



### Submission

Submitter:	Mr Gordon Reid
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### Application

Applicant:	Dairygold Co-Operative Society Ltd and TINE Ireland Ltd
Reg. No.:	P1103-01

See below for Submission details.

Attachments are displayed on the following page(s).

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**Submission to the Environmental Protection Agency  
on the licence application by Dairygold Co-Operative Society Ltd and TINE Ireland Ltd  
Licence application registration number P1103-01**

**Submitted by Gordon Reid on behalf of:**

- 1. Green Party/Comhaontas Glas**
- 2. Dr Gordon Reid**
- 3. Catriona Reid**

My name is Gordon Reid; I am a retired senior lecturer in physiology from University College Cork. I gave extensive evidence to the 2016 An Bord Pleanála oral hearing on the Ringaskiddy incinerator proposal by Indaver (PL04.PA0045), including exposing serious problems with the dioxin modelling that Indaver had submitted with the application. I have also acted as an expert witness for Limerick Against Pollution in the 2017 An Bord Pleanála oral hearing on the appeal of permission granted to Irish Cement (PL91.248285). My daughter Catriona is a young and experienced environmental activist, who has published a book on the Indaver oral hearing. We are jointly submitting this objection on our own behalf and on behalf of the Green Party/Comhaontas Glas, of which we are both active members.

We are concerned about the Natura Impact Statement and associated documents accompanying the present application from Dairygold/TINE, on the following grounds.

1. Lack of acknowledgement in the NIS that upstream pollution (i.e. into the Great Island Channel) would cause adverse effects on water quality in a part of Cork Harbour that is categorised as both SAC and SPA.
2. Lack of acknowledgement in the NIS of the adverse effect of pollution released downstream (i.e. into other parts of the Cork Harbour) on the protected species in Cork Harbour SPA.
3. Lack of analysis in the NIS of the possible deposition of fats, oils and grease (FOG) on the surface of mudflats, and the effect of such deposition on feeding birds
4. Erroneous claims in the NIS that there will be “no significant effect on water quality”.

Based on the above four points, we consider that the Appropriate Assessment process should not have stopped at stage 2 (the NIS), because the NIS is erroneous in its conclusion that there is no risk to the habitats and protected species of the Great Island Channel SAC and Cork Harbour SPA. For this reason we suggest it should have been continued to stage 3, the consideration of alternatives to the release of waste water into the sea. Many local residents have suggested alternatives, including constructed wetlands, short rotation willow coppice, and the use of the grey water to irrigate farmland. In 2009, a report for Cork County Council investigated the potential for release at alternative sites other than Rathcoursey. These alternatives were supplied to Dairygold during the planning application process, and should have been given consideration in the EPA licence application, but are not mentioned in it.

References in what follows to the Natura Impact Statement, and documents appended thereto, relate to the PDF document to be found at this link:

[http://www.epa.ie/licences/lic\\_eDMS/090151b2806d6d6c.pdf](http://www.epa.ie/licences/lic_eDMS/090151b2806d6d6c.pdf). Where mention is made of “the PDF document” in relation to the NIS or documents appended to it, it is this PDF that is meant.

We note that a revised NIS was submitted on 6th June 2019, in response to the Agency's request of 13th March 2019 to clarify the intended mitigation measures (this is Appendix 4 of [http://www.epa.ie/licences/lic\\_eDMS/090151b2806f4418.pdf](http://www.epa.ie/licences/lic_eDMS/090151b2806f4418.pdf)). Some parts of the original NIS are no longer included in the revised NIS, and it is unclear why they are no longer present, because they have nothing to do with mitigation. We have retained comments on the original NIS, on the assumption that anything not explicitly withdrawn by the applicant is still considered to be valid and to form part of the application documentation.

All references to page numbers, figure and table numbers refer to the original NIS ([http://www.epa.ie/licences/lic\\_eDMS/090151b2806d6d6c.pdf](http://www.epa.ie/licences/lic_eDMS/090151b2806d6d6c.pdf)).

