues raised.
- 1.3. Below, a summary of each issue is provided (labelled 'Observer') alongside the response to the submission by the applicant ('Applicant'), followed by my own review ('Review'). Where applicable, I refer to relevant sections and page of the Response to Submission document.
- 1.4. It is my view that the applicant's responses to the 2022 submissions alongside the additional work undertaken in preparation for the 'new' 2024 submission and the revised 2023 EIAR/NIS have addressed the issues I identified in my assessment of the response to submissions with respect to the 2018/2022 texts. Therefore, I consider the 2022 submission issues resolved and herein I am assessing the 2024 submission and associated observer comments as the basis for this assessment.

2. Review of the Response to Submissions

- 2.1. **Observer:** Data gaps in application: The Doldrum Bay discharge was never modelled; modelling is flawed and cannot be relied upon. Interek 2023 , MarCon 2013 modelling reports were not submitted but is replied upon. Requests clarity on MarCon (2015) report. MarCon (2011) attached as App 3.1. Modelling was not modelled on actual discharge point but on a point further out to sea. Fails to meet requirement for precise and definitive scientific information required by the Habitats Directive. The Interek 2023 report is not submitted at all for the Board or observers to review.

Applicant: 3.2.1.2.4.4 (see 3.2.1.2.10) The observation in respect of Doldrum Bay has been answered in detail at Section 2.2.1.2.20. Also, (3.2.1.2.8) the Doldrum Bay outfall would no longer be operational at the time that the Proposed Project becomes operational, it was not included in the baseline modelling, it is still expected that the Doldrum Bay outfall will be decommissioned before the Proposed Project is operational. Also, (3.2.1.2.10) the 2011 and 2013 Marcon report informed alternative site location and outfall location refinement. Detailed modelling subsequently undertaken, appendix A8.1. The Interek 2024 report is not related to the project.

Review: The response of the applicant is reasonable and comprehensively describes the approach and process undertaken for assessing the potential impact of placement of the marine outfall with a view to identify locations of 'lowest impact'. The identification of potential outfall locations is justified and supported by appropriate scientific evidence.

The spatial scale of the model and the modelling approach used is robust and comprehensive using state-of-art tools. The assessment team has used appropriate auxiliary equipment (i.e. Acoustic Doppler Current Profilers; ADCP) to validate the model, with ADCPs placed in appropriate areas to capture ocean dynamics.

Results reveals the model is good at predicting the flow dynamics of the region, although does show some underestimation of current velocities in some cases. In this case, this would likely result in underestimates of dispersion; predictions of dispersion of material originating from the outfall are

therefore also likely to be underestimated such that any predictions of concentrations are conservative (i.e. at their highest levels). In reality, one might expect greater dispersion/ dilution of effects over space and time.

- 2.2. **Observer:** Data gaps in application: Dispersion of accumulated historical pollutants in the sediment not discussed - dredging at interface is 10-12m (only bored to 5m).

Applicant: Referring to Section 3.2.1.2.10.4 (pg 95), the applicant points toward the 2018 EIAR documentation where historical pollutants are discussed (see also 2.2.1.2.52.1 re boring).

Review: It is my view that the applicant has made a satisfactory and robust response to the query with respect to the potential for historical pollutants. Strong emphasis should be placed on the point that bore samples revealed "no evidence of contamination is made clear in their response, and that despite the absence of contamination, the impact assessment was classified as "moderate/slight", indicating the applicant has adopted the precautionary principle in their assessment and held themselves to a more conservative standard.

The applicant has made clear the trench dimensions, but it would be valuable to reiterate the dimensions of the proposed trench, restating that the "deep trench" is only 5m deep (see p. 13 of the revised NIS).

- 2.3. **Observer:** Data gaps in application: Re DIN: real risk development will cause HA 09 Irish Sea water body to drop by a class; development should not be granted. Re MPN/BOD - asks applicant to expand on what 'undefined' means and how it is a breach of the limit. Applicant failed to carry out assessment of EQS against Annex I of the Directive is a lacunae. Calls for updated model under the combined approach.

Applicant: (3.2.1.2.10.5) the planning application identified the concentrations of DIN parameters from rivers and outfalls that were used in the modelling studies; updated for 2023 application. (3.2.1.3.10.6) 'undefined area' does not denote a breach of the EQS limit but refers to identified exposed intertidal areas ...it is denoted as 'undefined' as it is an area that dries out and therefore model calculations are not undertaken for the water quality parameters at those locations at those times. (3.2.1.2.10.7) full account of all relevant statutory and non-statutory requirements has been taken. Modelling carried out demonstrates the receiving water will meet the requirements of the European Union Environmental Quality Objectives Regs.

