

Dr JOHN WEBB

# **PRESENTATION OF COMMENTS: APPENDICES**

Under the Town And Country (Inquiries Procedure) (England) Rules 2000

Planning Appeal Reference: **APP/D1265/W/23/3327692**

***APPEAL BY: Powerfuel Portland Limited***

***PROJECT: Construction of an Energy Recovery  
Facility (ERF) with ancillary buildings and works***

***SITE: Land adjacent to Balaclava Bay at Portland***

***Port, Castletown, Portland, Dorset, DT5 1PP***

# CONTENTS

## **A: POLICY, REGULATION, RESEARCH & GUIDANCE 3**

### **INTERNATIONAL & GENERAL 4**

- Atmosphere journal: Jones and Harrison, 2016 'Emission of ultrafine particles ...' 4
- Atmosphere journal: Ventura et al. 27 May 2021, Deposition of Aerosols... 4
- Air Quality Consultants, May 2020, Health Effects ... in London 5
- British Oceanographic Data Centre (BODC) 5
- EU Copernicus Ocean State Report, 7th edition, CMEMS, Oct. 2023 6
- Environmental Sciences Europe: Nano-ecotoxicology 6
- Government Office for Science, Foresight, Future of the Sea Project Review 8
- Intergovernmental Panel on Climate Change (IPCC) 9
- Land-Based Marine Pollution (LBMP) 10
- OSPAR: Convention for Protection of Marine Environment of North-East Atlantic 1998 & 2023 10
- Science Direct, 'Chemical, dimensional and morphological ultrafine particle ...' 11
- Science Direct, 'Sources, characteristics, toxicity, and control of ultrafine particles...' 11
- UNEP's Global Programme of Action for Protection of Marine Environment ... (1995) 11

### **NATIONAL 12**

- Clean Maritime Plan (CD9.20) 12
- Defra et al. Air Quality Expert Group (AQEG), 2018 'Ultrafine Particles (UFP) in the UK' 13
- Conservation of Offshore Marine Habitats and Species Regulations 2017 13
- Defra 2023 Outcome Indicator Framework C4 Diverse seas: condition of seafloor habitats 14
- Environmental Improvement Plan 2023 (first revision, CD9.24) 15
- Marine Strategy Regulations 2010 15
- Maritime 2050: Navigating the Future (Dept. of Transport, CD9, 9.19) 16
- Marine Management Organisation 16
- Marine Policy Statement 16
- National Planning Policy Framework (NPPF) 2023 17
- National Planning Policy for Waste, 2014 (NPPW) 17
- National Policy Statement (NPS), 2023 18
- River Basin District Map c/o the EA, 30 Oct. 2015 19
- UK Climate Change Committee (CCC), Sept. 2023 - Progress Report for England 19
- UK Centre for Ecology & Hydrology (CEH): 'UKCEH Report Card 2020' 20
- UK Marine Policy Statement, 2011 & 2020 (CD9, 9.34) 20
- Waste Management Plan for England, 2021 (WMPE, CD9.07) 21
- Water Framework Directive (England and Wales) Regulations 2017 (SI 2017/407) 21

### **LOCAL TO PORTLAND 22**

- Defra: Chesil Beach & Stennis Ledges - Marine Conservation Zone (MCZ) 22
- Nature Conservation Review for the proposed 'Portland Harbour Fishery Order 2019' 22

## **APPENDIX B: QUANTITY OF PARTICULATE MATTER 23**

## **APPENDIX C: EXCLUSIONS FROM MY TOPIC 26**

## **APPENDIX D: RESPONSIBLE AGENCIES 27**

## **APPENDIX E: ABBREVIATIONS 29**

## **A: POLICY, REGULATION, RESEARCH & GUIDANCE**

These citations date from recent years up to December 2023. Some are directly cited in my Comments whilst others provide background information for the topic.

They are classified according to the geographical scope to which they refer: International and General, National (applying to the UK or England) or Local to Portland. The quotations are snippets of text around and bearing on the topic of these comments, i.e. impacts of particulate emissions on coastal and marine habitats. They are not free-standing so each extract should be read and understood in the original context including their own footnotes (omitted here for clarity) in the relevant source document as cited.

## INTERNATIONAL & GENERAL

---

Atmosphere journal: Jones and Harrison, 2016 'Emission of ultrafine particles ...'

Jones, A.M., Harrison, R.M., University of Birmingham, 'Emission of ultrafine particles from the incineration of municipal solid waste: A review', in Atmospheric Environment (2016), doi: 10.1016/j.atmosenv.2016.06.005 (*an unedited, unpublished manuscript as at 9 Dec. 2023*)

<http://pure-oai.bham.ac.uk/ws/files/29354815/>

[Emission\\_of\\_Ultrafine\\_Particles\\_from\\_the\\_Incineration\\_ACCEPTED\\_MANUSCRIPT.pdf](#)

Highlights: "Incineration is increasing as a waste disposal option / Atmospheric emissions are an important concern / Abatement plant is highly efficient for particulate matter / Ultrafine particle emissions are generally very low"

"The purpose of this review is to identify reports of measurements of ultra fine particulate in the flue gases from MSW incinerators, and to assess their relevance to the operation of MSW incinerators in the United Kingdom."

---

Atmosphere journal: Ventura *et al.* 27 May 2021, Deposition of Aerosols...

Atmosphere 2021, 12(6), 684; <https://doi.org/10.3390/atmos12060684>

Article: 'Deposition of Aerosols onto Upper Ocean and Their Impacts on Marine Biota'.

Research findings on effects on marine biota are reviewed in Ventura *et al.* 2021, 'Atmosphere' 12(6), page 684: <https://doi.org/10.3390/atmos12060684>, citing Liu *et al.*, for example noting on page 12: "... the presence of fine particulates with a diameter of approximately 1µm (PM1.0) in sea anemones, which are released from fossil fuel combustion into the air. These marine organisms are suspension/filter feeders and, therefore, can incorporate and accumulate suspended particles, including PM1.0 particles, in their bodies.