## **1. Upstream pollution into Great Island Channel SAC**

A particular point of concern is that pollution released from the Rathcoursey outfall on the ebb tide will be carried upstream into the Great Island Channel (a designated SAC, and part of the Cork Harbour SPA) on the incoming tide. This is especially worrying because this SAC habitat type is already considered to be in unfavourable-inadequate conservation condition (stated in the NIS, page 37; page 45 of the PDF document).

The position of the outlet through which effluent from the Mogeely plant is proposed to be released is shown in figure 8 on the page just mentioned. It is only a few metres to the south of an area that is included in both the Great Island Channel SAC and the Cork Harbour SPA.

On page 36 of the NIS (page 44 of the PDF document), it is claimed that "As discharges will be on an ebb tide, effluent will be carried away from the Natura 2000 designated areas of the receiving waterbody...The discharge will quickly diffuse into the overall waterbody and owing to the ebb tide, will be carried out and away from the SAC/SPA." The possibility that pollutants will accumulate, because the water that has just flowed out on the ebb tide (into the restricted space of Cork Harbour) will return on the incoming tide, is rejected by the NIS: "Discharging on an ebb tide only will allow the effluent to be flushed out of the receiving environment. Over the 6+ hour period between ebb tides, water will undergo an ~80% exchange so that the subsequent discharge event will occur on new water coming in rather than the column which has gone out on the preceding ebb tide."

The source of the 80% exchange is not stated, nor the basis for this estimate. The actual value is very much lower: in 1977, a dye release study for Cork County Council measured a value of 0.35. This 1977 study is included in a 2017 report compiled by Irish Hydrodata Ltd for Irish Water, which is appended to the NIS (Document Ref. No. 1207/3/17, beginning at page 130 of the PDF document). The value of 0.35 can be found on page 8, paragraph 1, of the Irish Hydrodata report (top of page 141 of the PDF document). This lower exchange factor obviously increases the likelihood of mixing and accumulation of pollution, which, not being washed out on the ebb tide, will return on the incoming tide and end up in the Great Island Channel. The extremely long residence times reported in a 2012 study (Hartnett et al, 2012; see figure shown at the top of page 6 of this document) suggest the exchange in parts of the Great Island Channel is very substantially less than the value of 0.35.

This effect was directly measured in the 1977 dye release study, and the results are shown in figs. 2.7 & 2.8 on page 9 of the Irish Hydrodata report mentioned above, which is page 142 of the PDF document linked above). Dye was released during only part of the ebb tide (3.5

hours of it, from high water + ½ hour until high water + 4 hours), for 5 days, then the concentrations measured at high and low water. An important observation is that dye concentration in the Great Island Channel at low water remains at around two thirds (4 ppb) of the high water concentration (6 ppb), indicating that dye moves upstream from Cork Harbour into Great Island Channel on the incoming tide, even though it was released only on part of the ebb tide and ceased two hours before low water.

It should be noted that the proposed discharge in the present licence application would be 5.75 hours per ebb tide (see section 3.1 of the Irish Hydrodata report, page 11, page 144 of the PDF document [http://www.epa.ie/licences/lic\\_eDMS/090151b2806d6d6c.pdf](http://www.epa.ie/licences/lic_eDMS/090151b2806d6d6c.pdf)), and the permitted discharge period would cease only 30 minutes before a flow tide (see letter from Irish Water to EPA, 18th April 2019, [http://www.epa.ie/licences/lic\\_eDMS/090151b2806ea329.pdf](http://www.epa.ie/licences/lic_eDMS/090151b2806ea329.pdf), page 3). This longer duration of discharge would obviously reduce still further the effectiveness of the washout, as compared with the 3.5 hour release period in the 1977 dye study mentioned above, and would increase still further the mixing, accumulation and upstream pollution in the Great Island Channel.

During the Council's review of the original planning application, we submitted an observation drawing attention to a citizen science project that confirms the above dye dispersion study, using measurements of nitrogen at a number of points around East Ferry and the Great Island Channel. It was carried out some years ago by Transition Year students at Midleton College, under the guidance of science teacher Ray Power. Mr Power reports that they found pollution levels to be increased upstream of the Rathcoursey outlet, in the Great Island Channel SAC, linked to sewage release from Rathcoursey. What was most interesting about this study, according to Mr Power, was that the increases in nitrogen levels were recorded not only through the Ferry and into the harbour area but also back up through the Great Island Channel towards Brown Island and Knocknastooka; this seemed to provide evidence that the outgoing tide did not pull all the sewage with it.