Review: The applicant's response here is satisfactory with respect to definitions. Referring to the observer's comment on potential for "drop in class", diagrams 8.1- 8.16 show DIN concentrations in very localised areas exceed Good Status concentrations for Transitional Waters (Good Status limit is ≤ 2.6 mg/L) but not in the Malahide Shellfish Area. Elsewhere, waters are expected to meet Good or High status concentration levels. Coastal waters in area HA 09 (Irish Sea-Dublin) have been classed as Good ($[DIN] \leq 0.25$ mg/L) and Transitional waters as 'moderate' ($[DIN] > 2.6$ mg/L). The combined modelling undertaken, which includes other sources, **indicates no change in water body classification based on DIN concentrations** is predicted.

For the sake of clarity, it is recommended that a different word than 'undefined' is used to better reflect meaning, such as 'NA' (not applicable).

- 2.4. **Observer:** Shellfish water impacts: EIA documents from Uisce Eireann - they identify that the discharge poses a danger to Class A shellfish waters. No reason given why UE did not produce evidence that the UV treated effluent at 20,000 cfu per 100ml would breach the safe levels for the designated shellfish area (Appendix 4.4). Contrary to OH commitments that the effluent would be 20,000cfu and no raw sewage would discharge to sea at all in event of process failure, updated EIAR now indicates there will be a discharge to the sea in the event of a process failure. Impact assessments need to reflect this. Queries acceptable levels of cfu in the water column and *E. coli* in razor clam. Levels required to maintain Class A shellfish waters is breached. Appendices 4.1-4.3 relate.

Applicant: (3.2.1.2.9) there was no change to the statements documented at the 2019 Oral Hearing that, a total failure of the Waste Water Treatment Plant (WwTP herein) cannot occur: resulting

discharge of untreated sewage to the marine environment would also not occur. The 2023 EIAR Addendum noted that for Risk ID 'F' (i.e. 'Discharge of untreated wastewater during Commissioning and Operational Phase'), there has been an update to the modelling for this scenario, included as part of Chapter 8A (Marine Water Quality): the 'Post-Mitigation Likelihood' for Risk ID 'F') was reduced from 'Unlikely' to 'Very Unlikely'. (3.2.1.2.10.9) the UV treatment system will be designed and operated to achieve a maximum of 20,000 cfu/100ml, with an average concentration in the order of 5,000 to 6,000 cfu/100ml, in the final effluent. Updated modelling demonstrated that there will be no impact on the designated shellfish water.

Review: The observer refers to evidence provided as part of the freedom of information request (Appendix 4.4 is provided in the Fol submission of Joyce-Kemper (ABP-312131-21-FI Submission 2 of 3; starting pg. 257 of that submission)). The use of Ultraviolet (UV) treatment to remove the risk of coliforms and other bacteria from waters is discussed at length below (see Section 3 with reference to Oral Hearing evidence). The use of UV to ensure effluents meet safe levels for shellfish water classifications are maintained is presented although as presented in the Oral Hearing evidence, is not necessary to ensure safe levels are maintained.

The observer also comments on the 'new' introduction of potential discharge under process failure. The risk assessment language under Section 9.5 (Chapter 9A, pg-13) is not clearly presented by the applicant and I understand the observer's comment. Specifically, "The only impact on water quality during the Operational Phase will be due to... or the potential discharge of untreated wastewater for a very short duration owing to a pumping failure". Response says "would also not occur" so these two statements are at odds on face value. However, I am satisfied that the actions outlined by the applicant in the event of a process failure will lead to little/no impact, but recommend that modification and/or simplification of the language is undertaken to make this more explicit to observers.

- 2.5. **Observer:** Cumulative impact AA: Re Razor Clam dredging - no impact assessment under EIA or AA on razor clam dredging in the Malahide Shellfish area.

Applicant: (3.2.1.2.15) this issue was considered in the EIAR. The impact was assessed to be high, but extremely localised through extraction (approximately 0.16km² (squared kilometres)) or smothering (1km²). However, as this species can vertically migrate within the sediments, the latter would not introduce significant mortality. No long-term damage of the seabed is expected as a result of the construction dredging, with sediment impacts to benthos or fish assessed to be of negligible magnitude or significance and of a short-term duration (refer to Table 9.23 of Chapter 9 in the 2018 EIAR).

Review: Impact on razor clam and the impacts of dredging were considered in the original risk assessment. Dredging is a restricted inshore practice, regulated by the Sea Fisheries Protection Authority. Shellfish and dredging activities are referred to in the cumulative effects chapter, but razor clam are not directly referred to as they were originally screened out with the risk assessment concluding the shellfish areas (which include razor clam; see Table 9.16 - pg 49 of Chapter 9 for all species identified). They were assessed as at low risk due to low magnitude and frequency of impact over a small area and assessed as 'negligible' significance (pg 66).

