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Morlais Project

Cumulative and In-Combination Impact Assessment Addendum

Applicant: Menter Môn Morlais Limited

Document Reference: MOR-RHDHV-DOC-0133a (02)

Addendum: Cumulative, Transboundary and In-Combination Impact Assessment

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1. INTRODUCTION

1. Natural Resources Wales (NRW) have requested further information on the Cumulative and In-combination Assessment (CIA) (Chapter 26 of the Environmental Statement (ES)) for the Morlais Tidal Array project following the additional assessments undertaken on the project post submission, in order to clearly state whether the updates have changed the CIA.

2. The following sections provide updates to the relevant topic chapters of the ES following the additional work undertaken on the project in consultation with NRW and other statutory consultees and identifies whether the results change the conclusions drawn within the CIA.

2. CIA ADDENDUM

2.1. CHAPTER 7: METOCEAN AND COASTAL PROCESSES

3. Following the submission of the ES, numerical modelling has been undertaken to provide further evidence to support the assessment. The modelling report was submitted on the 27th March (document reference MOR-HRW-DOC-0001). The modelling results were assessed in relation to the original assessment and the conclusions are presented in a supplementary note, also submitted on 27th March (document reference MOR-RHDHV-DOC-0112). The modelling results support the assessment presented within the ES and as such the conclusions of the project alone assessment in the ES have not changed, the effects of the Project on coastal processes are predicted to be small scale, localised and temporary.

4. Since submission of the Morlais application, the Holyhead Port Expansion project has submitted an addendum, dated 30th September 2020. The cumulative impacts of Morlais and the revised Holyhead Port Expansion on coastal processes have been assessed, as detailed in Appendix 1. The assessment concludes no predicted changes in residual sediment transport and bed level and negligible cumulative impacts on sediment transport. Also, given that the suspended sediment concentrations at Holyhead North are predicted to disperse to within background levels between each disposal event, there would be little potential for cumulative impacts with the Project.

5. In addition, the Applicant has committed to routing cables to avoid the South Stack sand bank feature in order to ensure there will be no impact on its function as part of the coastal processes system. This is discussed further in the Metocean and Physical Processes ES Supplementary Note (document no. MOR/RHDHV/DOC/0111) submitted on 27th March 2020. This aims to mitigate the project alone level impacts and does not alter the worst case scenario cumulative impacts assessed in the ES.

2.1. CHAPTER 8: MARINE WATER AND SEDIMENT QUALITY

6. As described above, there are no predicted significant cumulative impact on suspended sediment concentrations, therefore there have been no changes or additional information that would alter the CIA for this receptor, therefore the CIA presented in ES Chapter 8 is still valid.

2.2. CHAPTER 9: BENTHIC AND INTERTIDAL ECOLOGY

7. As discussed in Section 2.1, the revised cumulative effects on coastal processes conclude a negligible impact, as a worst case scenario. On the basis of these conclusions and the definition of negligible, i.e. 'no discernible change in receptor condition' provided in Table 7-8 of ES Chapter 7, there is no potential for a discernible change in benthic ecology and therefore the cumulative impacts will, at worst be of negligible significance to benthic ecology.

8. In addition, through agreement of the Morlais Outline Biodiversity Enhancement plan (document MOR-RHDHV-DOC-0164) with NRW, impacts on Annex I habitats will be mitigated. The Holyhead Port Expansion project has also committed to avoidance of Annex I habitats during disposal activities and therefore there would not be any cumulative impacts on Annex I habitats.

2.3. CHAPTER 10: FISH AND SHELLFISH ECOLOGY

9. Further information on the impacts of the Morlais project was provided in response to comments received from NRW (MOR-RHDHV-DOC-0114), however this does not change the conclusions of the ES and therefore the CIA presented in ES Chapter 10 is still valid. The negligible changes in coastal processes described above would have no impact on fish ecology.

2.4. CHAPTER 11: MARINE ORNITHOLOGY

10. ES Chapter 11 identifies two potential cumulative impacts; airborne noise and visual disturbance; and collision risk with tidal devices:

2.4.1. Airborne noise and visual disturbance

11. The assessment for the Project alone identifies a potential disturbance impact for guillemot due to airborne noise and visual disturbance during the construction and operation / repowering of the Project. Between zero and four guillemots could be lost due to this impact each year, which would not represent a significant proportion of the local, regional or national population of this species.