In response to such concerns expressed by ourselves and others, the Council requested further information from Dairygold, including a modelling study of the fate of material released from the Rathcoursey outlet. This modelling study confirmed and increased our concerns. It forms part of the Irish Hydrodata report appended to the NIS for the current application. Modelling of the levels of nitrogen, phosphate and BOD at present, and how they would change with the added effluent from Dairygold, are shown in Figs. 4.9-4.16 of the Irish Hydrodata report (on pages 158-169 of the PDF). The conclusions are very worrying indeed, indicating that parts of the Great Island Channel SAC would suffer very substantial increases in the modelled pollutants, with parts of the SAC no longer being in "good" condition (having moved above the threshold of 0.25 mg/l) with regard to nitrogen (DIN).

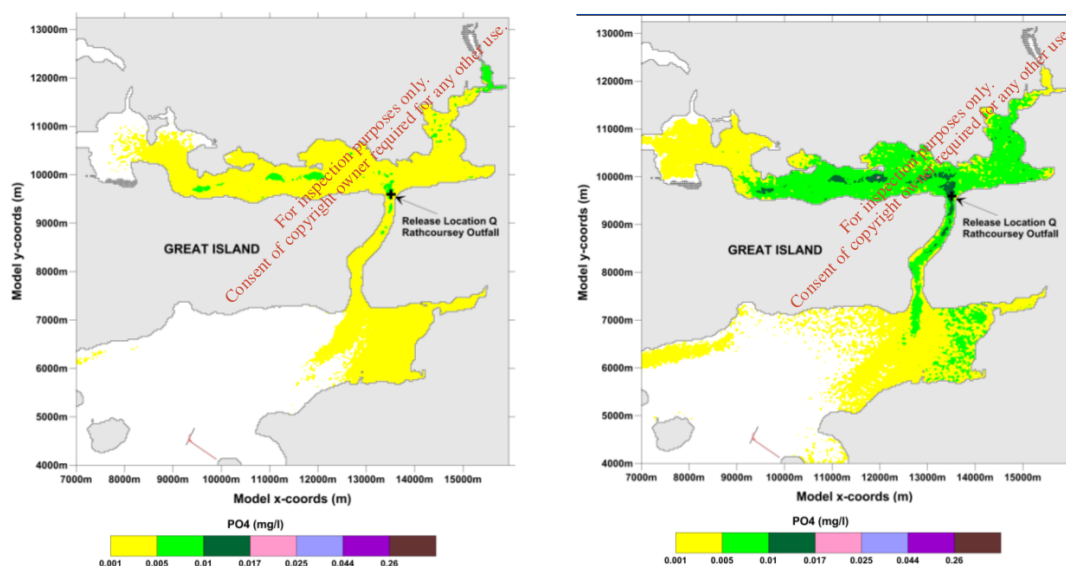


Fig. 1: Concentrations of phosphate ( $\text{PO}_4$ ) without (left) and with (right) the effluent from the proposed Dairygold plant, as revealed by the modelling included in the Irish Hydrodata report (Figs 4.13 and 4.14 of the report). The  $\text{PO}_4$  load is predicted to rise from 21.8 to 43.1 kg/day, an approximate doubling. The rise in concentration in the Great Island Channel (north of the Rathcoursey outflow) is obvious.