Additional scientific literature further supports this assessment of no risk to shellfish. An example includes Legani et al. (1998¹) who stated "Coliphage concentrations were significantly correlated with faecal indicators in marine waters ($P < 0.001$) and sediments ($P < 0.05$), but no correlation was found in shellfish, thus showing their low specificity as indicators of faecal pollution of human origin in shellfish of economic importance." No additional cumulative sources of impact were identified as overlapping with this area (Chapter 23A).

- 2.6. **Observer:** Marine outfall: There is a failure to assess works being carried out at either end of the marine outfall simultaneously, both for sediment dispersal and noise.

Applicant: (3.2.15.2.5) The proposed outfall pipeline (marine section) will involve the excavation of a trench within a 250m wide working corridor from the tunnel termination point out to the outfall location

¹ Legani et al. (1998) Journal of Applied Microbiology, 85(5): 790-798.

(approximately 4km), meaning there will not be works undertaken simultaneously at either end of the marine outfall.

Review: The response clearly states why a cumulative assessment of effects of sediment dispersal and noise is not needed.

2.7. **Observer:** Dredged section: queries if full extent of dredge profile is assessed.

Applicant: (3.2.15.2.6) a trapezoidal trench 5m deep and 5m wide at the base, results in the width of the top of the trench being approximately 22m (assuming trench side slope of 30 degrees). This trapezoidal trench is outlined in the design included in the 2018 planning application which has not changed, and is fully assessed in the EIAR

Review: It is recommended to modify the text to state explicitly that the full extent of the dredge profile (i.e. 22m width × 5 m depth) was assessed in the 2018 EIAR. See also comment on historical pollutants (2.2).

2.8. **Observer:** North-west Irish Sea cSPA (site code 004236); the project will now also be within the north-west Irish Sea cSPA and the Rockabil to Dalkey Island SAC. The route of the outfall pipeline from the Velvet Strand to the outfall discharge point off Ireland's Eye is encompassed in the new Natura site.

Applicant: (3.2.7.2.2) The revised NIS assesses the Rockabil to Dalkey Island SAC and the North-West Irish Sea candidate SPA.

Review: The revised Natura Impact Statement (NIS) has been completed extremely comprehensively, and I am confident in its conclusions. No modifications are recommended.

3. Report on the adequacy of the UV treatment as it relates to impacts on the marine environment

3.1. At the request of An Bord Pleanála (ABP), the Applicant has provided revised EIAR² and NIS³ documents in support of their application. ABP then made provision for consultation and comment from stakeholders, and a response to those submissions has been undertaken by Uisce Éireann. Section 2 above provides a review of the responses made in relation to potential impacts on the marine environment.

3.2. The consultation process led to queries in 2022 and 2024 around the impact of effluent on marine taxa (see comment 2.4 above).

3.3. The revised EIAR (Chapter 9A, 2023) introduced an update to the proposed project with respect to water treatment by Ultraviolet (UV) radiation. A summary of the update was provided in Tables 8.1 (pg. 1 of Ch. 8A) and 9.1 (pg. 1 of Ch. 9A). The outline description references UV in three ways:

- (a) UV Treatment is to be included in the treatment process at the proposed wastewater treatment plant (WwTP) in the northern section of the WwTP site;
- (b) The UV treatment system will be designed for the expected flows at the plant and will be installed on the final effluent line. UV treatment will be in operation 24 hours a day, 365 days a year.
- (c) The UV system will consist of a minimum of three and a maximum of four treatment units located below or partially below ground level and an above-ground Motor Control Centre (MCC) (in a kiosk) along with minor maintenance and control equipment (e.g. shut-off button, frame for supporting, retracting and cleaning of UV lamps etc).

² <https://www.gddapplication.ie/sites/default/files/planning-sites/greater-dublin-drainage/docs/environmental-documents/eiar-addendum/volume-3a-part-a/Chapter-9A-Biodiversity-%28Marine%29.pdf>

³ <https://www.gddapplication.ie/sites/default/files/planning-sites/greater-dublin-drainage/docs/environmental-documents/natura-impact-statement/Revised-NIS.pdf>

3.4. It is also referred to in Sections 8.2.4.2 “Operational Phase” (Ch. 8A, 2023) and 9.5 “Impact of the Proposed Project – Operational Phase” (Ch. 9A, 2023) and Oral Hearing documents.

Section 8.2.4.2 states:

“The modelling for the Operational Phase of the proposed outfall pipeline route (marine section) has been updated to account for the continuous discharge of secondary treated effluent with the inclusion of Ultraviolet (UV) treatment of Escherichia Coliforms (COLI) and Intestinal Enterococci (IE) (as outlined in Section 8.1) into the receiving waters for:

- *Average flow conditions; and*
- *Flow to full treatment (FFT) conditions.*

There has been no change to the scenario to assess the impacts of discharging untreated wastewater over a three-day period, simulating a process failure at the proposed WwTP, and therefore, there are no changes to this Section of the EIAR in the 2018 planning application.”