12. At the time of writing the Morlais ES no information was available on the Holyhead Port Expansion. The Holyhead ES aAddendum now considers the cumulative impacts on guillemot as a result of Morlais and the Holyhead Port Expansion, concluding that the possibility of a cumulative impact between the Holyhead and Morlais is considered to be low. Mitigation identified for the Holyhead Port Expansion, to create alternative nesting sites for black guillemot, is considered to ensure the potential for cumulative impact with other projects using the harbour, such as Morlais, would be as a worst case scenario, minor adverse and therefore not significant.

2.4.2. Collision risk with tidal devices

13. In order to mitigate potential impacts to marine ornithology, further work on the phased approach to installation has been undertaken since the submission of the ES, including updated collision risk modelling to show the impact of a smaller initial phase of deployment on marine bird species.

This is presented in the Marine Ornithology Collision Risk Modelling Note(document MOR-RHDHV-DOC-0115 (03)). The first phase shall install a number of devices at which no significant impact to species is predicted and is based on the additional collision risk modelling undertaken for marine mammals (discussed below). The results show that the impacts of this initial phase are reduced to have no significant impact on marine bird species and will give the opportunity to monitor and collect data to better inform the potential impact of subsequent phase deployments. As this smaller initial phase is determined to have no significant impact on marine birds and serves to reduce the impacts, the CIA presented in Chapter 11 represents a conservative worst case scenario.

2.5. CHAPTER 12: MARINE MAMMALS

14. ES Chapter 12 identifies the following potential cumulative impacts:

- Underwater noise and disturbance
- Increased collision risk with vessels
- Potential changes in prey availability from habitat loss
- Collision risk with tidal devices
- Potential entanglement with moorings for floating devices

2.5.1. Underwater noise and disturbance

15. Following the submission of the Morlais ES, underwater noise modelling has been undertaken (document MOR/RHDHV/DOC/0116) to further inform the assessment on potential impacts to marine mammals. This assessment is presented in supplementary note MOR-RHDHV-DOC-0117. The findings of the modelling assessment on construction and operational noise sources support the findings of the assessment within the ES with the impacts assessed as negligible/low risk for all species. There were also no changes identified to the CIA and the assessments in the Habitats Regulations Assessment, including the in-combination assessments with other projects.

16. At the time of writing the Morlais ES, no information was available on the Holyhead Port Expansion. The Holyhead ES Addendum now considers the cumulative impacts of underwater noise. As shown in the table below, the cumulative impacts from Temporary Threshold Shift (TTS) are of negligible or minor significance (non-significant). There is no potential for in-combination auditory injury effects (Permanent Threshold Shift (PTS)) for Morlais and Holyhead Port Expansion, as PTS would be mitigated at both projects.

Potential TTS Cumulative Impact	Morlais worst case scenario (based on the Underwater noise modelling note[1])	Morlais worst case scenario (based on ES)		Holyhead Port Expansion worst case scenario	Total cumulative impact
During construction of Morlais and construction of Holyhead Expansion	**Percussive drilling:** 0.00023 harbour porpoise 0.000006 bottlenose dolphin 0.000066 common dolphin 0.0000009 Risso's dolphin 0.000005 minke whale 0.000047 grey seal	**Cable installation during construction:** 2.4 harbour porpoise 0.00006 bottlenose dolphin 0.007 common dolphin 0.0009 Risso's dolphin 0.004 minke whale 0.005 grey seal	**Vessels during construction:** 0.78 harbour porpoise 0.00001 bottlenose dolphin 0.0001 common dolphin 0.00001 Risso's dolphin 0.20 minke whale 0.01 grey seal	**Total:** 1.27 harbour porpoise 0.000006 bottlenose dolphin 0.000065 common dolphin 0.000009 Risso's dolphin 0.0067 minke whale 0.016 grey seal	4.5 harbour porpoise (0.004% of the reference population) 0.00008 bottlenose dolphin (<0.0001% of the reference population) 0.007 common dolphin (<0.0001% of the reference population) 0.0009 Risso's dolphin (<0.0001% of the reference population) 0.2 minke whale (0.0008% of the reference population) 0.03 grey seal (0.0005% of the reference population)
During operation of Morlais and	**Operation of large turbines:**	**Maintenance & Repowering**	**Vessels during operation:**	**Total:** 1.27 harbour porpoise	3.95 harbour porpoise (0.003% of the reference population)

