Eve O'Sullivan

Subject: Observation re: S0026-02
Attachments: Submission re Dumping at Sea licence application_S0026-02.pdf

From: Melina Sharp [redacted]
Sent: Friday 22 December 2023 18:54
To: Licensing Staff <licensing@epa.ie>
Subject: Observation re: S0026-02

Dear Sir/ Madam,

Please find attached submission regarding the Aughinish Alumina Ltd. application for dredging and dumping at sea license, application ref. S0026-02 as advertised on Wed 22nd Nov 2023 in the Weekly Observer.

Sincerely,
Mélina Sharp and Michael Eversen.

ENVIRONMENTAL PROTECTION AGENCY
PO BOX 3000
JOHNSTOWN CASTLE ESTATE
WEXFORD
Co. WEXFORD
Y35 W821

22nd December 2023

Re: Submission
EPA Reg No S0026-02 Dumping at Sea Permit Application from Aughinish Alumina Ltd.

Dear Sir or Madam,

We, as concerned citizens, hereby make a submission in the relation to EPA Reg No S0026-02 Dumping at Sea Permit Application from Aughinish Alumina Ltd. in the Shannon Estuary.

For the following reasons, we believe that the dredging and Dumping at Sea license should not be given:

1. Dredging

Despite the tests carried out on the proposed dredging site, local knowledge tells us that there is a high likelihood of higher heavy metal content, toxins and radioactivity in the sediment around the AAL complex. Due to avoidable and unavoidable errors and spillages during unloading of raw bauxite and the loading of alumina for export, we believe that a build-up of both these substances will be present in the sediments on the sea floor in zones A to D of the dredging application.
Furthermore, due to the long-term leakage from the original unlined BRDA into the River Shannon it is also believed that high levels of toxicity and radioactivity are present in the sediment in question.

The act of dredging and proposed ploughing of this likely contaminated sediment will disturb any wildlife that is still surviving around the AAL complex. It also will cause an enlargement of the contaminated area leading to further loss of habitat and wildlife in the surrounding areas.

2. Dumping at Sea

According to the *'Screening for Appropriate Assessment Report'* prepared by MWP, submitted by AAL, the SFPC Dump Site off Foynes Island with EPA No. S0009-03 (8.4ha) was chosen for its close proximity to AAL.

This area is now a new toxic zone which was created by the EPA and the Department of Environment (DECC), together with AAL during the dumping campaign covered by the previous Dumping at Sea License, based on the sediment analysis presented by AAL for this application.

In the Netherlands approximately '*1/5 of dredging sludge is contaminated with heavy metals, polycyclic aromatic hydrocarbons (PAHs) and mineral oil. The fraction of this that is too heavily contaminated under the terms specified in the Seawater Pollution Act must be emptied into a dredge spoil pit'* [1].

So, most likely, the Shannon estuary with all other industry and port activities going on, the dredging sludge would be contaminated with heavy metals, PAHs and mineral oil.

[1] https://www.noordzeeloket.nl/en/policy/north-sea-natura-2000/natura-2000-stakeholders/dredging-dredge-spoil/

We can safely assume that if the dredge material was 'safe' or 'clean', AAL would have used it as an asset and would have sold it on to others.

The sheer volumes of material, 668,454 tonnes, comparable to 7,400+ whales, applied for in the AAL application to be disturbed and dumped in the environment will have a significant impact on marine life, benthic life and possibly on human health when taking into account, fishing, swimming and the wider degradation of our ecosystems. Swimming and fishing activities are not limited to official locations, how can the EPA ensure that the dredging/ dumping will not affect public health. Also, the timeframe of 24ht/day for 21 days, twice a year is disruptive to wildlife and is not insignificant.

For this reason, the contaminated dredged sediment cannot be dumped at sea and needs to be brought to land and contained and monitored appropriately to avoid further damage to aquatic life.

3. The importance of Water

On 28 July 2010, the United Nations General Assembly explicitly recognised the Human Right to Water and Sanitation and acknowledged that clean drinking water and sanitation are essential to the realisation of all human rights.

The report *'The State of Food and Agriculture 2020'* by the Food and Agriculture Organisation of the UN, states that '*3.2 billion people live in agricultural areas with high to very high water shortages or scarcity*' [2].

The Intergovernmental Panel on Climate Change (IPCC) once stated that '*By 2030, about 250 million people may experience high water stress in Africa, with up to 700 million people displaced as a result*'. [3]

'*Every year, the mining industry dumps 220 million more tonnes of mining waste into our oceans, river and lakes'*.[4]
'Every year, every single year, the mining industry pollutes 64-102 billion litres of water'.[5] *'This amount of water, should it be protected, could supply up to 5.5 million human beings according quantities given in the UN General Assembly, 2010 statement on the Human Right to water that is safe, accessible and affordable'*.[6]

Ireland has a constantly bad track record of protecting water. The state has failed its citizens and ecosystems over and over, and this has been picked up in court cases brought forward by the EU against the State. This all takes far too long, and the most efforts made by the State is to fight the court cases, not to start protecting the water. As can be seen below, in Ireland, '*The number of remaining high-status sites (High status rivers are those considered to be in pristine condition and rich in biodiversity) has declined from 31.5% (1987-1990) to 19.9% (2017-2020), representing an almost 37% decline in number according to EPA data'*.[7]

3.1 Water Framework Directive

Since the year 2000 there has been an EU Water Framework Directive, and it took the Irish State three years to adopt it. To this day the State is failing to comply. Immediate actions need to be taken, for health and survival of ecosystems.

> *'The European Commission refers Ireland to court because it still fails to achieve compliance with the requirements of the Water Framework Directive (WFD). Ireland*

[2] https://www.fao.org/state-of-food-agriculture/2020/en/
[3] https://www.climate-refugees.org/spotlight/2022/3/3/ipcc-africa
[4] idem
[5] https://earthworks.org/issues/mining/
[6] idem
[7] https://www.gov.ie/en/press-release/e6578-20-million-waters-of-life-project-to-protect-six-of-irelands-pristine-river-catchments/

adopted the WFD in 2003 but did not legislate for the regulation of large scale water abstraction from rivers and lakes for industry, commercial and other purposes'.[8]

'The water directive establishes a framework for protecting inland surface waters, transitional waters, coastal waters and groundwater by preventing their further deterioration, preventing pollution as well as protecting and enhancing water-dependent ecosystems and water resources.'[9]

'It requires all inland and coastal waters "reach at least good status by 2027 at the latest". To achieve this, member states were required to establish river basin management plans and programmes with measures.'[10]

3.2 Wastewater Treatment

'The European Court of Justice (ECJ) has found that Ireland has failed to uphold EU law in relation to almost 30 wastewater treatment schemes across the country.

The court's ruling released yesterday opens the door for Ireland to be hit with heavy fines for breaching EU rules on sewage treatment if it does not act to rectify the situation.

The case was brought by the EU Commission over Ireland's failure to treat and collecting sewage without posing any risk to human health and the environment in over 52 Irish wastewater treatment schemes.'[11]

In the '*Urban Waste Water Treatment report for 2022'*, the EPA said the following:

'over half of Ireland's wastewater discharges are not meeting EU standards to protect the environment.'[12]

The report continues to say that,

'*55% of Ireland's urban wastewater was produced in the 15 areas that failed EU standards, and that many of these areas "need new treatment infrastructure'*.[13]

According to the EPA water status maps, Aughinish Island is described as follows:

'Waterbodies that are 'At Risk' [Red Zones on map below] of not meeting their Water Framework Directive objectives. For these waterbodies an evidence-based process was undertaken to identify the significant pressures; once a pressure is designated as 'significant', measures and accompanying resources are needed to mitigate the impact(s) from this pressure. These 'At Risk' waterbodies require not only implementation of the existing measures described in the various regulations,[…] but also in many instances more targeted supplementary measures'.[14]

[8] https://www.waternewseurope.com/ireland-to-court-for-failures-water-framework-directive/

[9] https://ireland.representation.ec.europa.eu/news-and-events/news/european-commission-refers-ireland-court-justice-european-union-over-unsafe-drinking-water-2021-11-12_en

[10] Idem

[11] https://greennews.ie/ireland-ecj-wastewater-failures/

[12] https://www.rte.ie/news/ireland/2023/1026/1413015-epa-report-latest/#:~:text=Ireland's%20environmental%20watchdog%20has%20warned,lack%20of%20water%20treatment%20plants.

[13] Idem

[14] https://gis.epa.ie/EPAMaps/Water

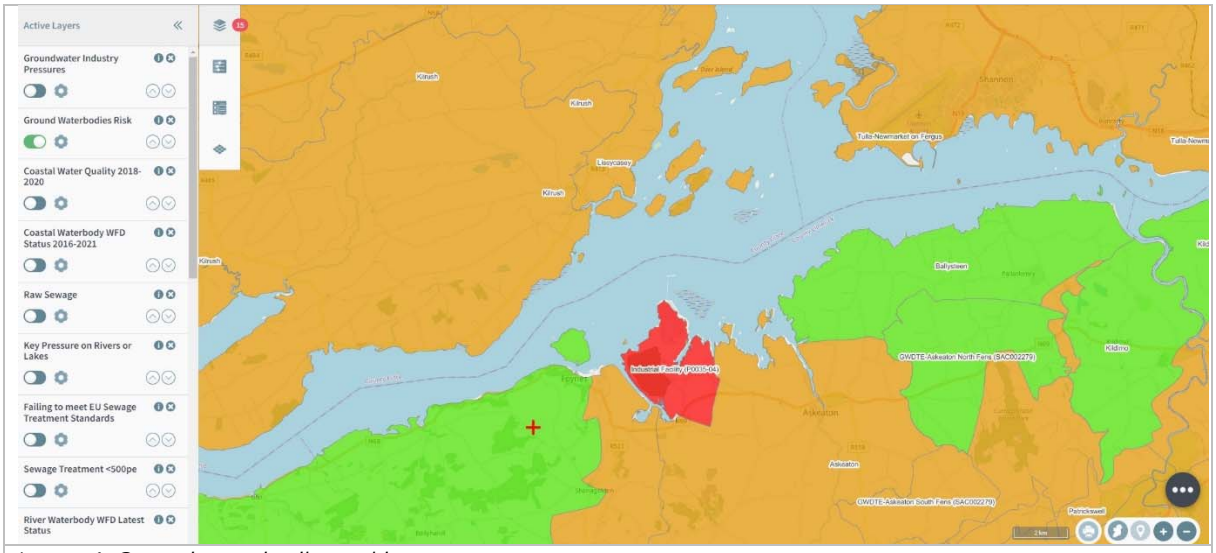


Image 1: Ground waterbodies at risk
Source: https://gis.epa.ie/EPAMaps/Water
dated 20.12.23

'*This table contains all the River Waterbody Status results recorded in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003). The regulation objectives include the attainment of good status in waterbodies that are of lesser status at present and retaining good status or better where such status exists.*'[15]

Image 2: River Waterbody WFD Latest Status
Source: https://gis.epa.ie/EPAMaps/Water
dated 20.12.23

According to the EPA catchment map above, the majority of the rivers and streams leading into the Shannon Estuary, at least in the Inner Shannon Estuary are of moderate or poor status. Notably Irish Water, Local Authorities, all responsible Departments and the EPA are failing to achieve adequate, if any, wastewater treatment for Limerick City, Kilrush, Glynn and Foynes, all of which are in close proximity to the Dredging and Dumping at Sea application site. These pressures must be taken into account in the cumulative impacts during the decision-making process. Again, all these rivers and coastal waters are to '*reach at least good status by 2027 at the latest*' under the Water Framework Directive 2000/60/EC. This will not be achieved when toxic dumping licenses are issued for an unsustainable economic system.