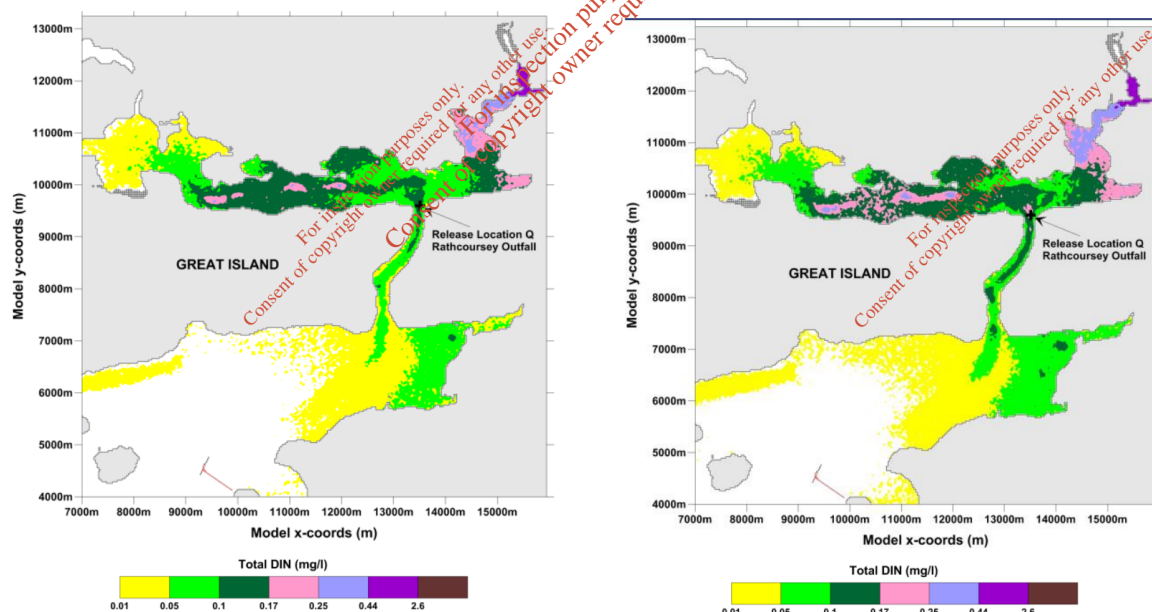


Fig. 2: Concentrations of dissolved inorganic nitrogen (DIN) without (left) and with (right) the effluent from the proposed Dairygold plant, as revealed by the modelling included in the Irish Hydrodata report (Figs 4.9 and 4.10 of the report). Note the blue areas in the Great Island Channel in the right-hand panel. These areas have risen above the threshold of 0.25 mg/l that defines “good” water quality (i.e. the water quality is predicted to no longer be “good” once the Dairygold plant is operating).

None of this is surprising, in our view. The assumption expressed in the NIS that release on the ebb tide means that effluent will flow away from the Great Island Channel SAC is excessively simplistic. At the end of the ebb tide, water is hardly moving; therefore release will be into a largely static column of water above the outlet. In addition, the release will be at the lowest water level (low tide), i.e. into the minimum volume of water, with the result that the highest concentration of pollutants will be at low tide.

The calculations of pollutant concentration (BOD, table 6, page 35-36 of NIS, pages 43-44 of PDF) assume instantaneous complete mixing of released pollution into the entire volume of water flowing out of the Great Island Channel (the tidal prism at Rathcoursey Point), to arrive at a low concentration of BOD in the water. This assumption is so unrealistic as to be fictional. There is no instantaneous complete mixing - wastewater will be released into whatever volume of seawater is above the outlet pipe at the time of release, and near low tide this will be at a low level and static. Released pollution will be at its maximal concentration at low tide, and the effluent (in particular the fat, oil and grease (FOG) component) will float towards the surface, as is acknowledged in the NIS. When the tide turns, this water, containing effluent at its highest concentration, will flow upstream into the Great Island Channel SAC.

The findings of the 1977 dye study, and the Midleton College citizen science project, are thus entirely to be expected, and are supported by the more recent modelling study in the 2017 Irish Hydrodata report appended to the NIS ([http://www.epa.ie/licences/lic\\_eDMS/090151b2806d6d6c.pdf](http://www.epa.ie/licences/lic_eDMS/090151b2806d6d6c.pdf), beginning at page 130 of the PDF document).