[1] Document MOR-RHDHV-DOC-0117

Potential TTS Cumulative Impact	Morlais worst case scenario (based on the Underwater noise modelling note[1])	Morlais worst case scenario (based on ES)		Holyhead Port Expansion worst case scenario	Total cumulative impact
construction of Holyhead Expansion	0.2 harbour porpoise 0.000006 bottlenose dolphin 0.000066 common dolphin 0.000009 Risso's dolphin 0.000005 minke whale 0.000047 grey seal	1.7 harbour porpoise 0.00006 bottlenose dolphin 0.0007 common dolphin 0.00009 Risso's dolphin 0.45 minke whale 0.07 grey seal	0.78 harbour porpoise 0.00001 bottlenose dolphin 0.0001 common dolphin 0.00001 Risso's dolphin 0.20 minke whale 0.01 grey seal	0.000006 bottlenose dolphin 0.000065 common dolphin 0.000009 Risso's dolphin 0.0067 minke whale 0.016 grey seal	0.00008 bottlenose dolphin (<0.0001% of the reference population) 0.0009 common dolphin (<0.0001% of the reference population) 0.0001 Risso's dolphin (<0.0001% of the reference population) 0.65 minke whale (0.003% of the reference population) 0.09 grey seal (0.002% of the reference population)

2.5.2. Increased collision risk with vessels

17. The worst-case scenario for the potential increased risk of collision as a result of construction activities of Morlais and Holyhead Port Expansion for each marine mammal species is as follows:

Morlais worst case scenario	Holyhead Port Expansion worst case scenario	Total Cumulative Impact
1.18 harbour porpoise. 0.031 bottlenose dolphin. 0.336 common dolphin. 0.047 Risso's dolphin. 0.027 minke whale. 0.237 grey seal.	8.78 harbour porpoise 0.07 bottlenose dolphin 0.75 common dolphin 0.11 Risso's dolphin 0.06 minke whale 0.41 grey seal	9.96 harbour porpoise (0.01% reference population). 0.1 bottlenose dolphin (0.025% reference population). 1.09 common dolphin (0.002% reference population). 0.16 Risso's dolphin (0.002% reference population). 0.03 minke whale (0.0001% reference population). 0.65 grey seal (0.01% of reference population).

33. This results in a negligible magnitude for minke whale, low for common dolphin and Risso's dolphin, and medium for harbour porpoise, bottlenose dolphin and grey seal, and combined with a sensitivity of low or medium (for bottlenose dolphin only) results in a cumulative impact of negligible to minor adverse (not significant) for all species.

2.5.3. Potential changes in prey availability from habitat loss

Due to the very localised nature of impacts on prey and therefore the low magnitude of impact from both projects, it is considered unlikely that there would be any potential for significant impact as a result of changes to marine mammal prey availability. Therefore, the overall impact significance for Morlais and Holyhead Port Expansion cumulatively is considered to be minor at worst (not significant).

2.5.4. Collision risk with tidal devices

34. Additional collision risk modelling was also undertaken and is presented in supplementary note MOR-RHDHV-DOC-0118. As with Marine Ornithology, this presents further assessment of the collision risk associated with a smaller initial deployment phase, determining the deployment

which would impact less than 0.7 bottlenose dolphin per year, and updated the modelling for all species to take into account a possible scenario of 620 devices. The collision risk model concluded that in order to impact less than 0.7 bottlenose dolphin the first phase would have a maximum output of 12MW or comprise a maximum of 28 devices. The assessment of a 620-device scenario shows that the impact on marine mammals is the same as for the maximum 240MW scenario presented in the ES. An updated CIA is presented within the supplementary note which confirms that the potential cumulative impacts remain the same as that presented in the ES, i.e. not significant.