[15] https://gis.epa.ie/EPAMaps/Water

This is clearly demonstrated by the following example, the Freshwater Pearl Mussel.

> '*one of the world's most critically endangered creatures, for which Ireland was considered one of the last remaining European strongholds*'.[16]

The Irish State needs to take responsibility for the wellbeing of ecosystems at a global level. In the 1980's there were 5,000 in the River Nore, Co. Laois, in the 2006 there were only 500 left, and this is how the Irish State deals with it;

> *'In 2009, detailed management plans for mussels in Special Areas of Conservation were drafted but never signed off by the minister of the day, and are now hopelessly outdated. In 2020, the National Parks and Wildlife Service commissioned a review of the overall status of the species across Ireland, with recommendations for immediate action. It has yet to be even published.'*[17]

3.3 Ireland's consistent failure to protect drinking water

In 2007, the European Commission sent Ireland a final written warning for

> *'failing to comply fully with a 2002 European Court of Justice (ECJ) ruling requiring drinking water supplies to be kept free of E.coli bacteria'.*[18]

It also sent Ireland a similar warning for

> *'failing to comply with a 2005 ECJ ruling requiring greater controls on polluting discharges to surface water by local authorities'.*[19]

The Commission also referred Ireland to the ECJ for

> *'failing to give adequate rights to citizens to legally challenge decisions in cases involving environmental impact assessments and integrated pollution prevention and control'.*[20]

In November 2021, the European Commission finally referred Ireland to the Court of Justice of the European Union over unsafe drinking water and the failure to comply with the requirements of the Drinking Water Directive (Directive 98/83/EC). Member States must ensure that water intended for human consumption is clean and does not pose a potential danger to human health. In the case of Ireland the levels of the chemical substance trihalomethanes (THMs) in drinking water are exceeding the parametric value established in the Drinking Water Directive.

> *'Trihalomethanes (THMs) are the result of a reaction between the chlorine used for disinfecting tap water and natural organic matter in the water. At elevated levels, THMs have been associated with negative health effects such as cancer and adverse reproductive outcomes*'.[21]

And this year alone, nearly 7,000 Limerick residents have been impacted by a boil water notice since last May.[22]

[16] https://www.irishtimes.com/environment/2023/12/16/endangered-freshwater-pearl-mussels-in-ireland-have-full-eu-protection-but-its-done-them-no-good/
[17] idem
[18] https://ec.europa.eu/commission/presscorner/detail/en/IP_07_391
[19] idem
[20] Idem
[21] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1257669/#:~:text=Trihalomethanes%20(THMs)%20are%20the%20result,cancer%20and%20adverse%20reproductive%20outcomes
[22] https://www.independent.ie/regionals/limerick/news/nearly-7000-limerick-people-impacted-by-boil-water-notice-that-has-been-in-place-since-may/a2126057976.html

3.4 Radioactive waste

In November 2021

> *'The European Commission decided to send a reasoned opinion to Ireland concerning a national programme for radioactive waste management it adopted which is not entirely compliant with the Spent Fuel and Radioactive Waste Directive (Council Directive 2011/70/Euratom). It requires Member States to draw up and implement national programmes for the management of all spent fuel and radioactive waste generated on their territory, from generation to disposal. The national programme notified by Ireland was found to be non-compliant with certain requirements of the Directive. Ireland now has two months to address the shortcomings identified by the Commission. In the absence of a satisfactory response, the European Commission may decide to refer the case to the Court of Justice of the European Union.'*[23]

From the AAL application NIS report,

> *5.1.3.3 Marine Sediment*
> *A summary of the analysis of each set of results is provided in the subsections hereunder. The results are consistent with those carried out by the same company, in 2016, that were provided in the NIS that accompanied the original application (MWP Document No. 17076-6002). An extract from which is provided hereunder, in that, bed material at the dredge sites was then, and is now, considered to be clean and therefore suitable for dumping at sea. "Marine sediment analysis determined that the sediments within the proposal site do not comprise a radiological hazard. Results indicate that disturbance of these sediments as a result of the proposed dredge campaign will not result in any radiological hazard to the receiving environment."*

The quote above is from the current NIS report and refers to 2016 radioactive testing of the sediments. Were current radioactivity levels tested for this new application? And has the Irish State complied with the Spent Fuel and Radioactive Waste Directive (Council Directive 2011/70/Euratom)?

3.5 Environmental Quality Standard (EQS)

In 2008, an Environmental Quality Standard (EQS) for sediment was required to be published by each EU state under the Water Framework Directive.
The *Directive 2008/105/EC – Environmental Quality Standards in the Field of Water Quality Policy – Amended: 2013* states that:

> *'16:*
> *Furthermore, Member States should be able to establish EQS for sediment and/or biota at national level and apply those EQS instead of the EQS for water set out in this Directive. Such EQS should be established through a transparent procedure involving notifications to the Commission and other Member States so as to ensure a level of protection equivalent to the EQS for water set up at Community level. The Commission should summarise these notifications in its reports on the implementation of Directive 2000/60/EC. Moreover, sediment and biota remain important matrices for the monitoring of certain substances with significant accumulation potential. In order to assess long-term impacts of anthropogenic activity and trends, Member States should take measures, subject to Article 4 of Directive 2000/60/EC, with the aim of ensuring that existing levels of contamination in biota and sediments will not significantly increase'.*[24]

[23] https://ireland.representation.ec.europa.eu/news-and-events/news/european-commission-refers-ireland-court-justice-european-union-over-unsafe-drinking-water-2021-11-12_en
[24] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02008L0105-20130913

> *'Article 3.6*
> *Member States shall arrange for the long-term trend analysis of concentrations of those priority substances listed in Part A of Annex I that tend to accumulate in sediment and/or biota, giving particular consideration to the substances numbered 2, 5, 6, 7, 12, 15, 16, 17, 18, 20, 21, 26, 28, 30, 34, 35, 36, 37, 43 and 44 listed in Part A of Annex I, on the basis of the monitoring of surface water status carried out in accordance with Article 8 of Directive 2000/60/EC. Member States shall take measures aimed at ensuring, subject to Article 4 of Directive 2000/60/EC, that such concentrations do not significantly increase in sediment and/or relevant biota'*.[25]
>
> 'Among these priority substances, certain substances have been identified as priority, hazardous substances for which member states should implement necessary measures with the aim of ceasing or phasing out emissions, discharges and losses.'[26]

Having checked the list in the *Annex 1 of Directive 2008/105/EC*, at least twelve substances that are listed in the AAL application Sediment Analysis are listed as priority substances whose emissions, discharges and losses should be ceased or phased out.
The AAL sediment analysis shows a presence of:

- Anthracene
- Benzo[a]pyrene
- Cadmium
- Fluoranthene
- Indeno[1,2,3-cd]pyrene
- Lead
- Naphthalene
- Mercury
- alpha-Hexachlorcyclohexane
- beta-Hexachlorcyclohexane
- gamma-Hexachlorcyclohexane.
- Hexachlorobenzene.

According to *Ireland's National Water Framework Directive Monitoring Programme 2019-2021*[27] published by the EPA, page 23 mentioned that there are only eight substances on the priority substances list being monitored, and two still need to be commenced.
The EU Directive 2008/105/EC list of priority substances contains twenty substances, and without monitoring of all these priority substances, no licenses can be issued.

According to the Guidance document *'No. 27 Technical Guidance for Deriving Environmental Quality Standards*':

> *'Evidence of high toxicity to aquatic organisms or sediment-dwelling organism or evidence of accumulation in sediments would constitute a sediment EQS'*.[28]

and

> *'A biota EQS would be required if there is a risk of secondary poisoning of predators from eating contaminated prey or a risk to humans from eating fishery products'*.[29]

We believe that sediments containing the priority substances mentioned above cannot be ploughed or spread or that a Dumping at Sea licence can be issued. Furthermore, the EPA needs to monitor and cease the emission of all priority substances immediately to comply with the WFD.

[25] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02008L0105-20130913
[26] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02008L0105-20130913
[27] https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/irelands-national-water-framework-directive-monitoring-programme-2019-2021.php
[28] https://circabc.europa.eu/sd/a/ba6810cd-e611-4f72-9902-f0d8867a2a6b/Guidance%20No%2027%20-%20Deriving%20Environmental%20Quality%20Standards%20-%20version%202018.pdf
[29] Idem

We also believe that more monitoring stations need to be implemented in the Shannon Estuary, in particular around Aughinish Island and the port of Foynes to monitor the priority substances as listed under the EU Directive. Given the presence of the priority substances in the sediment, which needs to be ceased or phased out, the contaminated dredged sediment needs to be brought to land and contained and monitored appropriately to avoid further damage to aquatic life.

In the week of the 17th November 2023, the EPA published the *Local Authority Environmental Enforcement – Performance Report for 2022*.

> *'While the scale of environmental enforcement work carried out by local authorities is significant, in many areas it is not delivering the necessary environmental outcomes such as improved water and air quality and waste segregation'*.[30]

According to the EPA,

> *'The number of estuaries and coastal water bodies in satisfactory condition has decreased by almost 16% and 10% respectively'*.[31]

The agency blames agriculture as the '*most prevalent significant pressure causing water quality impacts*'[32] in relation to high nutrient levels in water bodies.

3.6 Significant industrial pressures

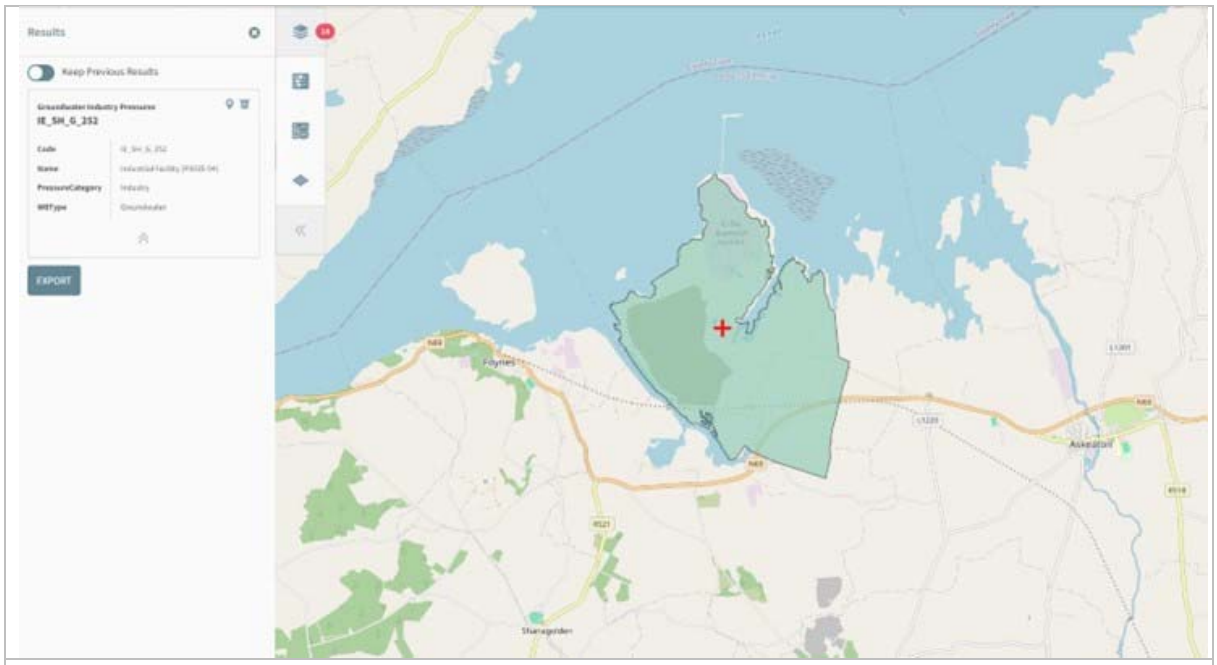


Image 3: Groundwater Industrial Pressure
Source: https://gis.epa.ie/EPAMaps/Water
dated 20.12.23

> *'Significant pressures have been identified for waterbodies that are At Risk of not meeting their water quality objectives under the Water Framework Directive. While there are a multitude of pressures in every waterbody, the significant pressures are those pressures which need to be addressed in order to improve water quality'*.[33]

Interestingly the EPA focuses on run off from agriculture and dwelling and on private water supplies. While it is noted that the EPA *Catchment map for Significant Pressure – IEL Facilities*,

[30] https://thewaterforum.ie/epa-local-authority-environmental-enforcement-performance-report-for-2022/
[31] Idem
[32] Idem
[33] https://gis.epa.ie/EPAMaps/Water

shows no mention of adjacent industries such as: Irish Cement at Mungret, meat processing plant in Rathkeale nor the baby formula factory in Askeaton.