The same research team reported that the bioaccumulation factor of PM1.0 in sea anemones was 5-7 orders of magnitude. Furthermore, a maternal transfer of PM1.0 was

also suggested based on the existence of PM in sea anemone eggs and juveniles, suggesting that fine PM accumulation in marine biota is a long lasting issue once it occurs. The study of Liu et al. also highlight that the hazardous fine PM may pose a serious risk to other marine organisms via the food web. ...”.

---

## Air Quality Consultants, May 2020, Health Effects ... in London

Article: 'Health Effects due to Emissions from Energy from Waste Plant in London'

Page 15, para, 3.21 gives a brief discussion of particle sizes, while noting a potential for coagulation: “The available evidence on particle size distributions thus suggests that almost all PM emitted from such facilities is likely to be in the form of PM<sub>2.5</sub> (and thus also PM<sub>10</sub>) (Buonanno *et al.* (2009)). Particle size distributions can change following release from stacks; for example smaller particles may coagulate together to form larger particles.” BioScience: 2023 State of the Climate Report: Entering uncharted territory

Article: William Ripple *et al.*, 2023 State of the Climate Report - Entering uncharted territory | BioScience | Oxford Academic

Synopsis: [https://www.researchgate.net/publication/374975790\\_The\\_2023\\_state\\_of\\_the\\_climate\\_report\\_Entering\\_uncharted\\_territory](https://www.researchgate.net/publication/374975790_The_2023_state_of_the_climate_report_Entering_uncharted_territory)

“... We are entering an unfamiliar domain regarding our climate crisis, a situation no one has ever witnessed firsthand in the history of humanity. In the present report, we display a diverse set of vital signs of the planet and the potential drivers of climate change and climate-related responses first presented by Ripple and Wolf and colleagues (2020), who declared a climate emergency, now with more than 15,000 scientist signatories. The trends reveal new all-time climate-related records and deeply concerning patterns of climate-related disasters. At the same time, we report minimal progress by humanity in combating climate change. ...”

---

## British Oceanographic Data Centre (BODC)

<https://www.bodc.ac.uk>

Research Vessel Cruise Inventory, 1945 to date:

[https://www.bodc.ac.uk/resources/inventories/cruise\\_inventory/](https://www.bodc.ac.uk/resources/inventories/cruise_inventory/)

Jointly supported by BODC and the Marine Environmental Data and Information Network.

“Within our request area you will be able to build your search, select data series, modify your selection and opt to receive the data ...”

---

## EU Copernicus Ocean State Report, 7th edition, CMEMS, Oct. 2023

Copernicus Ocean State, 7th edition, Copernicus Marine Environment Monitoring Service (CMEMS) <https://marine.copernicus.eu>

“... showed mostly no clear trend over the last 2 decades ...”

Chapter 2: Updated and new pathways in ocean science

2.3 Satellite monitoring of surface phytoplankton functional types in the Atlantic Ocean over 20 years (2002–2021)

Chapter 3: Ocean state and change for relevance to society

3.1 Dissolved oxygen as an indicator of multiple drivers of the marine ecosystem: the southern Adriatic Sea case study

3.2 Characterization of the organic vs. inorganic fraction of suspended particulate matter in coastal waters based on ocean color radiometry remote sensing [spelling as in original; emphasis added]

- via satellite observation, from ocean colour radiometry (OCR) ... a proxy for particulate composition (PPC) can be estimated from OCR observations ... validated using a broad range of biogeochemical data collected in various contrasted coastal waters ... over the global coastal ocean at a 1 km × 1 km spatial resolution from 2002 to 2012. The relevance of the temporal occurrence of PPC in a given water pixel has been illustrated over the global coastal ocean, and its pertinence has been discussed in depth for the English Channel and the southern North Sea, which are characterized by a well-documented variability in suspended particulate matter composition.”

---

## Environmental Sciences Europe: Nano-ecotoxicology

Bundschuh *et al.*, ‘Nanoparticles in the environment: where do we come from, where do we go to?’

Environmental Sciences Europe volume 30, Article number: 6 (2018)

<https://enveurope.springeropen.com/articles/10.1186/s12302-018-0132-6>

*From the abstract: (see original for cross-references to source research papers)*

“Quantification of NP emissions into the aquatic environment has by now, however, been hampered by the lack of appropriate analytical techniques.”

“... the effects of nanoparticles on aquatic and terrestrial systems have received increasing attention. While the debate on the relevance of nanoparticle-released metal ions for their toxicity is still ongoing, it is a re-occurring phenomenon that inert nanoparticles are able to interact with biota through physical pathways such as biological surface coating. This among others interferes with the growth and behaviour of exposed organisms. Moreover, co-occurring contaminants interact with nanoparticles. ...”

“NP in the environment undergo ageing processes such as chemical transformation, aggregation, and disaggregation. The interplay between these processes and the NP transport determines the fate and ultimately the ecotoxicological potential of NP. Since particle properties and environmental conditions control these ageing and transport processes, a direct transfer of data to even slightly deviating conditions is difficult and can even be misleading.”

“The present paper, however, specifically focuses on dissolution, passivation, aggregation, adsorption, sedimentation, and deposition as a selection of the most relevant processes under field conditions.”

“Roughly a decade ago and thus with the initiation of the research field ‘nano-ecotoxicology’, Moore as well as Hund-Rinke and Simon suggested that NP have the potential to cause harmful effects in biota by the formation of reactive oxygen species (ROS) that could affect biological structures. Moore also pointed to the potential of NP to function as carriers for other pollutants—an assumption that will be addressed in more detail in the next chapter. While it is evident from the literature that oxidative stress can indeed be a driver for many NP-induced effects, the last decade of research showed that NP have the ability to act via multiple pathways of which the induction of oxidative stress is one.”