2.5.5. Potential entanglement with moorings for floating devices

35. There are no changes to entanglement risk for Morlais alone or cumulatively with other projects.

2.6. CHAPTER 13: OFFSHORE ARCHAEOLOGY AND CULTURAL HERITAGE

36. There have been no changes or additional information that would alter the CIA for this receptor, therefore the CIA presented in ES Chapter 13 is still valid.

2.7. CHAPTER 14: COMMERCIAL FISHERIES

37. There have been no changes or additional information that would alter the CIA for this receptor, therefore the CIA presented in ES Chapter 14 is still valid.

2.8. CHAPTER 15: SHIPPING AND NAVIGATION

38. The areas have been revised where only submerged tidal devices with a minimum under keel clearance (UKC) of 8m and those with 20m UKC can be deployed, thereby increasing the area available for passage for small vessels. This change is reflected in the updated ES Volume II Chapter 4 Figures (Figures 4.1 to 4.5) submitted on 27 March 2020. There is no change to the overall boundary of the MDZ and therefore this does not alter the CIA presented in ES Chapter 15.

2.9. CHAPTER 16: MARINE INFRASTRUCTURE AND OTHER USERS

39. There have been no changes or additional information that would alter the CIA for this receptor, therefore the CIA presented in ES Chapter 16 is still valid.

2.10. CHAPTER 17: WATER RESOURCES AND FLOOD RISK

40. There have been no changes or additional information that would alter the CIA for this receptor, therefore the CIA presented in ES Chapter 17 is still valid.

2.11. CHAPTER 18: GROUND CONDITIONS AND CONTAMINATION

41. There have been no changes or additional information that would alter the CIA for this receptor, therefore the CIA presented in ES Chapter 18 is still valid.

2.12. CHAPTER 19: ONSHORE ECOLOGY

42. Since the submission of the ES further clarification has been provided on the potential construction methodologies for the cable landfall and installation and the potential impacts on terrestrial ecology. This is presented in supplementary note MOR-RHDHV-DOC-0110 (04). The preferred option, HDD, is assessed to have no significant impact on designated terrestrial habitats during construction, operation or decommissioning activities, however additional mitigation is presented to further protect sensitive habitats. The secondary option of trenching is also assessed and, with mitigation, is concluded to have no significant effect on designated habitats. It is also concluded that an adverse effect on site integrity of the Glannau Ynys Gybi/Holy Island Coast SAC can be ruled out with mitigation. As this mitigation serves to reduce the impacts, the CIA presented in Chapter 19 represents a conservative worst case scenario.

43. Further information was also provided for onshore ornithology in response to comments received from NRW on the ES. The further assessment did not change the conclusions of the ES and therefore there is no change to the CIA with regards to onshore ornithology.

2.13. CHAPTER 20: ONSHORE ARCHAEOLOGY

44. Additional assessment was undertaken on the potential impact of the offshore development on the onshore archaeological assets (MOR-RHDHV-DOC-0125) as well as the provision of further information (MOR-RHDHV-DOC-0122) in response to comments received from NRW. Further information provided does not change the conclusions of the ES and therefore the findings of the CIA still stand. With regards to the updated settings assessment it is considered that no projects are identified within the vicinity of the offshore development that would give rise to a cumulative impact on setting.

2.14. CHAPTER 21: NOISE AND VIBRATION

45. Further information was provided in document MOR-RHDHV-DOC-0109 in order to assess the potential impact of an additional 24 two-way HGV movements per day to the landfall substation during construction. The assessment concluded that these additional movements would not change the conclusions of the Noise and Vibration assessment and therefore there is also no change to the conclusions of the CIA.

2.15. CHAPTER 22: AIR QUALITY

46. As above, document MOR-RHDHV-DOC-0109 considers the potential impact of an additional 24 two-way HGV movements per day to the landfall substation during construction. The assessment concluded that these additional movements would not change the conclusions of the Air Quality assessment and therefore there is also no change to the conclusions of the CIA.