The cumulative effects in the rivers and estuary from the proposed dredging and dumping at sea must be taken into account together with AAL's other activities, those of the industries mentioned above, raw sewage, agriculture, chemicals, pesticides, forestry, other industries and mining.

In order to improve water quality and ecosystem health, derogations for polluting industry need to be removed immediately.

Furthermore, what plan has been put in place by the EPA and AAL to improve the water quality around Aughinish Island and in the Shannon Estuary? Is this plan compatible with the dredging and Dumping at Sea licence?

4. Protection of Life

4.1 Worrying trends

In April 2023, the European Environment Agency published their '*State of Nature in Europe; A Health Check*' report on the status of nature in the Europe and made the following statement that:

> '*Only 27 % of protected species indicate a good conservation status, whilst 63 % have a poor or bad status.'*
>
> And
> *'Europe's nature is experiencing a serious and continuing decline. The challenge to protect it is urgent, and significant additional efforts are needed to reverse the current trend'.*[34]

The EEA also highlighted that,

> '*Most protected species in Europe have a poor or bad conservation status as a result of ongoing pressures from changes in land and sea, overexploitation and unsustainable management practices. Pollution of air, water and soil also has an impact on most species.'*
>
> And continues:
> '*more effective implementation of environmental legislation (including the EU Habitats and Birds Directives) and a transition to sustainable practices in socio-economic sectors are needed to lessen the severe impact on Europe's nature'.*[35]

[34] https://www.eea.europa.eu/en/topics/at-a-glance/nature/state-of-nature-in-europe-a-health-check
[35] https://www.eea.europa.eu/en/topics/in-depth/nature-protection-and-restoration/species-protection-and-conservation?activeAccordion=fa9bdf76-5165-4f3a-a940-e059381a7972

Trends in conservation status of habitats

Figure 5a: Conservation status trends of habitats with unfavourable (i.e. not good) or unknown status at EU level

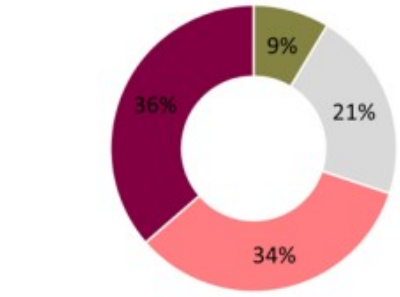
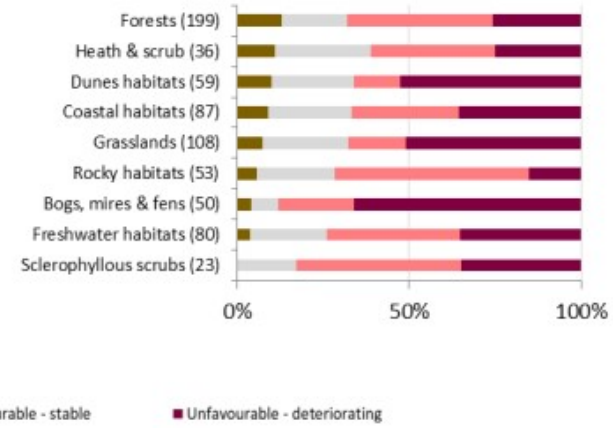


Figure 5b: Conservation status trends of habitats with unfavourable (i.e. not good) or unknown status per habitat group at EU level



Note: Conservation status trends are based on EU habitat assessments (698).

Note: The number of assessments is indicated in parentheses. The total number of assessments is 698.

Image 4:
Source: Report on the status and trends in 2013 - 2018 of species and habitat types protected by the Birds and Habitats Directives

Figure 4a: Conservation status of habitats at EU level

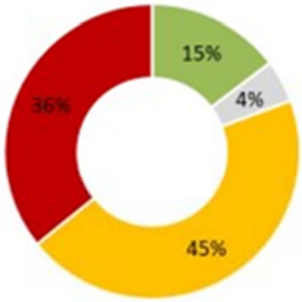
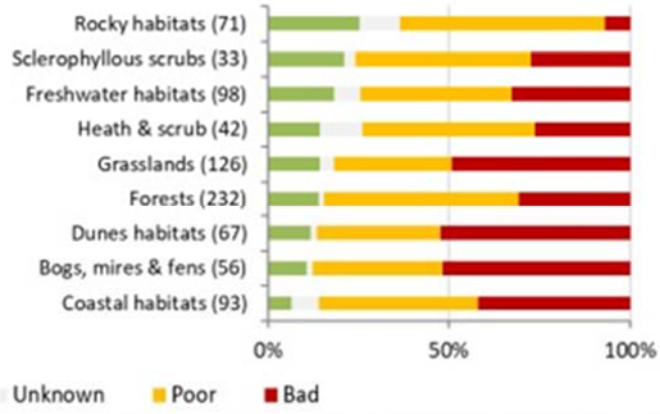


Figure 4b: Conservation status per habitat group at EU level



Note: Statistics based on number of EU habitat assessments (818).

Note: The number of assessments per group is indicated in parentheses. Marine habitats are part of the 'coastal habitats' group. The total number of assessments is 818.

Image 5:
Source: Report on the status and trends in 2013 - 2018 of species and habitat types protected by the Birds and Habitats Directives

Conservation status of species

Figure 6a: Conservation status of species at EU level

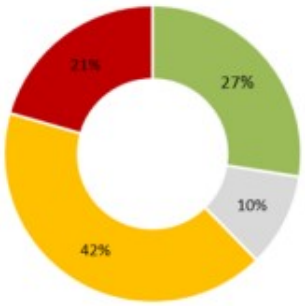
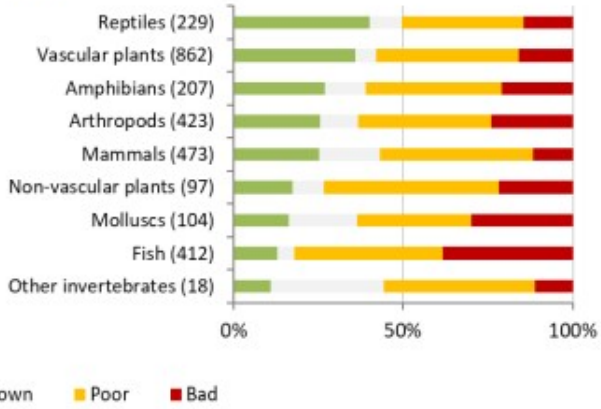


Figure 6b: Conservation status per species group at EU level



Note: Statistics based on number of EU species assessments (2 825).

Note: The number of assessments per group is indicated in parentheses. The total number of assessments is 2 825.

Image 6:
Source: Report on the status and trends in 2013 - 2018 of species and habitat types protected by the Birds and Habitats Directives

Figure 7a: Conservation status trends of species with unfavourable (i.e. not-good) or unknown status at EU level

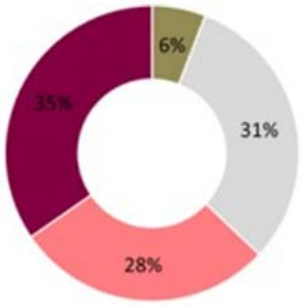
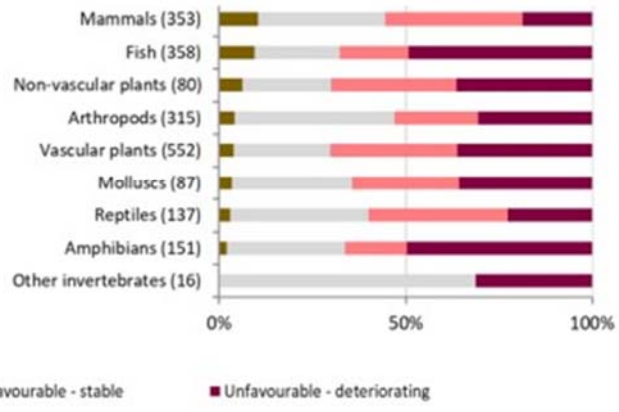


Figure 7b: Conservation status trends of species with unfavourable (i.e. not-good) or unknown status at EU level, per group



Note: Conservation status trends are based on EU species assessments (2 049).

Note: The number of assessments is indicated in parentheses. The total number of assessments is 2 049.

Image 7:
Source: Report on the status and trends in 2013 - 2018 of species and habitat types protected by the Birds and Habitats Directives

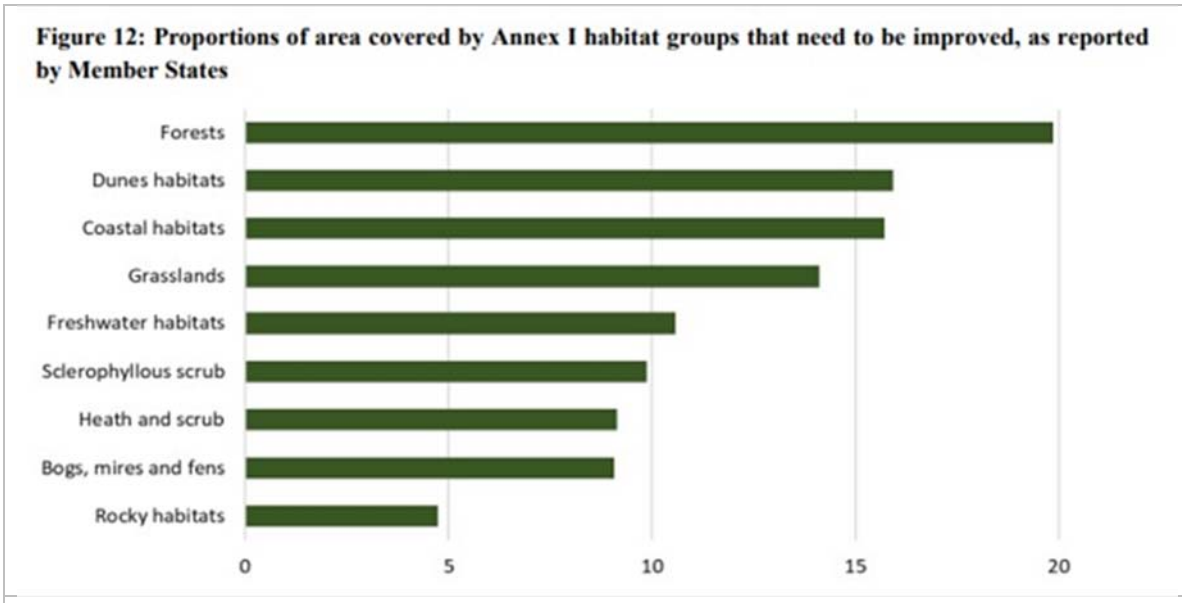


Image 8:
Source: Report on the status and trends in 2013 - 2018 of species and habitat types protected by the Birds and Habitats Directives

NOTE: coast habitats are in the top three Annex 1 habitat groups listed as needing improvement.