## **2. Lack of consideration in the NIS of the fate of pollution released downstream (i.e. into the Cork Harbour SPA)**

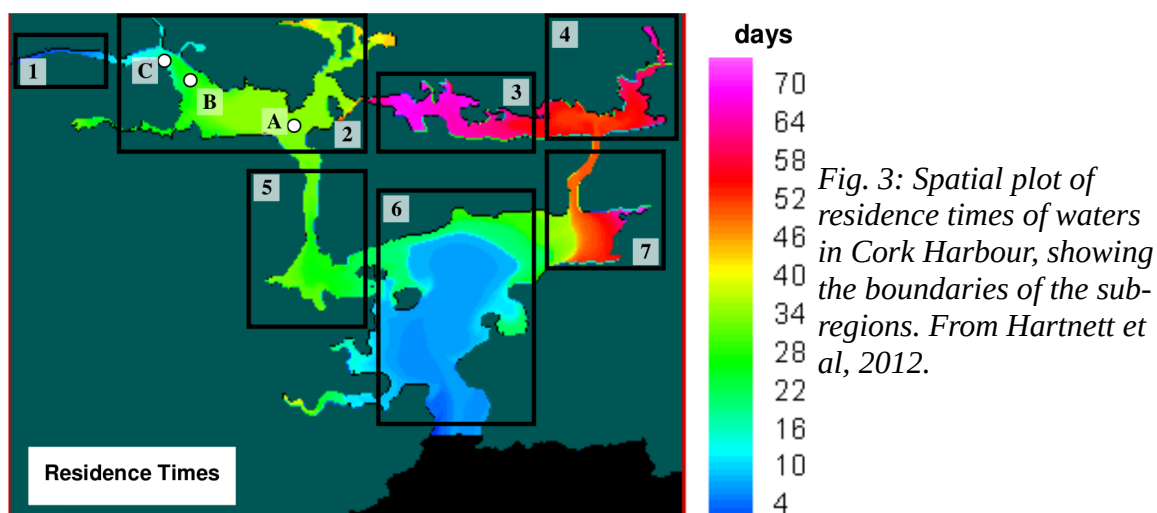
That fraction of the effluent that does flow southwards on the ebb tide, as intended, will end up in the channel at East Ferry and thence into the lower harbour. The mudflats in the lower harbour also form part of Cork Harbour SPA.

The NIS contains no detailed consideration at all of where the released effluent will end up in the harbour. After relying on the calculation of concentrations based on instantaneous complete mixing with the tidal prism at Rathcoursey Point (table 6, page 35 of the NIS, as mentioned above), it is assumed that the concentrations of BOD and other pollutants will be so low as to be insignificant. No consideration is given to accumulation of pollutants in the lower harbour. This would be a valid approach only if the ebb tide going into the lower harbour emptied the harbour completely into the sea, to be replaced by completely clean seawater on the next incoming tide. Of course this does not happen! The lower harbour is a large body of water that connects through a narrow channel with the ocean. Only a fraction of the water in the Harbour leaves it into the sea with each tide. Most of it remains within the harbour. It is therefore inevitable that pollution released into the harbour will accumulate over time. No consideration is given to this accumulation.

The time course of accumulation can be appreciated based on a modelling study by NUI Galway (Hartnett, M, Nash, S, Olbert, I “An integrated approach to trophic assessment of coastal waters incorporating measurement, modelling and water quality classification”. Estuarine Coastal And Shelf Science, 112 :126-138, 2012). This shows that residence times of



waters in Cork harbour can be over 60 days; in the region of the Rathcoursey outflow and the East Ferry channel, it is around 50 days.



The NIS therefore does not give an adequate basis to conclude beyond reasonable scientific doubt that there can be no adverse effects on the protected species in the lower Cork Harbour SPA, because no realistic consideration has been given to accumulation of pollution over time in the restricted space of Cork Harbour, and the calculation of pollutant concentrations is so unrealistic.

### 3. Lack of analysis in the NIS of the possible deposition of fats, oils and grease (FOG) on the surface of mudflats, and the effect of such deposition on feeding birds.

It is accepted in the NIS (page 36; page 44 of the PDF document) that the effluent being released is less dense than sea water, so will rise towards the surface. This is particularly the case for fats, oils and grease (FOG).