“No mechanism of toxicity can be considered as generic for all NP. Oxidative stress is, however, a frequently reported phenomenon. Just to name a few other relevant mechanisms, physiological implications that can go as far as reproductive failure by modifying hormones or hatching enzymes were reported. Those effects indicate implications in population development and suggest the potential for transgenerational

effects. In addition, algae and aquatic plants were altered in their photosynthetic pigment composition and showed effects in photosystem II, while we refer to Thwala et al. for a more detailed review.”

“In aquatic systems, structural and functional changes, such as photosynthetic efficiency and leaf decomposition were reported, although often at rather high concentrations. These examples suggest that NP can indeed affect species but also species interactions at various trophic levels. At the same time, neither the mechanisms driving these changes nor the consequences for the wider food web or whole ecosystems have yet even been addressed.”

“Although most studies highlight effects at relatively high NP concentrations, more recent approaches document sublethal implications at field-relevant levels particularly over multiple generations. Thus, the impact of NP under current and future exposure scenarios (including co-exposure to other stressors) on communities, ecosystems, ecosystem functions as well as interactions across ecosystem boundaries deserves special attention. Particularly for sparingly soluble or insoluble NP that may accumulate in certain environmental compartments (e.g. sediments) over time, investigations covering multiple years of (repeated) exposure and assessment are suggested to properly assess their potential long-term implications in aquatic and terrestrial ecosystems. This aspect directly links to the acknowledgement of NP-induced alterations in horizontal and vertical trophic interactions with food webs.”

---

## Government Office for Science, Foresight, Future of the Sea Project Review

The future of marine biodiversity and marine ecosystem functioning in UK coastal and territorial waters (including UK Overseas Territories) by Frithjof C. Küpper & Nicholas A. Kamenos, November 2017

“Seaweed distribution in UK waters has undergone significant changes in recent decades; this is associated with changing sea surface temperatures, which have led to significant declines in the south for kelp species and increases in northern and central areas for some kelps and wracks (Yesson et al., 2015).”

### Executive Summary

“Key stressors on biodiversity in UK waters (including overseas territories) are changes in ecosystem functioning due to biodiversity loss caused by ocean warming (e.g. species replacement and migration), sea level rise (e.g. loss of habitats including salt marshes),



plastic pollution (e.g. entanglement and ingestion), alien species (e.g. outcompeting native UK species and parasite transmission), overexploitation (e.g. loss of energy supply further up the food web), habitat destruction (e.g. loss of nursery areas for commercially important species) and ocean acidification (e.g. skeletal weakening of ecosystem engineers including cold water corals). These stressors are currently affecting biodiversity, and their impact can be projected for the future. All stressors may act alone or in synergy, and importantly, contemporary stressors may also continue into the future.”

---

## Intergovernmental Panel on Climate Change (IPCC)

“The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change.”

### AR6 Synthesis Report: Climate Change 2023

Marine ecosystems in a changing climate – Insights from the IPCC’s Sixth Assessment Report (AR6) - Synthesis Report by the Ocean & Climate Platform (OCP), March 8th, 2023

“Marine ecosystems play a critical role for the climate, biodiversity and human societies. From coastal areas to the depths of the ocean, the diversity of marine ecosystems is considerable. They are critical to climate change mitigation and adaptation. The ocean absorbs close to 30% of CO<sub>2</sub> emissions from human activities. The so-called “biological carbon pump”, partly relies on phytoplankton or blue carbon ecosystems (mangroves, seagrass meadows and salt marshes) which absorb CO<sub>2</sub> emissions through photosynthesis. Ecosystems and marine biodiversity are closely intertwined. Certain marine ecosystems, such as kelp forests, provide habitats and shelters for a multitude of species to feed, reproduce and grow. Besides, our societies, livelihoods and cultures highly depend on the ocean. From food provision, to the protection against extreme events, or even the supply of resources for medicines and materials for infrastructure, human well-being is closely linked to the health of marine ecosystems.

Towards a tipping point: marine ecosystems on the front line of climate change

Marine ecosystems are increasingly vulnerable to climatic and human stressors, so much that some are already reaching a tipping point. Their collapse is conducive to the extirpation and extinction of marine species, with significant consequences on life in the sea or on land. Over the last century, days of marine heatwaves have increased by 54%

leading to mass mortality in many marine species. Without a drastic reduction of greenhouse gases emissions, the frequency of these phenomena is bound to increase.”

---

## Land-Based Marine Pollution (LBMP)

LBMP (uncompleted) was superseded in 1995 by the UNEP’s Global Programme of Action for the Protection of the Marine Environment (*see below*).

Article: Porter. Hoagland, ... Christine Burns, in Encyclopedia of Ocean Sciences (Third Edition), 2019: <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/land-based-marine-pollution>

“Land-based marine pollution (LBMP), although it accounts for an estimated 80% of all contaminants entering the sea, is regulated only at the national level throughout most of the world, with the exception of six regional seas where multilateral agreements are in force.”

“There is a marked lack of research into the UK’s subtidal seabed habitats...”

“... the internationally recognised topic of Land Based Marine Pollution (LBMP). ...”

Superseded by UNEP’s Global Programme of Action for the Protection of the Marine Environment Against Land-Based Activities (1995)

“The GPA is the only global intergovernmental mechanism directly addressing the connectivity between terrestrial, freshwater, coastal and marine ecosystems.”

---

## OSPAR: Convention for Protection of Marine Environment of North-East Atlantic 1998 & 2023

<https://www.unescwa.org/sd-glossary/convention-protection-marine-environment-north-east-atlantic-ospar>

The UK is a party to the OSPAR Convention.

Definition in the OECD’s Glossary

“The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) requires contracting parties to take all possible steps to prevent and eliminate pollution of the marine environment. Also, contracting parties are required to take the necessary measures to protect the maritime area against the adverse effects of human

activities so as to safeguard human health and to conserve marine ecosystems and, when practicable, restore those areas that have been damaged.”

Legal note: <https://cert-www.lexisnexis.co.uk/legal/guidance/convention-for-the-protection-of-the-marine-environment-of-the-north-east-atlantic-ospar-snapshot>

---

Science Direct, ‘Chemical, dimensional and morphological ultrafine particle ...’