The results are published, together with the reporting on bird species under the Birds Directive in a '*State of Nature in the European Union'* report. The last report, published in 2020, presents the results of the 3rd reporting cycle for the period 2013–2018.

> 'According to the latest report, only a quarter (27%) of the species have a good conservation status at EU level. This is an increase from 23% in 2015. Most species (63%) continue to have a poor or bad status. The situation is worse for habitats - just 15% having a good status. The vast majority (81%) are in a poor or bad status'.[36]

In Ireland the situation is even worse. Instead of 36% of habitats in decline it is 46%. And a whopping 85% if habitats are in a state that is *Unfavourable- Inadequate/Bad*.

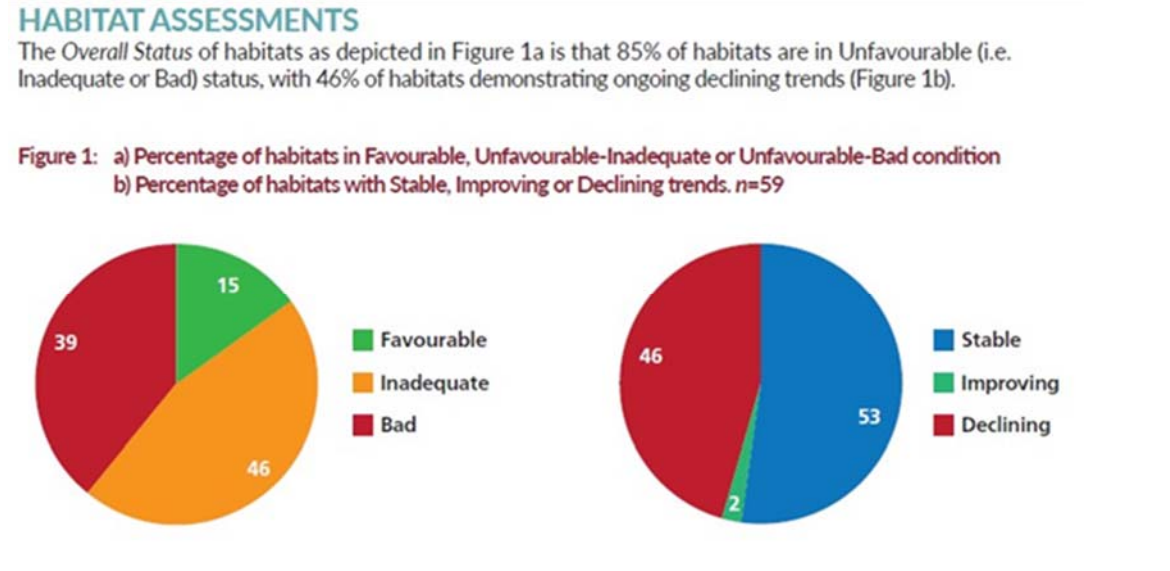


Image 9:
Source: The Status of EU Protected Habitats and Species in Ireland, 2019

[36] https://environment.ec.europa.eu/topics/nature-and-biodiversity/habitats-directive_en

More detailed information from the '*The Status of EU Protected Habitats and Species in Ireland*' 2019, shows that Estuaries, Tidal mudflats and sand flats and lagoons are inadequate, deteriorating, bad.

1130 Estuaries

'The Overall Status of the habitat is Inadequate and deteriorating. This status is the same as the 2013 assessment; however the trend has changed, due to more accurate data, from improving to declining. This decline is considered to have been on-going since before the last assessment.'

1140 Tidal mudflats and sandflats

'The Overall status of the habitat is Inadequate and deteriorating, the change in trend from improving to deteriorating due to a genuine decline in the habitat since 2013. This was caused partly by pollution from agricultural, forestry and wastewater sources as well as impacts associated with marine aquaculture, particularly the Pacific oyster (Magallana gigas).'

1150 lagoons

'Several high-ranking pressures were identified acting on this habitat: eutrophication, modification of hydrological flow, and drainage. Other pressures noted include erosion and silting up, accumulation of seaweed, and sedimentation from peat related to turf cutting and/or forestry. The Overall Status for Lagoons is assessed as Bad, unchanged since the 2013 assessment. However, the overall trend has changed from stable to deteriorating, a genuine decline since 2013.'

1160 Large shallow inlets and bays

'A number of rare or unusual species also occur, including the rare anemones Edwardsiadelapiae and Pachycerianthus multiplicatus and sensitive subtidal species such as Neopentadactyla mixta, Sabella pavonina, Virgularia mirabilis and Limaria hians. Pressures on the habitat include nutrient enrichment, dredging and invasive alien species. Overall Status is assessed as Bad and deteriorating, a genuine decline since the 2013 assessment of inadequate and improving and is based on more detailed information.'

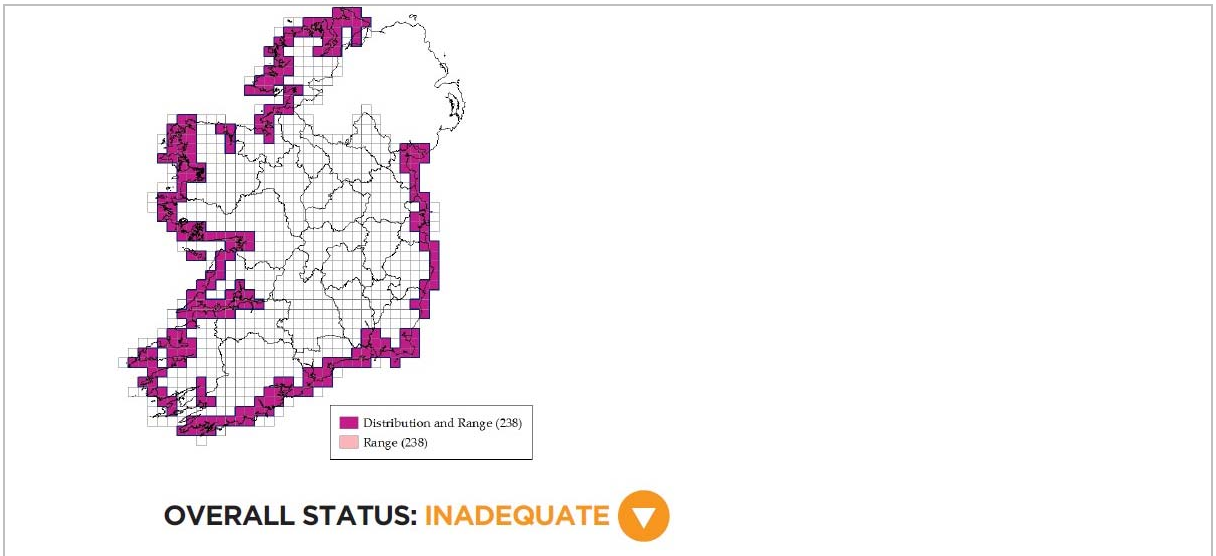


Image 10: 1140 Tidal mudflats and sandflats status and location
Source: The status of EU Protected Habitats and Species in Ireland, 2019

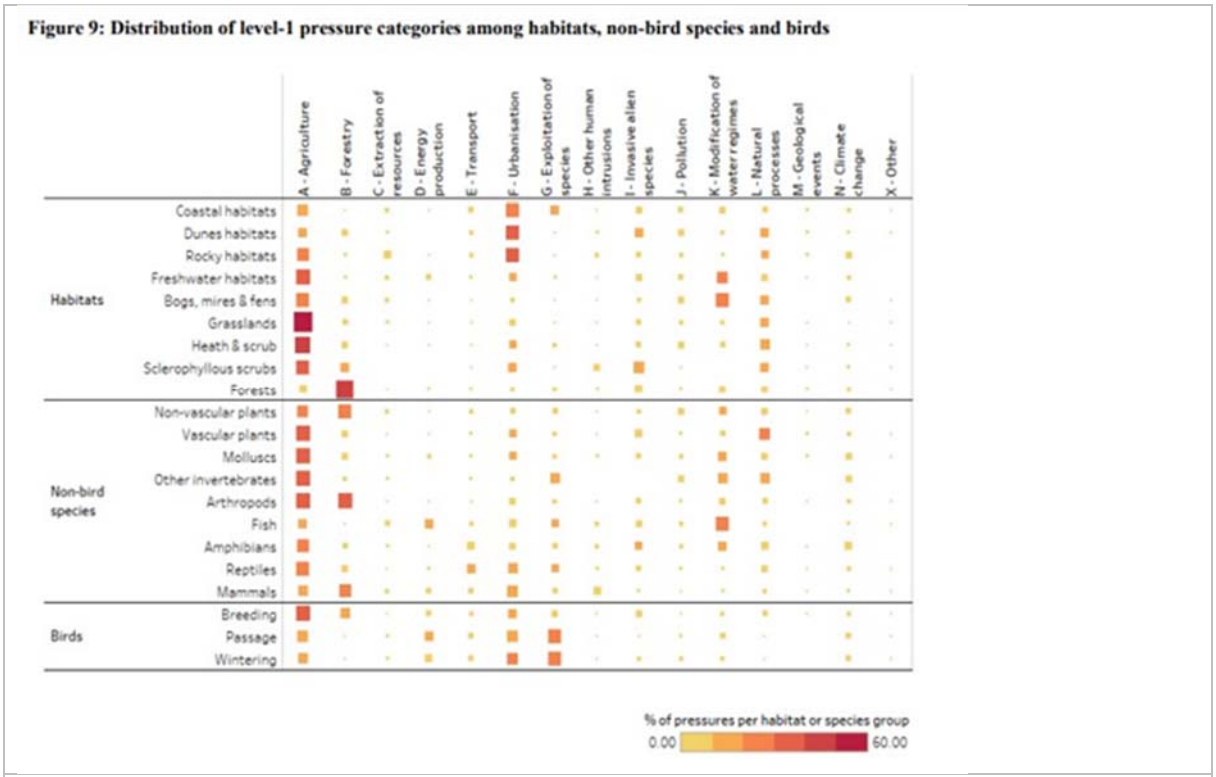


Image 11:
Source: Report on the status and trends in 2013 - 2018 of species and habitat types protected by the Birds and Habitats Directives

Where is the industry on this analysis?
Where do activities such as those carried about by AAL fit into pollution pressure on habitats and species? These must be included, without the weighting of derogations or emission offsets. There must be a level playing field between citizens and industry, because all humans and ecosystems benefit from improved environmental conditions.