47. Supplementary information on Air Quality (document reference MMC188 MOR-RHDHV-DOC-0148) was provided in September 2020 in response to comments from NRW which requested further evidence as to why an in-combination air quality assessment is not considered necessary. This concludes that:

- Impacts from vessel emissions at landside receptors are expected to be negligible; therefore no significant in-combination impact are predicted in areas which would also experience emissions from road traffic.
- The in-combination impact of traffic flows on air quality were found to be sufficiently low in magnitude as to not require further detailed assessment. Emissions from other sources are not anticipated to have a significant in-combination impact at ecological receptors.

2.16. CHAPTER 23: TRAFFIC AND TRANSPORT

48. As above, document MOR-RHDHV-DOC-0109 considers the potential impact of an additional 24 two-way HGV movements per day to the landfall substation during construction. The assessment concluded that these additional movements would not change the conclusions of the Traffic and Transport assessment and therefore there is also no change to the conclusions of the CIA.

2.17. CHAPTER 24: SEASCAPE, LANDSCAPE AND VISUAL IMPACT

49. The Applicant has committed to additional mitigation in order to reduce visual impacts, outlined in document no. MOR/SLR/DOC/0001. As this mitigation serves to reduce the impacts, the CIA presented in Chapter 19 represents a conservative worst case scenario.

2.18. CHAPTER 25: SOCIO-ECONOMICS, TOURISM AND RECREATION

50. There have been no changes or additional information that would alter the CIA for this receptor, therefore the CIA presented in ES Chapter 25 is still valid.

3. SUMMARY

51. This document provides a summary of the implications on the Morlais CIA of additional information provided since the submission of the ES. All cumulative impacts are deemed to be non-significant in EIA terms.

APPENDIX 1 CUMULATIVE IMPACTS WITH HOLYHEAD PORT

1 INTRODUCTION

Following Natural Resources Wales (NRW) review of previously submitted further environmental information and representation received during the Morlais Tidal Array (ORML1938) consultation period, NRW has requested further information under the Marline Licence determination process, as outlined in a Request for Further Information letter dated 14th October 2020. This supplementary note was submitted to the Transport and Work Act Order process and provides an updated cumulative impact assessment for coastal processes based on the following request from NRW:

Further information has recently been submitted in relation to the Holyhead Port Expansion marine licence application (ref; CML1931) and is available on our public register. Additional consideration should be given within the cumulative impact assessment to the potential inter-relationships with the Holyhead Port proposal from changes in hydrodynamics, waves and sediment pathways.

The above request asks for further information on potential cumulative impacts to tidal currents, waves and sediment transport pathways with the Holyhead Port Expansion project. The additional information provided for the Holyhead Port Expansion marine licence application is specific to the sediment transport regime and changes caused by amendments to the dredging and disposal regimes. Hence, the cumulative impact assessment for tidal currents and waves with Holyhead Port Expansion remains unchanged from the originally submitted Morlais Environmental Statement (ES) and any subsequent response to comments sent to NRW. The same applies to the cumulative impact assessment for sediment transport for dredging for Holyhead Port Expansion. In all these cases, the coastal processes impacts due to construction and operation of Holyhead Port Expansion are within Holyhead Harbour and at the proposed port, and are remote from the activities at the Morlais Offshore Development Area. Hence, there will be no overlap of the potential effects to tidal currents, waves and sediment transport.

This supplementary note focusses on the cumulative impact on sediment transport pathways at the Morlais Demonstration Zone (the Project) and disposal of sediment at the Holyhead North disposal site as part of the Holyhead Port Expansion.

2 MORLAIS DEMONSTRATION ZONE SEDIMENT TRANSPORT MODELLING RESULTS

The results of the Project sediment transport modelling by HR Wallingford (document reference MOR-HRW-DOC-0001) and an associated Numerical Modelling Supplementary Note (document reference MOR-RHDHV-DOC-0112) were submitted to NRW dated 27th March 2020 and are reproduced below.

Changes in the sediment transport regime (both bedload sediment transport and suspended sediment transport) will arise as an indirect effect, consequent upon changes in the tidal and/or wave regimes caused by tidal devices, their foundations and cable protection. To investigate this issue, numerical modelling has been used to determine the changes in sediment transport rates and the resulting evolution of the sea bed arising from the worst-case scenario (HR Wallingford, (2020).