The licensed release of FOG is not clear, because “the discharge standards for the Mogeely treated wastewater have not yet been agreed with the EPA”(page 33 of the NIS). The likely value given in the NIS is based on that licensed for Irish Distillers, 15 mg/litre. It is obviously difficult to exclude reasonable scientific doubt on the effects of a pollutant when we are not told how much is to be released; but leaving that aside, we can calculate the possible release based on the Irish Distillers licence values.

The maximum wastewater volume provided for in the application is 4000 m<sup>3</sup>/day. With a licensed FOG concentration of 15 mg/litre (i.e. 15 g/m<sup>3</sup>), this means that 60 kg/day FOG would be released into the harbour, or nearly 22 tonnes per year.

The actual FOG levels to be expected, and the compliance record of Dairygold, can be judged on the basis of the Annual Environmental Reports from its three cheese plants in Co. Cork (Mogeely, Mitchelstown, and Mallow). The company, at public meetings, has emphasised that they “work to” a remarkably low level of FOG concentration, but closer questioning revealed that “work to” means a target value, not a value regularly attained. The AERs show that Mitchelstown has on occasion greatly exceeded the value given above (up to 33 mg/litre in one month in 2013), and Mogeely’s release is irregular and on occasions right up to the

predicted 15 mg/litre limit. It would therefore not be safe to assume a release any lower than the licence limits.

When the tide goes out, the layer of FOG near the surface of the water will be deposited on the mudflats that are exposed at low tide. These mudflats are the feeding grounds for a number of bird species that are protected, and whose conservation status is a matter of concern (as listed in the NIS). The NIS states that birds feeding in the intertidal zone are “unlikely to be impacted by operational discharges, as these species are unlikely to be present during discharge events”. It is naïve to assume that birds would only be affected if they were near the outflow pipe during discharge: the surface deposition of FOG on the mudflats would take place as the tide went out, and birds would be feeding on the mudflats.

Surface deposition of FOG on the mudflats at low tide is not mentioned at all in the NIS. The NIS therefore gives no basis on which to exclude adverse effects on intertidal feeding species “beyond reasonable scientific doubt”.

#### **4. Erroneous claims in the NIS that there will be “no significant effect on water quality”.**

Page 39 of the NIS (page 47 of the PDF document

[http://www.epa.ie/licences/lic\\_eDMS/090151b2806d6d6c.pdf](http://www.epa.ie/licences/lic_eDMS/090151b2806d6d6c.pdf)) states that “there will be no significant elevation in nutrient or BOD concentrations owing to the proposed WWTP discharge within the receiving water either alone or in combination with the other discharges”, and “the concentration of nitrogen and BOD will have no discernible effect on the receiving waters.”

On page 36, tables are given showing the predicted rise in BOD. Below these tables, it is stated: “As can be seen from the above figures the average impact of the proposed maximum strength discharge from the Dairygold Mogeely WWTP would be to raise the background BOD, outside the mixing zone, by 0.0039 mg/l. This would have no discernible effect on the receiving waters. Furthermore, the cumulative BOD rise in BOD outside the mixing zone would be 0.0092 mg/l. Even the overall effect of the combined discharges from Midleton, IDL and Dairygold, Mogeely has a negligible impact on the receiving waters.”

These parts of the NIS were written and submitted (as part of the original planning application to the Council) before the Irish Hydrodata report was included in it. The obvious need for revision of these conclusions, in view of the findings of the Irish Hydrodata report, had clearly been overlooked in the current application at the time the original NIS was submitted with the current application ([http://www.epa.ie/licences/lic\\_eDMS/090151b2806d6d6c.pdf](http://www.epa.ie/licences/lic_eDMS/090151b2806d6d6c.pdf)).

It is therefore very interesting to note that these claims have been quietly dropped from the latest revision of the NIS ([http://www.epa.ie/licences/lic\\_eDMS/090151b2806f4418.pdf](http://www.epa.ie/licences/lic_eDMS/090151b2806f4418.pdf), Appendix 4), although no request for such a revision had been made by the EPA.

Perhaps the applicant now recognises that the assumption of immediate total mixing of the effluent with the entire volume of the tidal prism was an unrealistic assumption, and that, consequently, it can no longer be claimed that there would be “no discernible effect on the receiving waters”, or that the impact would be “negligible”. The increase in concentration of phosphate and nitrogen is clear from the modelling data shown in the figures above. The



potential for accumulation of pollutants is evident from the data on residence times, also shown above.