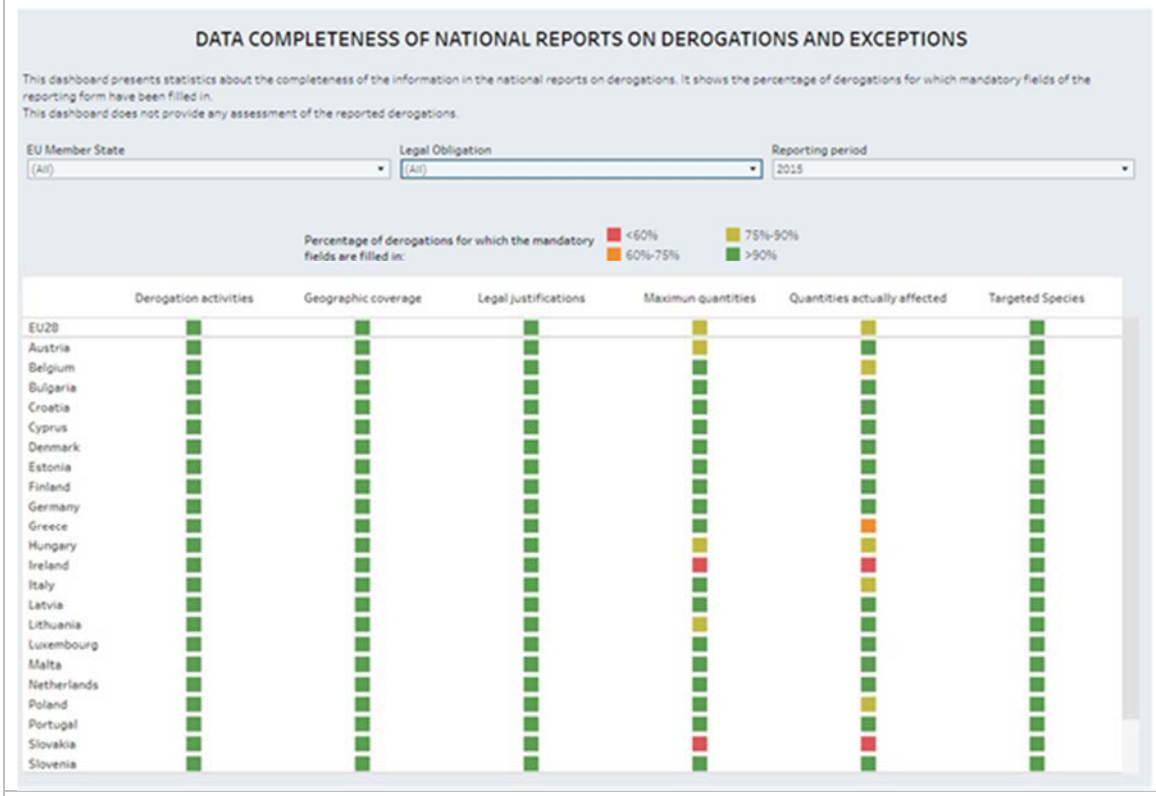


Image 12:

Even the reporting on derogations and exceptions from the EU Habitats Directive by the Irish State is very poorly carried out. Not only failing to reach the minimum of 60% completeness in 2021, the Irish State only submitted a messily 0.6% and 0.0% of the geographical coverage area and the Maximum quantities, respectively, required to be reported on. This trend is not recent. In 2015 the Irish State also stands out above all other EU states bar one. It not only failed to reach the minimum of 60% completeness but only submitted a very low 6.4% and 10.7% of the Geographical Coverage and the Maximum Quantities required to be reported on.

These are damning records showing the failures of environmental protection across the EU. Note that there are also vast information gaps, this would likely mean that the percentages of unfavourable/ poor/ declining habitats and species is even worse than what has been recorded. However, there are vast amounts of recording and reporting done. These all seem to take years if not decades.
Is this all pointless if it facilitates further delay in action to stop the trends of destruction which are being recorded? Are the policies and environmental and non–environmental legislation taking these reports into account? History seems to show otherwise. Are they put in place fast enough to prevent deterioration levels leading to extinction of species like the Freshwater Pearl Mussel? History will tell, in the not-so-distant future. Every minute that is spent recording and reporting could be spent on the ground, making sure that species are given a chance to survive. Every development, especially those of large-scale implications must be decided up on based on its levels of necessity to the survival of humanity and the burden it will have on the precious ecosystems that we still have and that we can still save and repair.

5. Legislation

5.1 COP15 Biodiversity

In December 2022 the Irish State signed up to the following goals;[37]

- Effective conservation of at least 30% of the world's lands and waters.
- Restoration completed or underway on at least 30% of degraded terrestrial and aquatic ecosystems.
- Reduce to near zero the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity.
- Reduce by half both excess nutrients and the overall risk posed by pesticides and highly hazardous chemicals.
- Progressively phase out or reform by 2030 subsidies that harm biodiversity by at least US$500 billion per year, while scaling up positive incentives for biodiversity's conservation and sustainable use.

5.2 Marine Protected Areas

In response to the *EU Biodiversity Strategy to 2030*, the Irish State published the '*Marine Strategy Framework Directive 2008/56/EC - Article 17 update to Ireland's Marine Strategy Part 3: Programme of Measures (Article 13)*' in February 2023

- update guidance on reducing underwater noise pollution to protect marine mammals
- develop and expand Ireland's Marine Protected Areas (MPAs) to cover 30% of our marine area by 2030, including enacting of the Marine Protected Areas Bill in 2023
- develop Nature-Based Solutions in coastal and marine systems, to protect biodiversity, improve resilience to climate change and reduce the impact of pollution

[37] https://www.davy.ie/market-and-insights/insights/capital-markets/horizons/cop15--landmark-global-biodiversity-agreement---key-takeaways-for-business.html

'As well as national measures the programme includes co-operative measures with other EU Member States and the UK to tackle pollution, [...], entering our seas and to protect our valuable ecosystems'.[38]

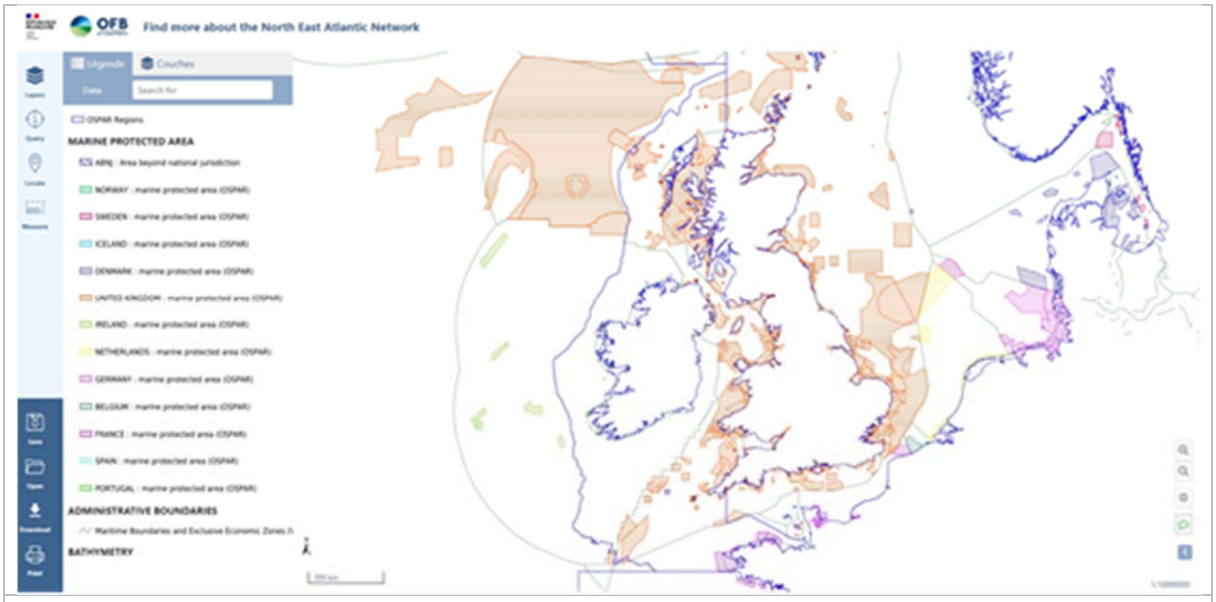


Image 13:
Source: OFB/ OSPAR MPA maps

Natura 2000 sites cover 18% of land and 10% of marine waters in the EU.[39] As can be seen in the map above of Marine Protected Areas, the Irish State is again seriously lagging in protection of the marine environment. The Irish State has currently designated only 8.1% of their marine waters as MPAs (in form of SACs and SPAs)[40]

As Ireland has a proportionally large marine area within the EU, the State has a larger responsibility to protect marine habitats. According to the AAL application, Benthic Report prepared by MWP, the sediment will in fact be washed out to sea within one year. Therefore, the chemicals within the sediment will also be washed out to sea and the Dumping at Sea licenses applied for will only add to the pressures of transitional, estuary and marine habitats which should already have protection but do not. The assessment of the application must take into account potentials impacts with regard to the Marine Protected Areas Act 2023.

5.3 European Green Deal

'"This is an important aspect of the European green deal's zero pollution ambition, aiming for water pollution to be reduced to levels no longer considered harmful to human health and natural ecosystems," the commission noted.' [41]

5.4 Ireland facing European Court for failures to protect habitats

In June 2023, after decades of delays and failures the long-running case was brought forward by the European Commission in relation to implementation of the EU Habitats Directive.

'the European Court of Justice ruled that the Republic of Ireland broke nature laws by failing to protect hundreds of sites. 'The Court found that the Irish government had failed to designate Special Areas of Conservation for 217 of the 423 sites across the

[38] https://www.gov.ie/en/press-release/b47fd-new-measures-to-tackle-pollution-biodiversity-loss-and-climate-impacts-on-irelands-seas/#:~:text=The%20Programme%20incorporates%20specific%20measures,and%20increased%20spatial%20protection%20measures
[39] https://www.eea.europa.eu/en/topics/at-a-glance/nature/state-of-nature-in-europe-a-health-check
[40] https://iwt.ie/what-we-do/campaigns/marine-protected-areas/#:~:text=Ireland%20has%20currently%20designated%20only,the%20end%20of%20the%20year.
[41] https://www.irishtimes.com/environment/2023/01/26/european-commission-brings-ireland-to-court-over-eu-water-directive-failure/

country' and that 'the government also neglected to set 'site-specific detailed conservation objectives' at 140 sites.'' [42]

5.5 Proposed Natural Heritage Areas

Proposed Natural Heritage Areas (pNHAs) are:

'…sites are of significance for wildlife and habitats.

Prior to statutory designation, pNHAs are subject to limited protection, in the form of:

- *Recognition of the ecological value of pNHAs by Planning and Licencing Authorities.'*

pNHAs have not been assessed in the NIS report for the AAL dredging and Dumping at Sea application. However, the EPA must recognise the ecological value of the pNHA when assessing the application and therefore we believe that potential damage to these habitats has not been assessed so a license cannot be issued.

The following pNHAs are a relevant:

In very close proximity of the proposed dredging (and dumping) sites is the *pNHA 00435- Inner Shannon Estuary, South Shore*.