Section 9.5 states:

*“Following the construction of the proposed WwTP, **the inclusion of UV treatment for wastewater will not impact the marine biodiversity in the vicinity of the discharge. The only impact on water quality during the Operational Phase will be due to the treated wastewater discharge, or the potential discharge of untreated wastewater for a very short duration owing to a pumping failure in the proposed WwTP.** As outlined in Chapter 22A (Risk of Major Accidents and / or Disasters) in Volume 3A Part A of this Addendum EIAR, with consideration of all of the embedded measures included in the design of the Proposed Project and the additional mitigation measures outlined in Chapter 22 (Risk of Major Accidents and / or Disasters) in Volume 3 Part A of the EIAR in the 2018 planning application, the risk of a discharge of untreated wastewater during Commissioning and the Operational Phase to the marine environment is ‘Very Unlikely’. A risk category that is classified as ‘Very Unlikely’ is ‘not expected to occur’, as per A Guide to Risk Assessment in Major Emergency Management (Department of Environment, Heritage and Local Government 2010).”*

3.5. I refer to the statement in Section 9.5 Section 2.4 above, and the apparent incongruence of the statement of no impact/discharge of untreated effluent and “potential discharge” referred to here. No further reference is made to the UV treatment process in this document, however, an in-depth explanation of the UV treatment is provided in the Oral Hearing evidence of 2019.

3.6. UV treatment has been shown to be effective in reducing contamination of effluents to safe levels. The Freedom of Information request by Joyce-Kemper (file reference: 2022 “ABP-312131-21 - Submission Sabrina Joyce-Kemper - Appendix A4.pdf”) refers to advice compiled by Jacobs on behalf of the applicant that likely underpinned the initial design and initial decision to not treat effluent with UV.

This Fol documents refer to expert advice solicited from Dr Marja Aberson in 2019, who provided a detailed summary of the potential uptake by bivalve molluscs (shellfish) under differing concentrations of *E. coli* in seawater with respect to the potential risk to shellfish from *E.coli* contamination. That advice leant heavily on evidence produced by Cefas (Centre for Environment, Fisheries and Aquatic Science data); a highly reputable source. The observer suggests that “nowhere in the summary of advice suggests that additional treatment should be applied to the effluent”. They argue that the absence of this statement by Dr Aberson infers that no additional treatment could be recommended to ensure safe levels of *E.coli* (see pg. 8 of 2022 submission “ABP-312131-21 - Submission - Sabrina Joyce-Kemper.pdf”) and invoke the precautionary principle on the basis of a paucity of data.

There are clear differences in uptake by different mollusc species that can make generalisation of effects challenging. The precautionary principle can be applied to *Ensis* sp. (razor clams) given the lack of data for this species as acknowledged in that Fol documentation. However, cockles (*C. edule*) biologically function in a similar way to razor clam such that they are a good equivalence (model) species to use as indicators of response.

Appendix A4 (as referred to above) outlines what is known about the link between environmental *E.coli* and in-tissue concentrations. It is crucial to differentiate between the very low cfu limits found in

tissues in microcosms (closed systems) in comparison to **natural settings where environmental concentrations must be significantly higher** to breach shellfish standards thresholds (see Appendix A4; Table 2 and 3 in Appendix B therein).

It is also made clear that *E.coli* is cleared rapidly from tissues if stocks are exposed to clean water. Such approaches to 'depurate' shellfish is common practice by industry. As such, the evidence supports the original assessment of negligible risk to shellfish contamination by *E.coli* and other biological contaminants.

Given best available evidence, the original position that UV would not necessarily be needed (see Oral Hearing documents "UV Disinfection Response to Inspector" statement) is supported. However, the applicant's subsequent intention to apply UV treatment to effluent prior to discharge provides additional security to absolutely ensure that waters remain safe such that the classification of shellfish waters in the region are not undermined. The witness statement by Dara White (Oral Hearing 22 March 2019) reiterates the efficacy of the approach and was accepted by the oral hearing. On this basis, the use of UV is considered a reasonable action to mitigate any, if unlikely, risks to shellfish from *E. coli* and other coliforms and bacteria.

4. Report on the adequacy of the revised NIS, focusing on (i) marine-related sites and (ii) the North West Irish Sea cSPA (Section 4)

- 4.1. Review of the revised NIS shows a comprehensive and robust analysis of the potential threats to nature features in the region around the proposed WwTP. The review of existing marine sites and the new North-West Irish Sea cSPA is comprehensive and detailed. The cumulative (combined) assessment is also extremely thorough and should be used as an exemplar for future NIS statements.
- 4.2. It is my opinion that the risks associated with the WwTP have been fully identified and appropriately assessed for any potential risks and I am comfortable in recommending that the Applicant has made the effort to ensure due diligence of the environment has been made under their proposal.