In this regard, like the others mentioned above, the NIS does not give any basis to conclude beyond reasonable scientific doubt that there will be no adverse effects on water quality, on protected species, or on the habitats comprising the Great Island Channel SAC and Cork Harbour SPA.

## **Appropriate Assessment**

As part of the application process, because the proposal potentially impacts on two European protected sites (the Cork Harbour Special Protected Area and the Great Island Channel Special Area of Conservation), it is necessary to carry out Appropriate Assessment as specified by legislation. The legislative framework is laid down in the Habitats Directive (92/43/EEC) and the Birds Directive (79/409/EEC), and transposed in the European Communities (Birds and Natural Habitats) Regulations 2011.

The assessment in this application has stopped after the second of the four stages of Appropriate Assessment. After the first stage (screening), the second stage is the detailed analysis in the Natura Impact Statement. If the NIS cannot rule out adverse impacts on species protected in the SAC and SPA sites, the analysis should proceed to stage 3, the assessment of alternative solutions. If no suitable alternatives exist, stage 4 considers whether there are “imperative reasons of overriding public interest” for allowing a plan or project to adversely affect a Natura 2000 site.

According to European Court of Justice rulings, and decisions of the Irish courts, the standard of proof required to conclude that there are no potential adverse effects is a very strict one. It must be shown that there is “no reasonable scientific doubt as to the absence of such effects”.

Based on the four grounds above, we consider that stage 2 of the Appropriate Assessment in this application should have concluded that the possibility of adverse effects cannot be excluded to the standard of proof required by law. We therefore consider that the applicant should be required to proceed to the third stage, and to consider alternatives to the proposed discharge of wastewater into the Harbour.

## **Alternatives**

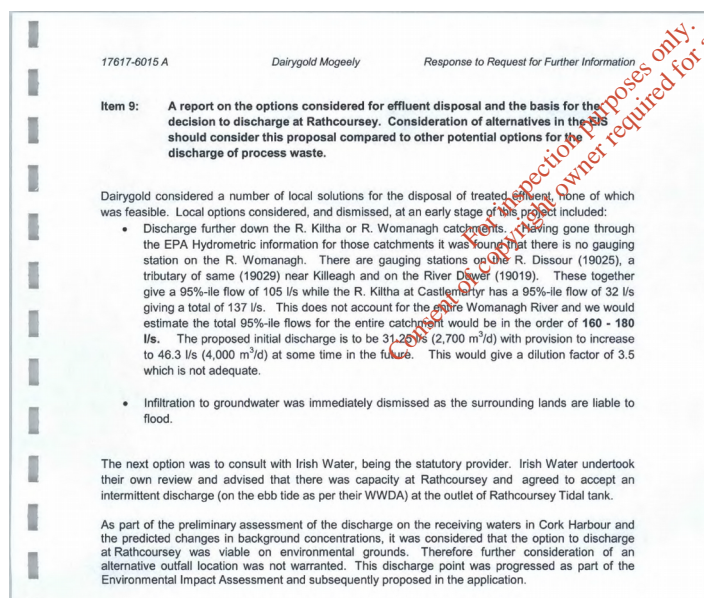
We suggested to the Council during its consideration of the planning application, and to An Bord Pleanála during its consideration of the appeal, that Appropriate Assessment should have gone beyond stage 2 (the NIS) to stage 3 (consideration of alternatives), and we make that suggestion again here.

Possible alternatives include: constructed wetlands; irrigation of short rotation willow coppice; irrigation of farmland; and disposal of effluent directly into the ocean, instead of into Cork Harbour. These have all been suggested in detail to Dairygold and the public authorities during consideration of the planning application by the Council and An Bord Pleanála, and Dairygold has not seriously considered any of them. In the present application, Dairygold has not even mentioned the existence of alternatives or any consideration given to them.

All the suggested alternatives would completely avoid the release of pollutants into the waters of Cork Harbour, and thus avoid the possible adverse effects on protected species of the SAC and SPA that are mentioned above.

