

**P-05-785 Suspend Marine Licence 1245ML –
Correspondence from Petitioner to Committee, 09.04.18**

**Postpone the Dump of Hinkley Sediments Campaign: BRIEFING to Senedd
Petitions Committee: April 2018**

The Campaign's original petition to the National Assembly expressed concerns relating to the absence of information about the possible impact/effect of the disposal of up to 300,000 tonnes of radioactively contaminated sediment from Hinkley Point.

These concerns were threefold, and all revolved around the issue of "baseline data" which should have been gathered BEFORE the project was approved:

- 1: the absence of information about the final destination of the radioactively contaminated sediments, post dumping:
- 2: the absence of information about the pre-dumping radioactivity exposures (dose rates) of the general population of the south Wales coastal zone, despite their long term proximity to the marine and atmospheric discharges from the multiple Bristol Channel nuclear sites.
- 3: the absence of information about man-made, Hinkley derived, beta and alpha emitting radio nuclides in the Hinkley sediments (see previous briefings).

NRW have recently submitted documentation, to the Petitions Committee, which they have obtained from CEFAS, in support of the EDF/CEFAS/NRW proposition that studies relating to the fate of sediment disposed of at Cardiff Grounds disposal site raise no concerns about the environmental and impact of the proposed dumping of radioactively contaminated sediments at Cardiff Grounds.

- 1: CEFAS summary of their review of the following papers:

A: Sediment dynamics of the Severn Estuary and Inner Bristol Channel, McLaren et al., 1993

B: Distribution, transport and exchanges of fine sediment, with tidal power implications: Severn Estuary, UK, Kirby, 2010

C: A review of sediment dynamics in the Severn Estuary: Influence of flocculation, Manning et al., 2010

D: The Sediment Regime of the Severn Estuary Literature Review, Phil Cannard (Bristol City Council), 2016

*E: *Sedimentation Processes in the Bristol Channel/Severn Estuary, Dyer, 1984*

*F: *Tidal Lagoon Cardiff: Conceptual Process Model, Tidal Lagoon Power, 2016*

N:B: Copies of the last 2 papers (asterisked) have not been received to date:

The CEFAS Summary Document concludes as follows:

Para 14: CEFAS state that “net transport of sands within the estuary” is “upstream” in the Cardiff sector of the Severn estuary: and that the Cardiff Grounds area is identified as being “in equilibrium” (i.e. the sediments are more likely to remain in the sediment cell)

Para 15: CEFAS state that the “general trend of sediment behaviour within the intertidal area around Cardiff and the shoreline closest to Cardiff Grounds has been identified as one of erosion. Therefore it is unlikely that any sediment leaving the cell would settle in those areas.” Para 16: CEFAS propose that several of the listed studies imply that “sediment within the estuary is highly mobile, with sediment being frequently re-suspended and rarely settling out permanently” and concludes that, as a result any “contamination will be further diluted over time through mixing in the water column”.

Para 17: Finally, due to the high turbidity and tidal forcing of the estuary, it is noted within several of the studies listed above that sediment within the estuary is highly mobile, with sediment being frequently resuspended, and rarely settling out permanently. Therefore, if any sediment disposed of to the area is found to contain contaminants (within acceptable levels for disposal), it is likely that this contamination will be further diluted over time through mixing in the water column.

Campaign comments on the papers submitted by NRW:

“Sediment Dynamics of the Severn Estuary and inner Bristol Channel”:

MacLaren.P. et al': Journal of the Geological Society of London. Vol 150; 1993; pp 589–603

The majority of this 1993 paper principally refers to and discusses the sand resource in the context of its major commercial significance.

However, in the context of fine suspended sediments, the paper does report that the “presence of fine grained material caused the formation of extensive peripheral salt marshes (140 square kms in area) and high suspended sediment concentrations in the water column.” in the inner Bristol Channel and Severn estuary sea area.

Page 601 of the paper identifies the inner Bridgwater Bay, the sub tidal area within Swansea Bay, the area off the River Usk, and the fringing mudflats of the inner Severn Estuary as “major depositional areas”.

Page 590 of the paper reports that “the present state of knowledge is still insufficient to understand fully sediment supply and transport within such a complex system.”

“Distribution, transport and exchanges of fine sediment, with tidal power implications: Severn Estuary, UK,” Kirby, 2010; Marine Pollution Bulletin. Vol 61: 2010: pps 21–36

Although it is focused specifically on the potential impact of a Cardiff/Weston Barrage constructed within the inner Bristol Channel/Severn estuary, this paper has a greater focus on fine suspended sediments than the other papers so far made available.

The paper reports (page 20) that the study and understanding of Bristol Channel sediments is now additionally “complicated by large scale ecosystem collapse due to climate change”.