Buonanno *et al.*, 2011 ‘Chemical, dimensional and morphological ultrafine particle characterization from a waste-to-energy plant’ *Waste Manage.*, 31 (11) (2011), pages 2253-2262

<https://www.sciencedirect.com/science/article/pii/S1674987121000116#bbb0365>

“UFPs are unstable and become larger particles through coagulation and condensation. ...”

---

Science Direct, ‘Sources, characteristics, toxicity, and control of ultrafine particles...’

Research paper: Andrea L. Moreno-Ríos, 13 Dec. 2021, ‘Sources, characteristics, toxicity, and control of ultrafine particles: An overview’

<https://www.sciencedirect.com/science/article/pii/S1674987121000116#bbb0365>

“This paper presents an overview of emission sources, physicochemical characteristics, collection and measurement methodologies, toxicity, and existing control mechanisms for ultrafine particles (UFPs) in the last fifteen years.” [to 2020]

---

UNEP’s Global Programme of Action for Protection of Marine Environment ... (1995)

<https://iwlearn.net/iw-projects/organizations/418>

“The GPA is the only global intergovernmental mechanism directly addressing the connectivity between terrestrial, freshwater, coastal and marine ecosystems.”

“Swimmers, surfers and sunbathers might not notice, but our oceans are in deep trouble. Levels of acidity are increasing, creating a hostile environment in which calciferous plankton, crustaceans, molluscs and coral reefs are stressed and the resilience of entire ecosystems is threatened. This process, which is taking place at a more rapid pace than has been observed in the past, is a consequence of the oceans taking up more than a quarter of the carbon dioxide produced from the burning of fossil fuels.”

<https://iwlearn.net/news/projects/92cda868a4c243f1b6ed619bdeaa1a27>

## NATIONAL

---

### Clean Maritime Plan (CD9.20)

<https://www.gov.uk/government/publications/clean-maritime-plan-maritime-2050-environment-route-map>

Page 11, para. 23: “When setting any targets the wider context of the UK Governments UK-wide target to achieve domestic net zero emissions of Greenhouse Gas by 20250, and significant pollutant reduction targets at 2020 and 2030 ... may provide useful context. More directly the port should consider any relevant, binding targets associated with local government.” - referring to Table 1, ‘UK National Economy-wide targets levels based on 2005 baseline’, in which the third column shows reduction target levels as follow:

#### **Primary particulate Matter PM**

2020 30%

2030 46%

#### Document titles in this set

“Guidance | Clean maritime plan: ... The government’s route map for the transition to a future of zero emission shipping”

“Port Air Quality Strategies”

“Potential demands on the UK energy system from port and shipping electrification”

---

## Defra *et al.* Air Quality Expert Group (AQEG), 2018 ‘Ultrafine Particles (UFP) in the UK’

[https://uk-air.defra.gov.uk/assets/documents/reports/cat09/1807261113\\_180703\\_UFP\\_Report\\_FINAL\\_for\\_publication.pdf](https://uk-air.defra.gov.uk/assets/documents/reports/cat09/1807261113_180703_UFP_Report_FINAL_for_publication.pdf)

“Size-specific efficiencies in different studies ranged from over 99.9% at 10 nm and 100 nm diameter, to from < 90% to ca. 99.5% at the efficiency minimum of around 30 µm diameter. The implication of this highly effective removal was that UFP concentrations in incinerator stack gases, were frequently lower than those in the ambient air used in the combustion process (Jones and Harrison 2016).”

---

## Conservation of Offshore Marine Habitats and Species Regulations 2017

### **Co-ordination where more than one competent authority is involved**

Section 35.—(9): “In determining whether a plan or project should be agreed to under regulation 29(1), a competent authority other than the Secretary of State must seek and have regard to the views of any other competent authority or authorities involved. ”

where:

#### **“Considerations of overriding public interest**

Section 29.—(1) If it is satisfied that, there being no alternative solutions, the plan or project referred to in regulation 28(1) must be carried out for imperative reasons of overriding public interest (which, subject to paragraph (2), may be of a social or economic nature), the competent authority may agree to the plan or project notwithstanding a negative assessment of the implications for the site.”

#### **“Prevention of deterioration of habitats and disturbance of species**

Section 26.—(1) In so far as their functions may be exercised to secure that appropriate steps are taken for the purpose mentioned in paragraph (2), competent authorities must exercise their functions to secure that such steps are taken.

(2) The purpose referred to in paragraph (1) is the avoidance of—

- (a) the disturbance of species specified in paragraph (3); and
- (b) the deterioration of habitat or habitat types specified in paragraph (4).

“(11) So far as lies within its powers, a competent authority in exercising any function in or in relation to the offshore marine area must use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds (except habitats beyond the outer limits of the area to which the Wild Birds Directive applies).

(12) Paragraph (1) does not apply where—

(a) the cause of the disturbance of species or deterioration of habitat or habitat types specified in paragraph (3) or (4) is a plan or project that has been agreed to under regulation 28; or

(b) the disturbance of species specified in paragraph (3) is not a criminal offence under regulation 38 or Part 3.”

**“Applicant’s assessment**

4.2.13 Where residual impacts relate to HRA or MCZ sites then the Applicant must provide a derogation case, if required, in the normal way in compliance with the relevant legislation and guidance.”

---

## Defra 2023 Outcome Indicator Framework C4 Diverse seas: condition of seafloor habitats

(for the UK)

Images C4i: Regional sea assessments, and the status of coastal water bodies for seagrass, 2010 to 2015

The regional sea area of the Eastern Channel (including around Portland) is shown on the map as having Good Ecological Status above target.

“Assessment of change

No assessment of change was undertaken for this indicator as a suitable time series is not yet available in the Outcome Indicator Framework.”

