



**SUMMARY OF INFORMATION REGARDING STUDIES RELATING TO THE FATE OF  
SEDIMENT DISPOSED OF TO CARDIFF GROUNDS DISPOSAL SITE**

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**To: Adam Cooper - NRW (by e-mail)**

1. With reference to the above request for information regarding studies relating to the fate of sediment disposed of at Cardiff Grounds disposal site (LU110), dated 6<sup>th</sup> February 2018, please find my comments below.

**Documents reviewed**

2. Sediment dynamics of the Severn Estuary and inner Bristol Channel, McLaren et al., 1993
3. Distribution, transport and exchanges of fine sediment, with tidal power implications: Severn Estuary, UK, Kirby, 2010
4. A review of sediment dynamics in the Severn Estuary: Influence of flocculation, Manning et al., 2010
5. Sedimentation Processes in the Bristol Channel/Severn Estuary, Dyer, 1984
6. The Sediment Regime of the Severn Estuary Literature Review, Phil Cannard (Bristol City Council), 2016
7. Tidal Lagoon Cardiff: Conceptual Process Model, Tidal Lagoon Power, 2016

**Description of the proposed works**

8. On the 6<sup>th</sup> February, Natural Resource Wales (NRW) contacted Cefas with a query regarding the disposal of sediment at Cardiff Grounds disposal site (LU110), arising from works at Hinkley Power Station.
9. NRW requested that Cefas supply any relevant information on “any studies relating to how the sediments would likely to be dispersed following dumping at the Cardiff Grounds site”
10. The documents listed in points 2 - 7 above have been identified as being relevant to informing how sediments would likely be dispersed around the Cardiff Grounds site. I have summarised the main outcomes of these studies below.
11. In addition, it is expected that an EIA statement will shortly be released by Tidal Lagoon power for the Cardiff Tidal Lagoon project, which should also provide information regarding sediment transport in the area.

**Comments**

12. The Severn estuary, in which the Cardiff Grounds disposal site is located, is widely regarded as a highly turbid estuary that is primarily influenced by tidal forces, with waves having an influence on a more local scale.
13. The estuary is funnel shaped, which causes incoming tidal wave energy to be concentrated, and results in an increased amplitude and high currents upstream.



14. As a result, the general net transport of sands within the estuary is upstream, driven by these strong tidal currents. However, several of the studies observed that there is a split in the estuary, with the eastern part of the estuary being dominated by flood currents, and ebb currents being more prevalent in the western part.
15. Although the net transport may be upstream, it should be noted that the area in the vicinity of the Cardiff Grounds disposal site has been identified as being in equilibrium, meaning that sediment within this area is more likely to remain in the sediment cell, rather than being characterised by erosion or deposition (Figures 1-3)

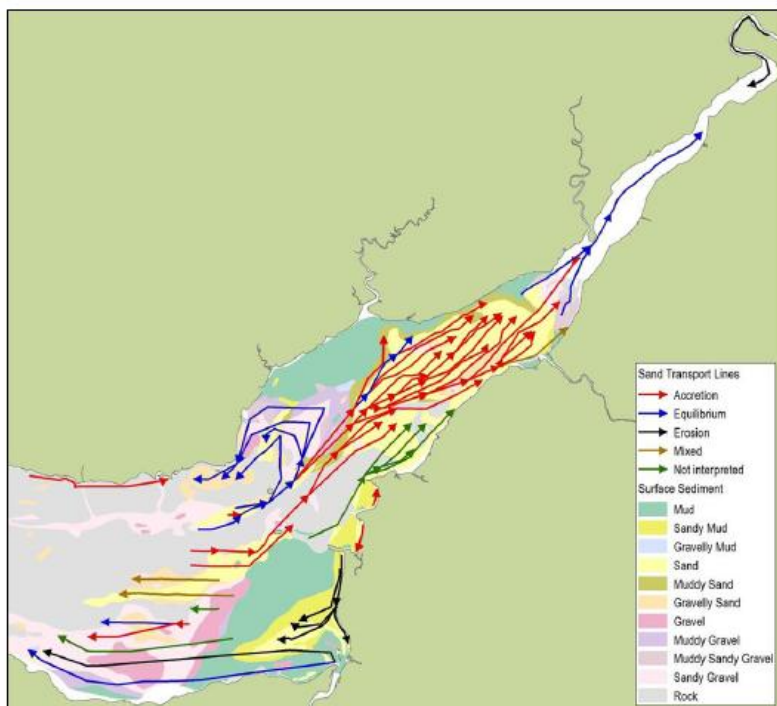


Figure 1. (Taken from Tidal Lagoon Cardiff, 2016). Sand transport lines, deduced from Sediment Trends Analysis