The paper (page 26) reports that the Newport Deep is a “natural fine sediment sink receiving mud from foreshore erosion and reworked dredge material disposal at Cardiff Grounds” and with reference to the Cardiff Roads (Cardiff Port Approaches) the paper states that “ the fact that it engenders high rates of mud maintenance dredging..... makes it likely that it is a sink similar in many ways to the adjacent Newport Deep”: *N.B. this paper does not reference these statements*

“A Review of Sediment Dynamics in the Severn Estuary: Influence of Flocculation”: Manning AJ et al’: Marine Pollution Bulletin. Vol 61: 2010: pps 37–61

This paper (page 49) concludes that “much of the research and data collection was undertaken several decades ago, hence there is a requirement for further investigation”

The paper then catalogues 8 subject areas where such further investigations are recommended in order to provide better data and permit a more complete understanding of sediment dynamics.

The paper reports that, in the Severn Estuary, 70% of sediments suspended during spring tides settled out during the neap tides and described the Wentlooge Flats (fringing mudflats of Gwent levels) as “accreting”: i.e. areas where fine sediments are deposited.

The paper contains no reference/discussion of the movement of sediments out of the Cardiff Grounds disposal site area

“The Sediment regime of the Severn Estuary: Literature Review”: Bristol City Council: P. Cannard. 29th June 2016. This review reports that Severn Estuary salt marsh and mudflat environments represent “sinks of sediment deposition” (page 9,10)

Also reports that the main sediment sink locations for fine sediments are Newport Deep and Bridgwater Bay, and that “sediment sinks also occur around the estuary’s tributaries including the R. Avon and the R. Usk”

The paper contains no reference/discussion of the movement of sediments out of the Cardiff Grounds disposal site area

Campaign Conclusions on the NRW submission:

The papers submitted by NRW provide very little useful or reliable data about the potential fate of radioactively contaminated sediment emplaced into the sea at the Cardiff Grounds disposal site about 2 miles off shore of Cardiff because:

A: all the papers are Severn Estuary wide in scope and none report any site specific (Cardiff Grounds) data investigations.

B: the main subjects for several papers were commercial issues (sand & aggregate resource, barrage proposal) and fine sediments were of little interest to the research.

C: a 1993 paper stated that “the present state of knowledge is still insufficient to understand fully sediment supply and transport within such a complex system”: a 2010 paper concludes that “much of the research and data collection was undertaken several decades ago, hence there is a requirement for further investigation” : another 2010 paper reports that the study and understanding of Bristol Channel sediments is now additionally “complicated by large scale ecosystem collapse due to climate change”.

D: the campaign agrees with CEFAS that the papers confirm

a: a north and east movement of sediment in the Cardiff sector of the Bristol Channel, *The Campaign notes that this means—from the Cardiff Grounds towards the mudflats to the north east, i.e. Gwent levels/Wentlooge Flats and the estuarine and intertidal mudflats fringing the south Wales coast up to the Wye estuary*

b: that the sediments are more likely to remain in the sediment cell and to circulate throughout the cell ***The campaign notes that this is until deposited in sites such as those listed above***

E: CEFAS state that the “general trend of sediment behaviour within the intertidal area around Cardiff and the shoreline closest to Cardiff Grounds has been identified as one of erosion. Therefore it is unlikely that any sediment leaving the cell would settle in those areas.” ***CEFAS offer no other comment on the end fate of the sediments. The Campaign believes it unlikely that no sediment from the dump site would be deposited in a “Cardiff shoreline”. The Campaign notes the failure of NRW or CEFAS to bring forward any data relate to the fate of sediment dumped at Cardiff Grounds.***

F: the Campaign’s concerns about the end fate of material dumped at Cardiff Grounds have always encompassed those of its supporters, and that the entire south Wales coast is the issue. ***The CEFAS commentary above, is plainly inadequate because it comments only on the intertidal area around Cardiff and offers no information on the potential impact on coastlines to the north and east***

G: CEFAS proposes that any “contamination will be further diluted over time through mixing in the water column”. ***The Campaign disagrees with this claim, because although contamination may be diluted through mixing in the water immediately post dumping period, over the longer term the re-concentration of radioactivity in sediments is always shown in the Bristol Channel, where annual monitoring of sea water and sediments demonstrates that unfiltered sea water always shows lower radioactivity concentrations than fine sediment samples. (see RIFE reports)***

H: from the papers offered by NRW, the Campaign concludes that there is a consensus that extensive inter-tidal sites to the north and east of the Cardiff Grounds (R. Usk, Newport Deep, Cardiff Roads, Wentlooge Flats etc..) are depositional and accretion sites where fine sediments entrained in the Severn

Estuary water column and transported north and east from the Cardiff Grounds may be deposited out. *The campaign notes that NRW, the relevant devolved Welsh Government Agency, appear to not have undertaken any review of, or search for, relevant data and are relying on the UK CEFAS, a Westminster Government agency, for information*

I: *the Campaign concludes that the NRW submission has NOT allayed the concerns expressed in the original petition text and that the submissions have confirmed that radioactively contaminated sediments proposed for dumping at Cardiff Grounds appear most likely to travel north-east towards the mud flat and estuary depositional environments of the east Glamorgan and Gwent coasts where they may deposit out and remain for uncertain time scales. The Campaign notes that had an exhaustive (site and proposal specific) EIS been carried out these issues could have been settled long ago.*

Tim Deere-Jones:

for the Campaign:

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