“Relevant target(s) in the 25 Year Environment Plan

Reversing the loss of marine biodiversity and, where practicable, restoring it

Ensuring seafloor habitats are productive and sufficiently extensive to support healthy, sustainable ecosystems” Environmental Improvement Plan (EIP) 2023

Page 126, “Goal 4 - Managing exposure to chemicals and pesticides”“Tackle chemical pollution at source through regulatory action, including banning or restricting the most harmful chemicals”

Page 73, “... decrease in emissions office particulate matter (PM2.5) ... between 2010 and 2020. ... We are taking further action on PM2.5,...”

---

## Environmental Improvement Plan 2023 (first revision, CD9.24)

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1168372/environmental-improvement-plan-2023.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1168372/environmental-improvement-plan-2023.pdf)

Page 74: “A legal target to reduce population exposure to PM2.5 by 35% in 2040 compared to 2018 levels, with a new interim target to reduce by 22% by the end of January 2028.”

Page 188: “Due to climate change, we will see more intense and changeable weather and coastal erosion; an increase in risks from pests, pathogens and invasive non-naive species; and knock-on effects on our ecosystems, habitats, species, and agricultural, forestry and marine productivity. ~This mens that we must go further to build the climate resilience of our ecosystems.

...

Nature and land-based sectors therefore must go beyond net zero and become carbon negative by 2050 in order to support the rest of the economy. ... ”

---

## Marine Strategy Regulations 2010

<https://www.legislation.gov.uk/ukxi/2010/1627/contents/made>

### Part 2. Directive definitions:

“‘pollution’ means the direct or indirect introduction into the marine environment, as a result of human activity, of substances or energy, including human-induced marine underwater noise, which results or is likely to result in deleterious effects such as harm to living resources and marine ecosystems, including loss of biodiversity, hazards to human health, the hindering of marine activities, including fishing, tourism and recreation and other legitimate uses of the sea, impairment of the quality for use of sea water and

reduction of amenities or, in general, impairment of the sustainable use of marine goods and services;”

---

## Maritime 2050: Navigating the Future (Dept. of Transport, CD9, 9.19)

<https://www.gov.uk/government/publications/maritime-2050-navigating-the-future>

Page 21: “... the introduction of the North Sea Emission Control Area (ECA) ... ”

Page 22, schematic: ‘Sources of marine air pollution’

Page 37: “Communication, navigation and exploration / Short-term (1-5 years) | Uk to commence charting its own seabed and EEZ [*Exclusive Economic Zone*] seabed using autonomous vessels to understand the potential economic benefits of the seafloor.”

---

## Marine Management Organisation

CD4.83: Consultee response for application WP/20/00692/DCC from Marine Management 10/02/2022: Marine Licensing, Wildlife Licences and other permissions

### **Marine Licensing**

“Works activities taking place below the mean high water mark may require a marine licence in accordance with the Marine and Coastal Access Act (MCAA) 2009.

Such activities include the construction, alteration or improvement of any works, dredging, or a deposit or removal of a substance or object below the mean high water springs mark or in any tidal river to the extent of the tidal influence.

Applicants should be directed to the MMO’s online portal to register for an application for marine licence: <https://www.gov.uk/guidance/make-a-marine-licence-application>”

---

## Marine Policy Statement

(CD9.34; as cited in NPPF 2023)

“The Marine Policy Statement sets a high level objective as follows:

### **Living within environmental limits**

Biodiversity is protected, conserved and where appropriate recovered and loss has been halted.



Healthy marine and coastal habitats occur across their natural range and are able to support strong, biodiverse biological communities and the functioning of healthy, resilient and adaptable marine ecosystems.

Our oceans support viable populations of representative, rare, vulnerable, and valued species.” (*emphasis added*)

---

## National Planning Policy Framework (NPPF) 2023

The NPPF (CD9.01) now requires that:

“In coastal areas, planning policies and decisions should take account of the UK Marine Policy Statement (MPS) and marine plans. Integrated Coastal Zone Management should be pursued across local authority and land/sea boundaries, to ensure effective alignment of the terrestrial and marine planning regimes.” [emphasis added]

The NPPF also specifies that:

“Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures.” [then footnote 53:] “In line with the objectives and provisions of the Climate Change Act 2008...” [emphasis added]

and also:

“Planning policies and decisions should contribute to and enhance the natural and local environment by: ... d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; ...”.

---

## National Planning Policy for Waste, 2014 (NPPW)

The NPPW (CD9.02) page 9, item d. on nature conservation specifies that:

“Considerations will include any adverse effect on a site of international importance for nature conservation (Special Protection Areas, Special Areas of Conservation and RAMSAR Sites), a site with a nationally recognised designation (Sites of Special Scientific Interest, National Nature Reserves), Nature Improvement Areas and ecological networks and protected species.” (*emphasis added*)

Hence insofar as the Appellant's proposal would potentially cause harm to coastal and marine habitats, it would conflict with the NPPF and so this consideration should be weighed against it in the planning balance.

---

## National Policy Statement (NPS), 2023

Department for Energy Security & Net Zero

<https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure>

*Note: "The 2011 versions of the National Policy Statements remain in force until the revised NPS are designated in early 2024."*

Overarching National Policy Statement for Energy (EN-1), CD9.04

### **"4.5 Marine Considerations**

4.5.1 The Marine Policy Statement is the framework for preparing Marine Plans and taking decisions affecting the marine environment, as per section 44 of the Marine and Coastal Access Act 2009. Marine plans apply in the 'marine area', which is the area from mean high water springs to the seaward limit of the Exclusive Economic Zone (EEZ). The 'marine area' also includes the waters of any estuary, river or channel, so far as the tide flows at mean high water spring tide.

4.5.2 Marine plans set out marine specific aspects of many of the assessment principles in Part 4 and 5 of this NPS. Individual Marine Plans must be consulted to understand marine relevant specific considerations.

4.5.3 The cross-government Marine Spatial Prioritisation Programme will review how marine plans and the wider planning regime, legislation and guidance may need to evolve to ensure a more holistic approach to the use of the seas is taken and to maximise co-location possibilities."

5.2.17 The Secretary of State should give air quality considerations substantial weight where a project is proposed near a sensitive receptor site, such as an education or healthcare facility, residential use or a sensitive or protected habitat.