Across the estuary but still under potential threat from proposed disturbances is the *pNHA 002048 – Fergus Estuary and Inner Shannon North Shore*. Near the proposed dumping site there is *pNHA 001436 – Sturamus Island* and *pNHA Cahiracon Wood*.

Four lagoons are listed for this SAC (Oliver, 2007). The table below gives the conservation status assessment of each lagoon as outlined in that report. See map in Appendix 1 and Appendix 2 for accounts of each site (from Oliver, 2007).

Code[1]	Name	County	Conservation Assessment
IL031	Quayfield and Poulaweala Loughs	Limerick	Unfavourable inadequate
IL032	Shannon Airport Lagoon	Clare	Unfavourable- bad
IL033	Scattery Lagoon	Clare	Unfavourable- inadequate
IL034	Cloonconeen Pool	Clare	Unfavourable- inadequate

[1] Codes are those used in Oliver, 2007.

Image 14:
Source: NPWS - Lower River Shannon SAC (site code 2165) Conservation objectives supporting document – Lagoons 2012

'Lagoons support unique assemblages of flora and fauna, particularly invertebrates. In Ireland, coastal lagoons are considered to be in bad conservation status due to issues such as drainage and water pollution. (NPWS, 2008).' [43]

The 2012 *'Conservation objectives supporting document - Lagoons'* report finds that the status of all lagoons including these in the Lower River Shannon SAC remain 'unfavourable', with three '*Inadequate'* and one '*Bad'*.

Has an assessment of the impacts of application activities on the Robertstown River, downstream from the proposed dredging site been made?

Have the cumulative impacts of AAL together with other pressures such as water extraction, forestry, agriculture, mining other industry been investigated by the EPA? Despite delays by government bodies to protect these pNHAs, one would argue that knowingly allowing further deterioration of these sites will never lead to an improvement of their status or a repair to their former glory.

[42] https://www.bbc.com/news/articles/cy975d7wle9o

[43] https://www.npws.ie/sites/default/files/publications/pdf/002165_Lower%20River%20Shannon%20SAC%20Lagoons%20Supporting%20Doc_V1.pdf

Current environmental legislation is clearly not functioning in its goal of protecting and repairing damaged habitat and preventing species decline and extinction. It also is clear that socio-economics bias of policy and legislation is unsustainable. This bias putting economic gain ahead of the protection of our life supporting ecosystems will ultimately severely impair the possibility of the human species' survival on this planet.

5.6 Citizens' Assembly on Biodiversity Loss

The '*Final Report of the Citizens' Assembly on Biodiversity Loss*' April 2023:

> '*proposes a series of changes to the Constitution to ensure people have a right to a clean, healthy, and safe environment. In addition, the Assembly recommends that nature be provided with protections within the constitution to allow it to continue to provide the necessities of life including food, clean freshwater and air, as well as providing a clean and healthy environment for wellbeing now and in the future. Such recommendations follow a growing international trend highlighting the necessity to protect nature in order to protect humans*.' [44]

5.7 Rights of Nature

Rights of Nature is:

> '*the recognition that our ecosystems – including trees, oceans, animals, mountains – have rights just as human beings have rights. Rights of Nature is about balancing what is good for human beings against what is good for other species, what is good for the planet as a world. It is the holistic recognition that all life, all ecosystems on our planet are deeply intertwined. Rather than treating nature as property under the law, rights of nature acknowledges that nature in all its life forms has the right to exist, persist, maintain and regenerate its vital cycles. And we – the people – have the legal authority and responsibility to enforce these rights on behalf of ecosystems. The ecosystem itself can be named as the injured party, with its own legal standing rights, in cases alleging rights violations. For indigenous cultures around the world, recognizing rights of nature is consistent with their traditions of living in harmony with nature. All life, including human life, are deeply connected. Decisions and values are based on what is good for the whole'*.[45]

The Department of the Environment, Climate and Communications and the EPA could and should play a huge part in protecting and celebrating the importance of our waterways, canals, rivers, transitional- and coastal waters and all the beautiful species which try to survive in them.

5.8 Ecocide

According to the Independent Expert Panel for the Legal Definition of Ecocide:

> '*Ecocide' means unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment being caused by those acts*.' [46]

Currently, there is a big push to amend the Rome Statue of the International Criminal Court (ICC), which currently lists the following crimes: Genocide, Crimes Against Humanity, War Crimes and Crimes of Aggression, to include Ecocide as the fifth international crime.

As of 26th October 2022, The Stop Ecocide Foundation EU Crime Directive Position Paper, submitted to EU agencies, has just been vindicated by the vote of the EU's environment (ENVI) committee on its proposals vis-a-vis the revision of the EU Directive. The committee has proposed inclusion of a standalone article in the Directive setting out an offence of ecocide to cover "severe and either widespread or long-term damage to the environment".

[44] https://citizensassembly.ie/report-of-the-citizens-assembly-on-biodiversity-loss-report-launches/
[45] https://www.garn.org/rights-of-nature/
[46] https://www.stopecocide.earth/what-is-ecocide

> *'While the recognition of the crime of ecocide is currently being discussed in several national parliaments around the world and in the EU, the EU should seize this issue to remain a world leader in environmental protection legislation and to ensure harmonised definition and sanctions ex ante, and not ex post.'*[47]

The latest development in relation to '*Ecocide'* is that *'The European Union has become the first international body to criminalise wide-scale environmental damage 'comparable to ecocide''*.[48]

> *'The revised EU law [Environmental Crime Directive] specifies which kinds of environmental activities are covered. These include water abstraction, ship recycling and pollution, the introduction and spread of invasive alien species, and ozone destruction.'* [49]

6 Effect on Aquatic Life - Chemicals

6.1 Red Mud Impacts

Given that it is likely that the sediment is contaminated through spillages and leakage from the off loading, loading and unlined BRDA, we think the EPA must assess the effects of red mud on aquatic life in relation to the application for dredging and dumping at sea and cannot issue a license without having ruled out any potential contamination.

> *'Halsband and Halsband [10] studied the physiological effect of red mud on marine organisms. It was observed in North sea that fish was getting affected faster as compared to algae. Paffenhoefer [11] also studied the effect of red mud on sea organisms. It was noticed that iron hydroxide part of red mud was particularly responsible for growth inhibiting effect on phytoplankton. Red mud was found harmful to fish or shell fish, will similarly affect other organisms also. This kind of sea pollution study is categorized under four subheads, 1. Killing of fish or shellfish at any stage in their life cycle, i.e., as larvae, juvenile or adults; 2. Interference in biological process such as growth physiology, breeding, etc. 3. Contaminations with persistent toxic substances so that fish and shell fish become unsafe to eat; and 4. Tainting so that fish and shell fish were rendered unpalatable and temporarily unsalable. Source 'Characterisation of red mud and its effects on environment due to its traditional methods of disposal.'*[50]

Due to avoidable and unavoidable errors and spillages during unloading of raw bauxite and the loading of alumina for export, we believe that a build-up of both these materials will be present in the sediment of zones A to D in the dredging application. Due to systematic and long-term leakage from the unlined BRDA into the River Shannon it is also believed that high levels of toxicity are present in the sediment in question.

According to the benthic report as submitted, the mud sediment will be washed away within a year therefore it will contaminate habitats towards and possibly beyond the mouth of the Shannon Estuary.

> *'Large quantity of red mud is generated worldwide every year posing a very serious and alarming environmental problem.'*[51]

[47] https://www.stopecocide.earth/s/ECD-Compromise-Amendments_finalversion.docx
[48] https://www.theguardian.com/environment/2023/nov/17/eu-criminalises-environmental-damage-comparable-to-ecocide
[49] idem
[50] https://www.chemijournal.com/archives/?year=2020&vol=8&issue=6&ArticleId=10949&si=false
[51] Idem

> *'Nauke investigated geological aspects of red mud dumping site. In North sea at an experimental site 15000 tonnes of red mud were dumped and after several months it was observed that waste spread to 250 square km. High iron contents were observed at dumping area, grey colour of sand had changed to brown indicating that red mud changed to brown iron hydroxide which was found on the surface of sand grains. It was observed that dumping the red mud into river increased silt content, concentration of the heavy minerals and limited the downstream uses of water.'*[52]

As can be seen from the results below on the characterisation of the sediment to be dredge the brown colour indicates a high iron content.

Test Report ID MAR01828
Issue Version 2
Customer Reference Aughinish Sediments

		Method No	SUB_02*
Client Reference:	SOCOTEC Ref:	Matrix	Visual Description
F1	MAR01828.001	Sediment	Greyish brown clayey SILT
F2	MAR01828.002	Sediment	Greyish brown clayey SILT
F3	MAR01828.003	Sediment	Brown silty CLAY
F4	MAR01828.004	Sediment	Brown silty CLAY

* See Report Notes

Image 15:
Source: AAL application, Appendix B.1.(ii): Characteristics and Composition of the Substance for Disposal.

> *'Sediments act as an important route of (toxic) exposure for aquatic organisms to (non)essential metals. The Canadian interim sediment quality guidelines (ISQGs) can be used to evaluate the degree to which adverse biological effects are likely to occur as a result of exposure of these metals in sediments.'* [53]

In our opinion, Canadian environmental protection standards are low due to the massive scale of the mining and fossil fuel extraction industries operating there. As shown in the table below, the Canadian standards for sediments are better than the 2006 '*Irish Guidelines for the Assessment of Dredge Material for Disposal in Irish Water*' by the Marine Institute.

Table 1 lists the levels of metal content in sediment between Canadian and Irish Standards:

	Canadian Fresh Water (1999) *(mg/kg)*	Canadian Marine/ Estuarine (1999) *(mg/kg)*	IRL (2006) *(mg/kg)*
Arsenic	5.9	7.24	20*
Cadmium	0.6	0.7	0.7
Chromium	37.3	52.3	120
Copper	35.7	18.7	40
Lead	35.0	30.2	60
Mercury	0.17	0.13	0.2
Nickel	-	-	40*
Zinc	123	124	160

** threshold increased in 2018 addendum to the 2006 Guidelines for the Assessment of dredged material in Irish Waters.*

NOTE: the threshold for Nickel was in fact increased by the Irish Marine Institute, well after the implementation of the Directive 2008/105/EC, aiming to reduce/ cease priority substances, which includes Nickel.

[52] https://www.chemijournal.com/archives/?year=2020&vol=8&issue=6&ArticleId=10949&si=false
[53] https://ccme.ca/en/current-activities/canadian-environmental-quality-guidelines

In our opinion, the 2006 *'Irish Guidelines for the Assessment of Dredge Material for Disposal in Irish Water'* are not providing an equivalent level of protection to the 2013 EU Directive on EQS and should therefore be disregarded.