It is our understanding that under Regulation 42(12) of the European Communities (Birds and Natural Habitats) Regulations 2011, Appropriate Assessment should take account of “any written submissions or observations made to the public authority in relation to the application for consent for proposed plan or project”, which would imply that alternatives suggested in formal submissions should be given consideration during the process.

The Council did indeed request further information from Dairygold on the consideration of alternatives to discharge at Rathcoursey. The response from Dairygold (below) was little more than half a page in length and contained no detailed analysis of the environmental impact of any alternatives. It stated that “As part of the preliminary assessment...it was considered that the option to discharge at Rathcoursey was viable on environmental grounds. Therefore further consideration of an alternative outfall location was not warranted”. As detailed above, we would suggest that this “preliminary assessment” is an unsatisfactory consideration of alternatives to the Rathcoursey outfall, and is inadequate to satisfy the requirements of the relevant European directives.



*Fig. 4: The response from Dairygold to Cork County Council's request for further information on the planning application for the Mogeely plant, submitted on 29th May 2017.*

*To our knowledge this is the only information or statement from Dairygold on the consideration of alternatives to discharge of effluent at Rathcoursey.*

It is our understanding of the judgement in a recent case at the Court of Justice of the European Union, Case C-461/17 (Brian Holohan and Others v An Bord Pleanála), that full and proper consideration should have been given to the environmental impact of each of the alternatives, as expressed in paragraph 69 of the judgement: “Article 5(3)(d) of the EIA Directive must be interpreted as meaning that the developer must supply information in relation to the environmental impact of both the chosen option and of all the main alternatives studied by the developer, together with the reasons for his choice, taking into account at least the environmental effects, even if such an alternative was rejected at an early stage”.

## Mitigation

The EPA requested the applicant on 13th March 2019 to “update the Natura Impact Statement (NIS) to address mitigation measures”. The request referred to section 8.1 (residual impacts) of the NIS, which states that “Provided that the mitigation measures (from section 7.8) are implemented in full, it is not expected that significant impacts will result to the features of interest identified for appraisal in this NIS”. Section 7.8 was missing from the original NIS, so the applicant was requested to “Provide a clear, concise list of mitigation measures that will be implemented on site to avoid, reduce or offset negative impacts from the operation of the installation on SPA’s and SAC’s. The mitigation measures should also include a timeline for implementation, a clear explanation of how the measure will address the likely significant effect from the continued operation of the installation and should mitigation failure be identified, how that failure will be rectified.”

In the revised NIS ([http://www.epa.ie/licences/lic\\_eDMS/090151b2806f4418.pdf](http://www.epa.ie/licences/lic_eDMS/090151b2806f4418.pdf)), section 8.1 has become section 8, but the text is almost unchanged: “Provided that the project design mitigation measures (from section 7) are implemented in full, it is not expected that significant impacts will result to the features of interest identified for appraisal in this NIS and thus it is not expected that the proposal will have an adverse impact on Natura 2000 sites.”

The mitigation measures referred to are listed in sections 7.1 (construction phase) and 7.2 (operational phase).

As far as we can tell from this, no details have been provided on the last point in the EPA’s request, the effects of mitigation failure and how such failure will be rectified. It appears to be assumed that the measures proposed will always work. This is unrealistic. Any industrial process is subject to failure, whether because of design faults, mechanical/electrical faults, or human error. If nothing ever went wrong, we would never see an exceedance in an AER. It is therefore unsatisfactory to simply state that nothing will go wrong if the proposed mitigation measures are implemented in full. This does not answer the EPA’s request.

## Conclusion

The purpose of this submission has been to demonstrate that it is essential, if the assessment required by the Directives is to be carried out properly, that the applicant be required to proceed to the third stage of Appropriate Assessment and to properly explore the environmental impact of alternatives to discharge at Rathcoursey: both the alternatives already summarily rejected by the developer during the planning process and omitted from the present NIS, and the alternatives proposed in submissions made to the public authorities (the Council, An Bord Pleanála and the EPA). The applicant should also be required to respond fully to the EPA’s query on mitigation failure.

We hope it has achieved these aims.

Gordon Reid  
Catriona Reid  
30 June 2019