5.2.18 Where a project is proposed near to a sensitive receptor site for air quality, if the applicant cannot provide justification for this location, and a suitable mitigation plan, the Secretary of State should refuse consent."

National Policy Statement for Renewable Energy Infrastructure (EN-3), CD9.04

### **2.7 Biomass and Waste Combustion**

“2.7.29 Applicants must ensure EfW plants are fit for the future, ...”

---

## River Basin District Map c/o the EA, 30 Oct. 2015

<https://www.gov.uk/government/publications/river-basin-district-map>

Page 36: This “applies to surface waters (including some coastal waters) and groundwater (water stored below the ground in rocks or other geological strata). These regulations set out requirements to prevent deterioration of aquatic ecosystems and protect, enhance and restore water bodies to ‘good’ status.”

JW comment: These regulations may apply to The Fleet lagoon, the waterway through to Portland Harbour and some coastal (‘transitional’) waters around the harbour.

---

## UK Climate Change Committee (CCC), Sept. 2023 - Progress Report for England

<https://www.theccc.org.uk/publication/2023-progress-report-to-parliament/>

Page 64: “(ii) Outcome 3b: Protected and resilient habitats

- Extent of protected sites at sea in England has increased over the last five years. The extent of sea around England protected through national and international protected areas increased by 83% over the last five-years to represent 47% of inshore waters (Figure 2.6).
- There has been a decline in the overall condition of protected coastal sites. The proportion of coastal SSSIs classed as in ‘favourable’ or ‘unfavourable recovering’ condition declined from 96% in 2016 to 91% 2022. This, however, remains relatively high compared to terrestrial and freshwater habitats.
- Condition of seafloor ecosystems varies depending on habitat type. The UK Marine Strategy target of ‘Good’ or ‘High’ Ecological Status was met for most surveyed locations for seagrass and rocky shore macroalgae, but the target was not met for large areas of saltmarsh and for some soft sediment invertebrate communities.” *[footnote to Defra (2023) Outcome Indicator Framework C4...]*

---

## UK Centre for Ecology & Hydrology (CEH): ‘UKCEH Report Card 2020’

Reports; <https://uk-scape.ceh.ac.uk/resources/reports-and-outputs>

“...the UK Centre for Ecology & Hydrology (UKCEH) [is], a world-class research organisation focusing on terrestrial and freshwater ecosystems and their interaction with the atmosphere.”

“The Environmental Information Data Centre (EIDC) is part of the Natural Environment Research Council's (NERC) Environmental Data Service and is hosted by the UK Centre for Ecology & Hydrology (UKCEH). The EIDC manages nationally-important datasets concerned with the terrestrial and freshwater sciences.” <https://eidc.ac.uk>

Article: Impacts of climate change on UK coasts and seas are highlighted’

<https://www.ceh.ac.uk/news-and-media/news/impacts-climate-change-uk-coasts-and-seas-highlighted>

“This report collates important new evidence which highlights how climate change has already affected UK coasts and seas, and the ways it will continue to do so in the coming decades. This information is crucial to not only help develop adaptation measures and management actions to support vulnerable marine life and habitats, but also to help UK industries and society prepare for and adapt to these far-reaching marine climate impacts.”

---

## UK Marine Policy Statement, 2011 & 2020 (CD9, 9.34)

<https://www.gov.uk/government/publications/uk-marine-policy-statement>

MPS 2011 version

Page 18: **2.6 Detailed considerations**

**“2.6.1 Marine ecology and biodiversity**

2.6.1.1 Marine plan authorities should be mindful that, consistent with the high level marine objectives, the UK aims to ensure:

- A halting and, if possible, a reversal of biodiversity loss with species and habitats operating as a part of healthy, functioning ecosystems; and

- The general acceptance of biodiversity’s essential role in enhancing the quality of life, with its conservation becoming a natural consideration in all relevant public, private and non- governmental decisions and policies.”

Pages 18 & 20: **Issues for consideration**

2.6.4.3 The marine plan authority should satisfy itself where relevant that any development will not cause a deterioration in status of any water to which the WFD applies, subject to the provision of Article 4.7 of that Directive, or prevent compliance with any WFD obligation and is consistent with the requirements of daughter directives of the WFD including those on priority substances and groundwater. Decision makers should also take into account impacts on the quality of designated bathing waters and shellfish waters from any proposed development.”

Guidance from 1 January 2021

(about converting measures selectively into UK law)

---

## Waste Management Plan for England, 2021 (WMPE, CD9.07)

<https://www.gov.uk/government/publications/waste-management-plan-for-england-2021>

Public authorities must “have regard to the Marine Policy Statement and relevant marine plans when taking other decisions that might affect the UK marine area.”

---

## Water Framework Directive (England and Wales) Regulations 2017 (SI 2017/407)

Statutory Instrument: <https://www.legislation.gov.uk/ukxi/2017/407/made> (2015)

About: The Water Environment - although it may only apply to main river basins as designated; prescribes monitoring duties of the EA.

Page 36: This “applies to surface waters (including some coastal waters) and groundwater (water stored below the ground in rocks or other geological strata). These regulations set out requirements to prevent deterioration of aquatic ecosystems and protect, enhance and restore water bodies to ‘good’ status.”

A PINS Advice Note on National Infrastructure Planning specifies “the information that the Inspectorate considers an Applicant must provide with their NSIP application in order

to clearly demonstrate that the WFD and the 2017 Regulations have been appropriately considered.”

PINS Advice Note on National Infrastructure Planning:

## **LOCAL TO PORTLAND**

---

### **Defra: Chesil Beach & Stennis Ledges - Marine Conservation Zone (MCZ)**

Map & designation orders in 2013, 2016 & 2019:

<https://www.gov.uk/government/publications/marine-conservation-zone-2013-designation-chesil-beach-and-stennis-ledges>

“MCZs protect typical, rare or declining habitats and species found in our seas.”