> *'High trace metal concentrations can lead to sediment toxicity and significantly impact benthic organisms survival and growth.'*[54]

Just looking at two of the heavy metals found in the sediment: *'Arsenic'& 'Chromium'.* Arsenic is found to have a *'3 – 10 mg kg-1 range suggested as a potential phytotoxic level.'*[55]

> *'Arsenic is considered to be a significant environmental toxicant. Anthropogenic sources of arsenic are emitted into the air, water, and soil where the pathway to environmental species, ecosystems and humans is more direct.'*[56]

And

> *'Chromium is one of the most prevalent heavy metals in red mud.'*[57]

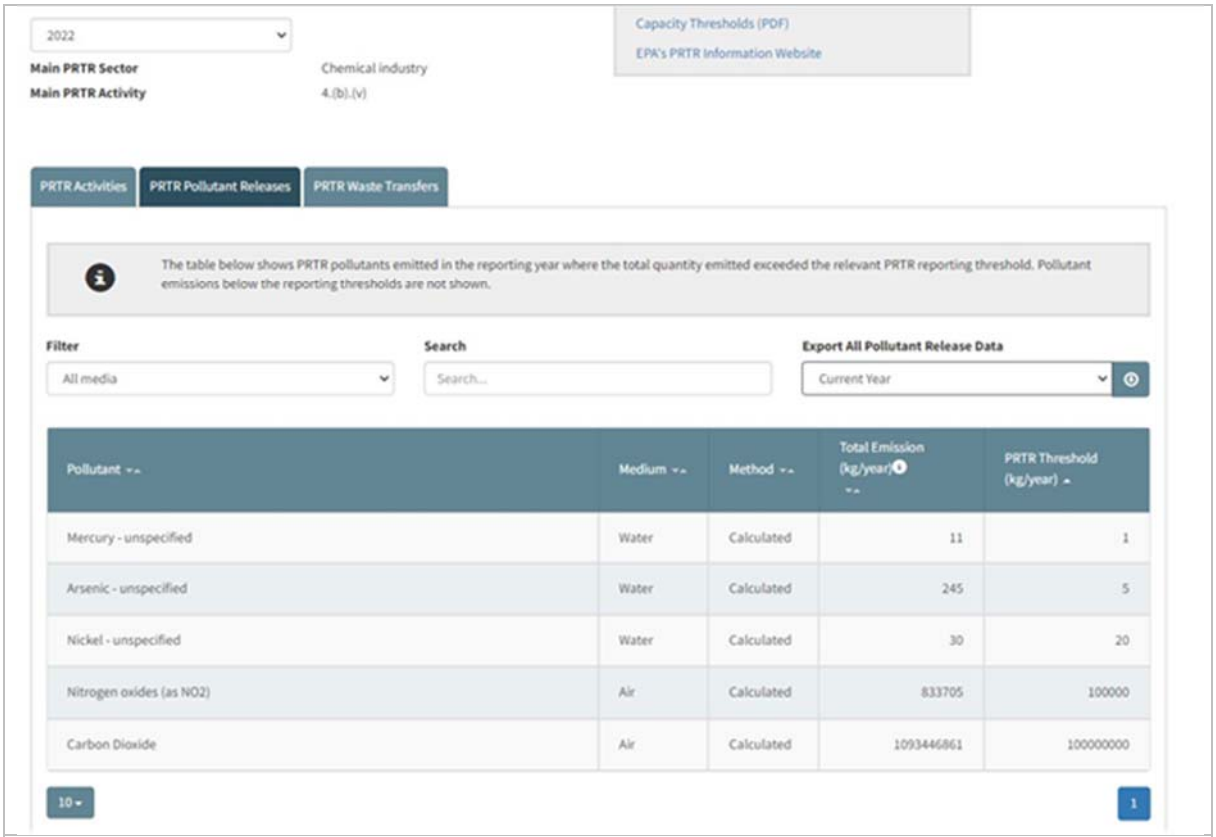


Image 16: Arsenic levels in the AAL application Sediment Analysis are all above 10mg/kg.
Source: EPA

Arsenic emissions from 2022 EPA records into the Shannon Estuary from AAL activities are eye wateringly high: 49 times the safety limit.
Other phylotoxic substances are also off the charts:
- Mercury is 10 times higher than the safety limit;
- Chromium 1.5 times higher than the limit in 2021.
- Cadmium was almost double the safety limit in 2020.

[54] Gao et al., 2018
[55] Assessing the legacy of red mud pollution in a shallow freshwater lake: arsenic accumulation and speciation in macrophytes
[56] https://www.hbm4eu.eu/wp-content/uploads/2022/07/HBM4EU_Policy-Brief-Arsenic.pdf
[57] https://www.sciencedirect.com/science/article/abs/pii/S0025326X23010196

How is this possible? Is this at all legal? And if so, for who is the Law written? Can the EPA explain why the safety threshold for Arsenic was increased in 2018 and if this was justifiable, given the 2016 findings of a lower phylotoxic level of 3-10 mg/kg for arsenic as mentioned above.

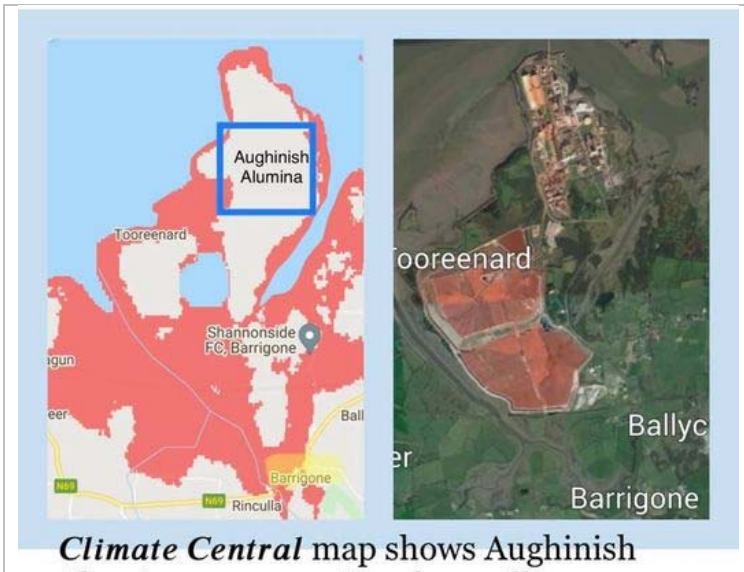


Image 17:

We must also point out, a much wider environmental issue, that residents in Clare, Limerick and Kerry and environmentalists across Ireland are terrified about the possibility of a sudden and catastrophic collapse of the tailing damns at AAL. In 2017, Dr Paul Connett, a US expert in environmental chemistry

> *'described as "reckless" the proposal by the firm to create a borrow pit by 'blasting' rock adjacent to the millions of tonnes of red mud, which is a waste product from the bauxite refining process'.*[58]

and

> 'Looking at this, it's only a matter of time before that waste ends up in the Shannon Estuary.' [59]

The example of Ajka refinery dam wall in Hungary in 2010 must give adequate warning to the EPA in Ireland. Approx. one million cubic meters of red mud flowed into the surrounding countryside. Nine people were killed in the disaster, 122 injured and the contamination included 40 sq km. The nearby Marcal River was reported to have suffered a loss of all living organisms, and within a day the contamination had reached the Danube River as well. Furthermore, 11 other incidents of red mud contamination have occurred in the past 10 years. [60]

Given the current licensing for rock blasting beside the BRDA and the additional risks of increasing weight and height of the BRDA, combined with the increased levels of rainfall, extreme storms and rising sea level, the EPA must take this into account in this application, plan for and more importantly minimise the possibility of this likely catastrophe on the people and ecosystems of the wider Shannon Estuary area.

[58] https://www.limerickleader.ie/video/home/255617/watch-us-expert-calls-for-probe-into-aughinish-plant-in-limerick.html
[59] idem
[60] *Characterization of red mud and its effects on environment due to its traditional methods of disposal*, 2020 https://www.chemijournal.com/archives/?year=2020&vol=8&issue=6&ArticleId=10949&si=false

7 Effects on Aquatic Life - Dredging

The 2005 research paper '*Estuarine Dredge and fill activities: a review of impacts*' states that;

> '*These affects included reduced light penetration by increased turbidity; altered tidal exchange, mixing and circulation; reduced nutrient outflow from marshes and swamps; increased salt water intrusion; and creation of an environment highly susceptible to recurrent, low, dissolved oxygen levels. Coral, oysters and barnacles are particularly vulnerable to the effects of siltation. Both estuarine flora and fauna may be harmed by contaminants released into the water column by dredging operations.'* [61]
>
> *'Fisheries maybe damaged because most sport and commercial species living in estuaries during part or all of their life cycles (Taylor and Saloman, 1968). Decreased diversity in benthic communities as a consequence of dredging and filling is reported for many regions of the world (Rosenberg, 1977). It has been estimated that in Chesapeake Bay alone between the years 1975 and 2025 approximately 740m cu yards of material are scheduled to be dredged to maintain existing channels and to deepen them to accommodate larger vessels (Palmer and Grosse, 1979). In Florida, approx. 150-200 sq. miles of marshland, tideland and estuarine water areas have been lost to dredging and landfills (Krenkel and others, 1976). Both new dredging and maintenance dredging exhibit the potential to damage biological resources and degrade water quality.*' [62]

It has also been found that dredging can deter and disorientate migrating species such as in this case, the European Eel and Atlantic Salmon (Salmo salar).

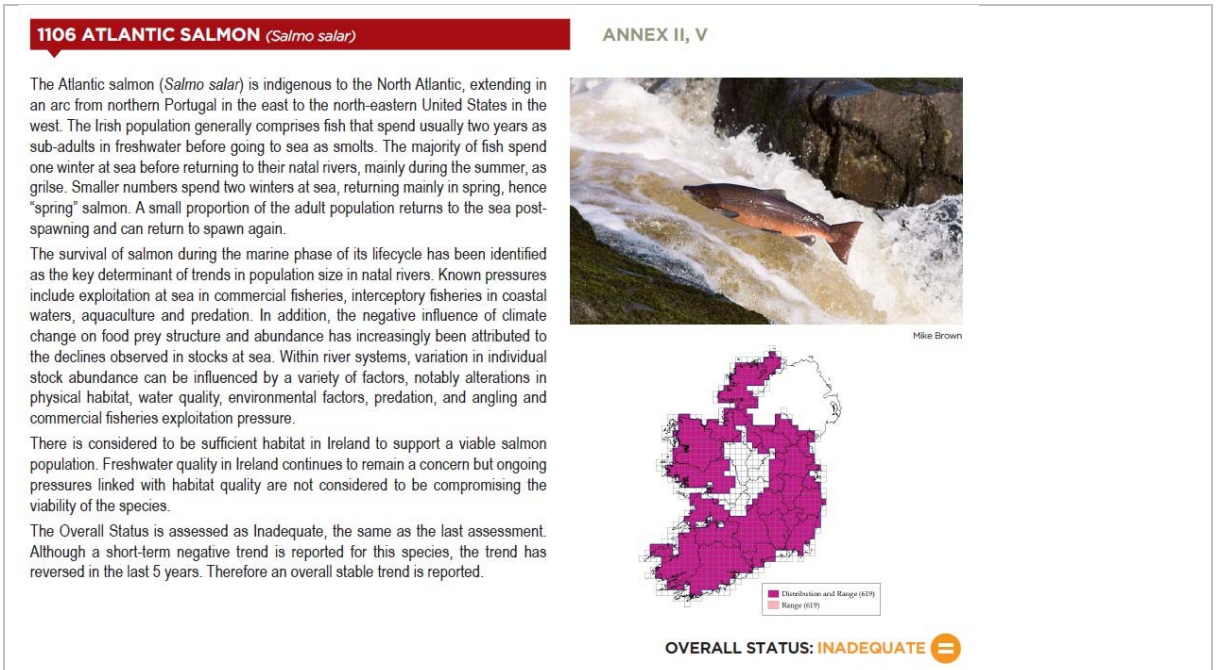


Image 18:
Source: The Status of EU Protected Habitats and Species in Ireland, 2019

> 'Recently bioaccumulation of several metals including cadmium (0.011), lead (0.047), arsenic (0.23), copper (0.92) and mercury (0.36) in mg/kg wet weight was reported in European eels muscle tissues. It was found that the concentration of mercury was

[61] https://www.deepdyve.com/lp/springer-journal/estuarine-dredge-and-fill-activities-a-review-of-impacts-M5eFHHqmQ0?key=springer
[62] Idem

above the threshold limit prescribed by Water Framework Directive Environmental Quality Standards.' [63]

8 Chemicals

The headline of a Guardian article of January 2022 reads:

> 'Chemical pollution has passed safe limit for humanity, say scientists.'