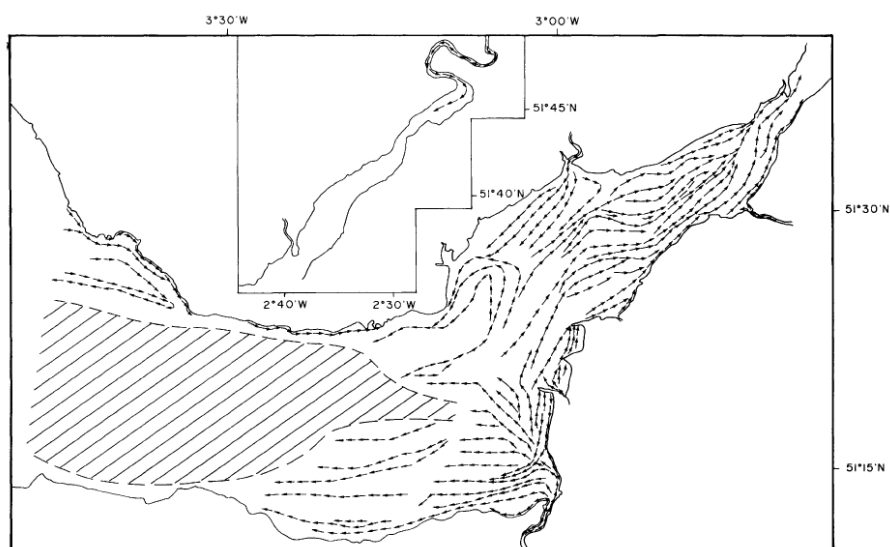


Figure 2. (Taken from McLaren et al., 1993). Patterns of net sediment transport



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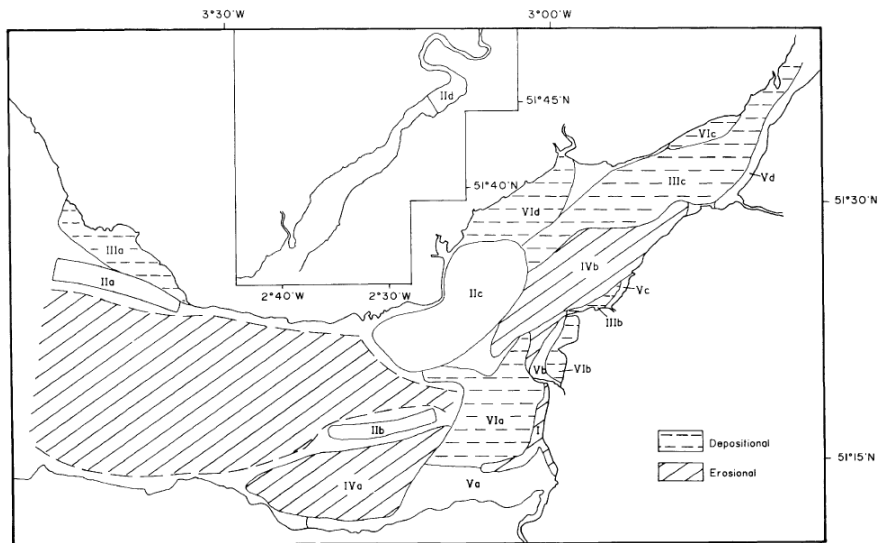


Figure 3. (Taken from McLaren et al., 1993). Sediment transport environments, on the basis of dynamic states.

16. In addition, the general sediment trend 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.
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.

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| Quality Check       | Date       |
|---------------------|------------|
| Jemma-Anne Lonsdale | 20/02/2018 |



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