“The Chesil Beach and Stennis Ledges MCZ provides a wide range of seabed habitats that support a great variety of species. The rocky habitats are rich in plants and animals such as sponges, sea squirts, bivalve molluscs (such as mussels and native oysters), and also support commercially important crustaceans (such as lobsters and crabs).”

---

### **Nature Conservation Review for the proposed ‘Portland Harbour Fishery Order 2019’**

version 30th May 2019:

[https://www.portland-port.co.uk/public/files/2E\\_%2020190530\\_Annex-E\\_NatConRev11\\_06\\_19\(1\).pdf](https://www.portland-port.co.uk/public/files/2E_%2020190530_Annex-E_NatConRev11_06_19(1).pdf)

Section 4, ‘Habitats of Principal Importance / Priority Habitat’.

## APPENDIX B: QUANTITY OF PARTICULATE MATTER

If particles were alive, those that did not dissolve in ambient water would resemble individual micro-plankton ('plankters') in size and in drifting with tides and currents.

Understandably, the Environmental Statement is primarily concerned with impacts on land and especially with potential impacts on human health. Yet by looking at the conservatively modelled release rates of particulate pollutants, we can, to a limited extent, also consider coastal and marine impacts.

*Figure 3: Stack emissions data for Fine Particulate matter (PM)  
(extracted from CD1.37e, PPL's ES Technical Appendix D: Air quality (part 2 of 3), Appendix 2: Process Emissions Modelling, p.17)*

Pollutant	Concentration (mg/Nm <sup>3</sup> )	Release rate (g/s)		
		Daily or periodic	Half-hourly	Daily or periodic
...				
Fine particulate matter (PM) <sup>2</sup>	5	30	0.195	1.172
...				

Footnote (2). in source: "As a worst case it has been assumed that the entire PM emissions consist of either PM<sub>10</sub> or PM<sub>2.5</sub> for comparison with the relevant AQALs."

Let us consider only the 'daily or periodic' figure of 0.195 grammes per second. For a yearly quantity, assuming 24-hour daily constant operation for 11 months of each year, the quantity would be around:

$$0.195 \text{ g} \times 60 \text{ seconds} \times 60 \text{ minutes} \times 8,000 \text{ hours}^1 = 5,616,000 \text{ g}$$

To the nearest 100 kg, that's 5.6 tonnes in each year of operation. We could multiply that quantity by 25 or 30 for a lifetime estimator the facility, yet an annual quantity may be more useful to consider.

The particulate emissions and secondary particulates formed in the plume consist of a cocktail, so to speak, of materials. They may be seen and measured via an electron microscope. However if the composition is known, the masses of individual particles can be estimated. So may their surface areas, which is far higher in a collection of finer particles than in a single particle of the same total mass.

Just for illustration, let us suppose that ultra fine particles have a mean mass of say 10 ng (billionths of a gramme), less than that of a single particle of finely ground flour. Also let us assume that on immersion in seawater or brine, all larger particles<sup>2</sup> disaggregate into ultra fine particles of size PM<sub>0.1</sub>. For instance on this basis a single fine particle of maximum size PM<sub>10</sub> might generate around 10,000 ultrafine particles of maximum size PM<sub>0.1</sub>.<sup>3</sup>

The finer the particles, the more effectively they can penetrate living tissues of vascular<sup>4</sup> organisms such as those of wildlife, with potentially harmful effects; and adhere to the surfaces of non-vascular organisms. Also the higher surface-to-

---

<sup>1</sup> from CD1.22 Planning Statement.pdf, page 18, Operations, para. 3.4, "It is estimated that the ERF will operate for an average of 8,000 hours per year over the operational lifetime of the facility."

<sup>2</sup> This disregards soluble compounds since other particles may have formed since emission.

<sup>3</sup> By dividing the mass of the larger particle by the mass of the smaller particle: 1 µg = 1,000 ng; so 10 µg = 10,000 ng.

<sup>4</sup> Vascular: "having vessels that conduct and circulate liquids, such as blood, lymph, or sap." ([www.dictionary.com](http://www.dictionary.com))



mass ratios than for larger particles expose the ultra fine particles to physical and chemical processes and hence makes them far more reactive than larger particles.

Now we can consider the annual rate of particulate emissions among the process emissions (6,150 kg, above) and make a working assumption that some two thirds of it settles on the sea and lagoon surfaces around the Isle of Portland; the remaining one third being deposited on land in and around The Verne and on the mainland, with limited direct impact on coastal and marine wildlife.

In this scenario , the two thirds (around 4,100 kg in a year) that would be deposited on water surfaces would be disaggregated and dispersed.<sup>5</sup> The number of ultrafine particles that would settle in the seas and lagoon would (on the illustrative assumptions noted above) be  $4.1 \text{ kg} / 10 \text{ ng} = 41 \times 10^9$ , i.e. around 41 billion particles. That is a truer and more effective indication of the particulate matter that is dispersed than is its total mass or mass per cubic meter in the atmosphere.

After settling on the sea's surface or lagoon, the particulate matter enters the water column, and some may descend to the seabed; these together are the living 'larder', so to speak, of food supplies for most marine wildlife. Likewise, deposition on shores and rocks would be taken up by precipitation and by daily and seasonal tides and stormwaters.

---

<sup>5</sup> A proportion of the particles that were emitted or (re-)formed in the plume would gather water from airborne vapour (by accretion or hygroscopically) by the time they settled on seawater or a briny surface; but we can ignore the mass of the gathered water since it was not estimated in the dry mass of particulates emitted from the stack.

## APPENDIX C: EXCLUSIONS FROM MY TOPIC

The topic of this statement is a matter of Land-Based Marine Pollution (LBMP). However the UK Government seldom uses this term, and then usually in regard to studies of faraway oceanic areas. I do not address, nor imply, potential harms to human health or activities; nor inland effects nor pelagic oceanic impacts; nor maritime matters of shipping, cruising or naval operations; nor those of ships' engines and propellers while arriving, departing or docked; nor fugitive dust arising during construction or during loading and unloading of trucks and ships; nor plastic nurdles and micro-particulates on shore and in the sea.