> 'The study concludes that chemical pollution has crossed a "planetary boundary", the point at which human-made changes to the Earth push it outside the stable environment of the last 10,000 years.'[64]

According to the scientific paper '*Detection of heavy metals in fish muscles of selected local fish varieties of the Shitalakshya River and probabilistic health risk assessment*.' 2022, testing fish is a better material for detecting metals in aquatic ecosystems.

> '*According to these viewpoints, fish are a positive indication of metal contamination in aquatic ecosystems because fish are at a higher trophic level in these environments. Fish can be contaminated by heavy metals from the surrounding environment, either directly or indirectly. Metal deposition in the gills suggests in situ metal concentration in water, but metal accumulation in the liver implies deposition of metals for a long time.*'[65]

> 'In recent years, the problem of marine environmental pollution with heavy metals and pesticides has begun to raise a public attention especially in coastal areas. Dumping wastes into marine environments contribute to the larger problem of aquatic pollution, which can seriously damage the marine environment and cause health hazards to people in some areas.'

> 'Recently it was estimated that Hg, Pb, Cr, and Cd from different sources has posed a serious threat to 66 million people globally [6]. Furthermore, the water contamination by As has alone affected >150 million people globally.' [66]

> 'Although several adverse health effects of heavy metals and pesticides have been known for a long time, the exposure to these elements continues; moreover, it is even increasing in some parts of world, in particular in the less developed countries, though emissions have declined in most developed countries over the last 100 years [8]. Owing to their toxicity persistence and tendency to accumulate in water and sediment, heavy metals, metalloids and pesticides when occurring in higher concentrations, become severe poisons for all living organisms.'

> 'Heavy metals, such as cadmium, lead, arsenic , chromium, mercury and copper, are among the most dangerous and abundant inorganic environmental pollutants, arising from industrial discharges and mining practices [20].'

> 'Heavy metal contamination may have devastating effects on the ecological balance of the recipient environment and the diversity of aquatic organisms.

[63] Sustainable mitigation of heavy metals from effluents: Toxicity and fate with recent technological advancements. Sep 2021.
[64] https://www.theguardian.com/environment/2022/jan/18/chemical-pollution-has-passed-safe-limit-for-humanity-say-scientists
[65] https://doi.org/10.1016/j.meafoo.2022.100065
[66] Sustainable mitigation of heavy metals from effluents: Toxicity and fate with recent technological advancements. Sep 2021.

> 'The presence of heavy metals has been associated with decreased fertility and other reproductive abnormalities in birds, fish, shellfish and mammals, as well as altered immune function [24]. Heavy metals like mercury and cadmium are known to accumulate in marine organisms, and cause rapid genetic changes.'[67]

Scientific studies prove that heavy metals seriously impact aquatic wildlife, for this reason alone a dredging/ dumping at sea license should be refused. The contaminated material on the sea bed on the AAL applications sites do needs to be brought on land and contained and monitored appropriately.

9 Public Health

According to the AAL application Environmental Report, page 26, section on EU Directive Annex III - SELECTION CRITERIA REFERRED TO IN ARTICLE 4(3) – The relevance of the project development to public health is referred to as 'No'.

> *'H: the risks to human health (for example, due to water contamination or air pollution). No'*

As mentioned before fish take in heavy metals and toxins… some of which are listed on the Annex 1 priority substance list of the Environmental Quality Standards of the EU Directive 2008/105/EC. Can the EPA guarantee that the fish in the Estuary will not be contaminated and that the fish will not be consumed by larger mammals or humans?

> 'The dredge sites are located outside of any marine navigation, fishing or aquaculture areas.'

According to the Aquaculture License Viewer there is one active within 500m to the east of the proposed dredging sites. This aquaculture license was renewed in 2019. Can the EPA guarantee that no heavy metals or Annex 1 priority substance list from Environmental Quality Standards of the EU Directive 2008/105/EC will be ingested by the crustaceans farmed here.

The EPA must also take into account the cumulative impact of all AAL activities which are known to have devastating and long-term impacts on public health.

10 Licencing process

According to section 5(a) of the Dumping at Sea Act 1996 as Amended a notice of the application in 'a newspaper circulating in the area adjacent to the site of the proposed dumping'. The dumping site seems to be in County Clare. We are not aware that the public notice was made in a Clare or national newspaper. Given that AAL is seen as strategic infrastructure and is Europe's largest alumina refinery and concerns the mother of Ireland's rivers advertising in a local newspaper does not seem sufficient for the implications that it has on ecosystems and our health. In our opinion it must be published in a national newspaper and certainly in the main newspapers of County Clare and Limerick.

Previous dumping at sea license were dealt with by the Minister for Environment. When and why did the EPA take over this task and under who's direction?

In the AAL application documents, the NIS and AA reports, there is reference to the superseded Clare County Council Development Plan and not the current one which is valid from 2023-2029 and came into force in April 2023. The EPA must take this into account.

[67] Heavy metals and Pesticides in Aquaculture: Health problems 2015

The Strategic Integrated Framework Plan for the Shannon Estuary was published in 2013. It is extremely out dated and was written before the 2019 Climate and Biodiversity Declaration. Therefore, any references do not take into account the Climate and Biodiversity Emergency, the Paris Climate Agreement and all other climate/ biodiversity related legislation that came afterwards.

10.1 'Degrowth or Decline and Die'

> 'The total weight of every man made thing (buildings, roads, infrastructure, etc.) doubled every 20 years since the 20th centary began and recently outweighed all biomass (every plant, animal, living organism: all of it). This staggering statistic shows how we cannot have infinite growth on a finite planet.... Humans waste 49% of food, 31% of energy and 85% of ores.' [68]

10.2 Earth is beyond 6 of 9 planetary boundaries

In September 2023 this assessment is the first to assess all of the 9 planetary boundaries and as such is the first health check of the entire planet. They found that

> '*6 of the 9 boundaries have been surpassed because of human caused pollution and destruction of the natural world. This means we are living beyond the capacity of that Earth system and it can no longer be depended on to support our needs.*

Professor Johan Rockstrom, one of the Reports authors, stated that:

> *'If you want to have security, prosperity and equity for humanity on Earth, you have to come back into the safe space and we are not seeing that progress currently in the world.'*[69]

The purpose of maintenance dredging is as follows: (amongst others) '*to allow for the berthing of **larger** ships in conjunction with a **new** unloader being provided on the jetty structure.'*

According to AAL's applications for the expansion of production activities, the plant will need to close by 2030 given its BRDA storage capacity. The permission for extension has not yet been approved. The dredging and dumping at sea permit should not exceed the lifespan of the facility. Why would expansion of such operations be permitted during Climate and Biodiversity Emergency? When will degrowth become a policy, one much needed to bring society back safely within our planetary boundaries?

11 Other legislation that must be taken into account

- Marine Environmental Policy Framework Directive - Hazardous Substances
- REACH regulation - To protect human health and the environment against the harmful effects of chemical substances. [70]
- EU Action Plan *"Towards Zero Pollution for Air, Water and Soil*" - Chemicals for sustainability towards a toxic-free environment.
- EU strategy – pathway to a healthy environment for all

[68] The Future is Degrowth; A Guide to a World beyond Capitalism' Matthia Schmelzer, Andrea Vetter and Aaron Vansintjan

[69] https://thewaterforum.ie/earth-is-beyond-6-of-9-planetary-boundaries/

[70] https://environment.ec.europa.eu/topics/chemicals/reach-regulation_en

12 Conclusion

In our opinion the contaminated dredged sediment cannot be dumped at sea of the reasons listed above and needs to be brought to land and contained and monitored appropriately to avoid further damage to aquatic life.
Furthermore, the EPA seriously needs to focus on protecting environment and public health to protect the citizens and ecosystems of Ireland. Instead of regulating the speed at which

industry destroys the environment the EPA needs to turn the trend of exponential contamination of this planet's finite habitats.

Yours Sincerely,

Mélina Sharp & Michael Eversen

Despite the dramatic improvement in the management and disposal of contaminants in many parts of the world (Valette-Silver 1993; Hornberger et al. 2000), historical contamination poses a real threat to the current ecology of many systems (Sheppard 2005; Norris et al. 2007; Johnston & Roberts 2009). There is substantial knowledge and understanding of the direct impacts on the ecology of organisms inhabiting contaminated soils and sediments (Millward et al. 2004; Ramsey et al. 2005). The threat of these contaminants may, however, extend well beyond those habitats if contaminants can move to other environments (Larsson 1985; Asare et al. 2000; Coulthard & Macklin 2003).

In the marine environment, harbours worldwide have long histories of acting as sinks for contaminants from surrounding industry and urbanization (Cundy et al. 2003; Taylor, Birch, & Links 2004). The major contaminants that flow into harbours are metals, tributyltins, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and pesticides (Fowler 1990). Many of these contaminants rapidly bind to particulate matter in the water-column (McLusky, Bryant, & Campbell 1986) and eventually sink to the seafloor (Birch & Taylor 1999; Cundy et al. 2003). Bound to the sediment, the ecological effects of contaminants are thought to be largely contained (McLusky et al. 1986; Stauber et al. 2000) and mainly affect fauna directly associated with the sediments (i.e. infaunal invertebrates; Clements 2004; Trannum et al. 2004).

The disturbance, or resuspension, of contaminated sediments is a mechanism by which the ecological threat can be transferred beyond the seafloor and potentially affect organisms in the water-column (Birch 2000; Simpson, Apte, & Batley 1998). Sediments have the potential to be remobilized by a range of natural and anthropogenic disturbances such as dredging, trawling, storms, tides and bioturbation (Eggleton & Thomas 2004). There is strong evidence that the resuspension process will release contaminants into the surrounding water-column, and that contaminants may then become biologically available (reviewed in Eggleton & Thomas 2004). Furthermore, at high concentrations, there can be direct effects of suspended sediment (Wilber & Clarke 2001), such as damage to the gills and eyes of fish (Johnston 1981) and clogging of the filtering apparatus of invertebrates (Airoldi 2003). Current chemical and ecotoxicological research suggests that the resuspension of contaminated sediments may pose a real and important threat to the ecology of water-column organisms (Munns, Berry, & Dewitt 2002; Nayar, Goh, & Chou 2004), but there remains no assessment of the ecological impacts from a real-world resuspension event (Eggleton & Thomas 2004). This might because of the large spatial scales involved with these disturbances, the difficulties coordinating and timing assessments of large-scale anthropogenic disturbance, and the perceived difficulties with assessing such ecological effects in the field. Nevertheless, this represents a significant knowledge gap, as the resuspension of contaminated sediments occurs frequently in many contaminated estuaries and ports across the world (Johnston 1981; Eggleton & Thomas 2004).
https://besjournals.onlinelibrary.wiley.com/doi/10.1111/j.1365-2664.2009.01679.x