I do not consider impacts on climate change from 'greenhouse' gas emissions (GHG). Also I do not consider impacts on airborne plankton ('aeroplankton') since that topic may not yet be well researched and understood.

I indicate potentials for, yet I am not seeking to identify, specific harms to habitats that would result from accumulation and re-concentration of particulate substances from the proposed facility and its related transport. That would be a significant modelling exercise for the Appellant to demonstrate and as far I am concerned it has not been achieved in the proposal.

The potential impacts that I consider are those on wildlife in the marine and coastal habitats, so I do not consider the coastal World Heritage Site in terms of its geologically based Outstanding Universal value. I specifically do not consider impacts on human health and wellbeing since these are not based primarily within the coastal and marine habitats, perhaps in a narrow sense of being below the spring high tides mark.

This objection concerns particulate emissions from the facility's chimney stack and - to a lesser extent - from the tyres and brakes of freight vehicles. I do not express any view as to harms arising directly from the gaseous and vaporous components either of the proposed facility or of the consequent traffic.

Here 'directly' refers to the fact that the gases and vapours are involved in the harms delivered to sensitive habitats. It also refers to my considering only the impacts from deposition on the coastal and marine surfaces, not run-off from inland areas nor emissions whilst airborne. Neither do I take account of particulate emissions from shipping, whether in terms of cargo handling or engine exhausts.

## APPENDIX D: RESPONSIBLE AGENCIES

Is this concern with coastal and marine harms not just a matter of Environmental Regulation, Permitting and Licensing by appropriate authorities? After all, there's the Environment Agency (EA) for England, with a remit that applies on land and up to three miles off the coastline. Then there are the national agencies with responsibility for safeguarding coastal, inshore and offshore marine areas. Also there are international agencies with marine interests in protected species, habitats, human activities and so forth.

Several of the relevant agencies have submitted evidence to the Consultation and to this Inquiry. Their lack of engagement with issues of re-concentration of particulate matter may be explained by other factors at play, such as shortage of resources and expertise or the uniquely exposed site of the Appellant's proposal. In any case, that lack of coverage should not be taken as evidence of absence of harms to wildlife habitats.

I consider that coastal and marine harms should not be treated as a matter reserved for other authorities and agencies than the Defendant to deal with. My basis for this view is in the National Planning Policy Framework (NPPF), calling for an integrated approach to planning decisions across land/sea boundaries.<sup>6</sup> At an international level, as a party to the OSPAR Convention, the UK is obliged "to take all possible steps to prevent and eliminate pollution of the marine environment ... to protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems and, when practicable, restore those areas that have been damaged." Also, Natural England encourages local authorities to plan proactively for undesignated

---

<sup>6</sup> CD9.01: NPPF 2023, paragraph 170. "In coastal areas, planning policies and decisions should take account of the UK Marine Policy Statement and marine plans. Integrated Coastal Zone Management should be pursued across local authority and land/sea boundaries, to ensure effective alignment of the terrestrial and marine planning regimes."

heritage coasts.<sup>7</sup> A ‘silo’ approach to planning decisions would thus be inappropriate; so all authorities and agencies with responsibilities in coastal and marine areas should adopt an integrated and proactive approach.<sup>8</sup>

As to overall responsibility, the buck has to stop somewhere, so to speak; that was with Dorset Council and is now ultimately with the Secretary of State for Environment, Food and Rural Affairs.

---

<sup>7</sup> Natural England, ‘Heritage coasts: definition, purpose and Natural England's role’ published 6 January 2015: Overview: “Natural England’s role / Natural England supports heritage coasts by:

- advising government on national planning policy and the link between terrestrial and marine spatial planning
- encouraging local authorities to adopt local planning policies to conserve, protect and enhance heritage coasts
- encouraging local authorities to proactively plan management where heritage coasts are outside of those designated landscapes ...”

<https://www.gov.uk/government/publications/heritage-coasts-protecting-undeveloped-coast/heritage-coasts-definition-purpose-and-natural-englands-role>

<sup>8</sup> As specified in the Conservation of Offshore Marine Habitats and Species Regulations 2017 / Co-ordination where more than one competent authority is involved Section 35.—(9).

## APPENDIX E: ABBREVIATIONS

AQAL	Air Quality Assessment Level
AQEG	Air Quality Expert Group % Defra
DC	Dorset Council
Defra	Department for Environment, Food & Rural Affairs
DESNZ	Department for Energy Security & Net Zero
EA	The Environment Agency for England
EIP	Environmental Improvement Plan
ES	Environmental Statement
ERF	Energy Recovery Facility (incinerator)
HGV	heavy goods vehicle
HRA	Habitats Regulations Assessment
LBMP	Land Based Marine Pollution
MCZ	Marine Conservation Zone
MPS	Marine Policy Statement for the UK
MSW	municipal solid waste
ng	a nano gramme (a billionth of a gramme, 10 <sup>-9</sup> )
nm	a nano metre (a billionth of a metre, 10 <sup>-9</sup> )
NPPF	the National Planning Policy Framework
OSPAR	Convention for Protection of Marine Environment of North-East Atlantic
PINS	The Planning Inspectorate for England
PM	particulate matter
PPL	Powerfuel Portland Limited, the Appellant
ROS	reactive oxygen species <sup>9</sup>
SI	Statutory Instrument
sHRA	Shadow Habitats Regulation Assessment
SPWI	Stop Portland Waste Incinerator
TPA	The Portland Trust
UK	United Kingdom of Great Britain and Northern Ireland
UNEP	United Nations Environment Program
WFD	Waste Framework Directive

---

<sup>9</sup> ROS: “In chemistry and biology, reactive oxygen species are highly reactive chemicals formed from diatomic oxygen, water, and hydrogen peroxide. Some prominent ROS are hydroperoxide, superoxide, hydroxyl radical, and singlet oxygen.” and “ROS function as signals, that turn on and off biological functions.” [Wikipedia](#)