For the purposes of the impact assessment, the results of the sediment transport modelling are presented as changes to the residual transport of the total load (bedload and suspended load combined) (the average of all the transport over the time of the simulation) (Figure 2.1). The results are also presented as erosion/deposition to show predicted changes in sea bed levels and scaled up to change over a year (Figure 2.2).

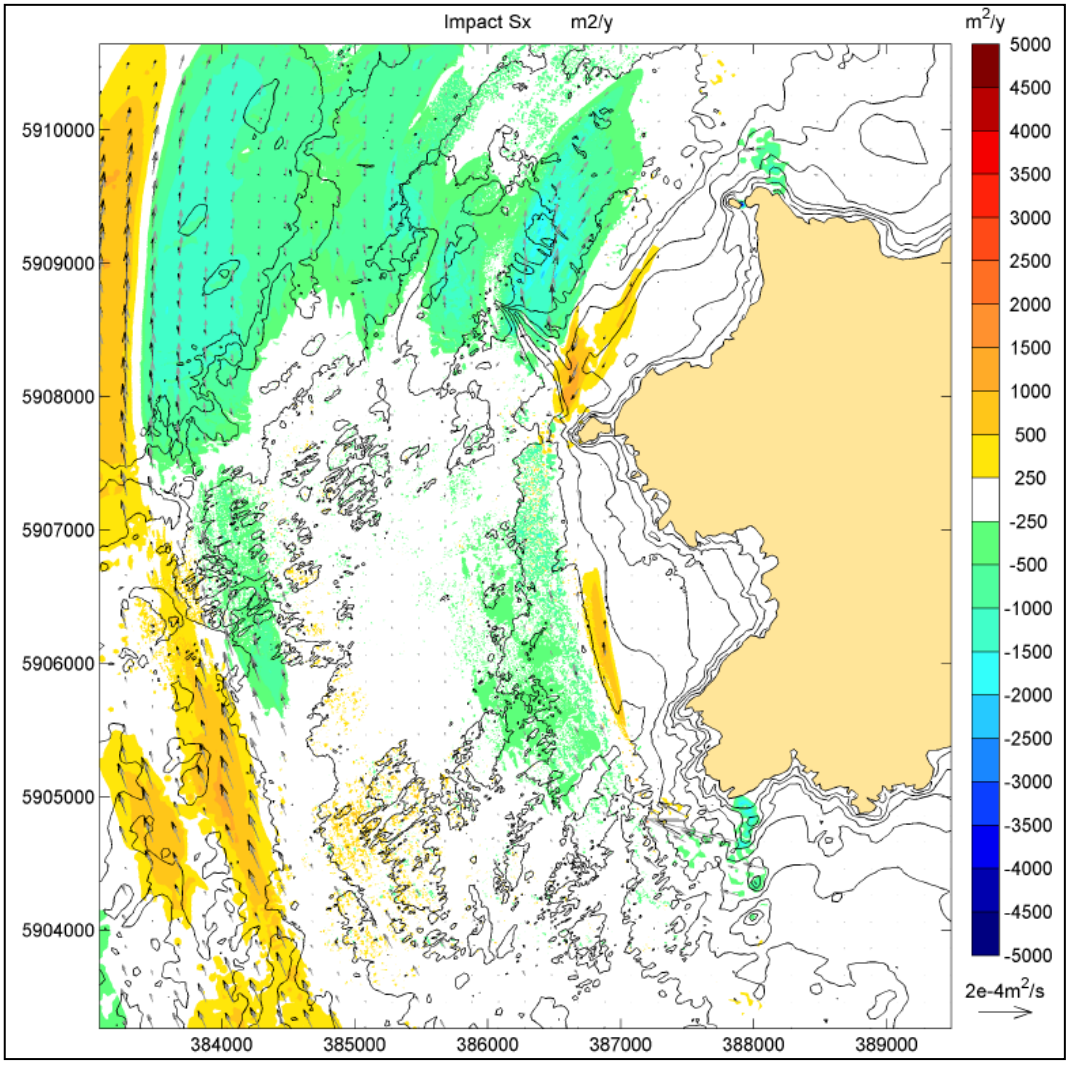

Figure 2.1. Changes in yearly averaged residual sediment transport due to the Project (HR Wallingford, 2020)

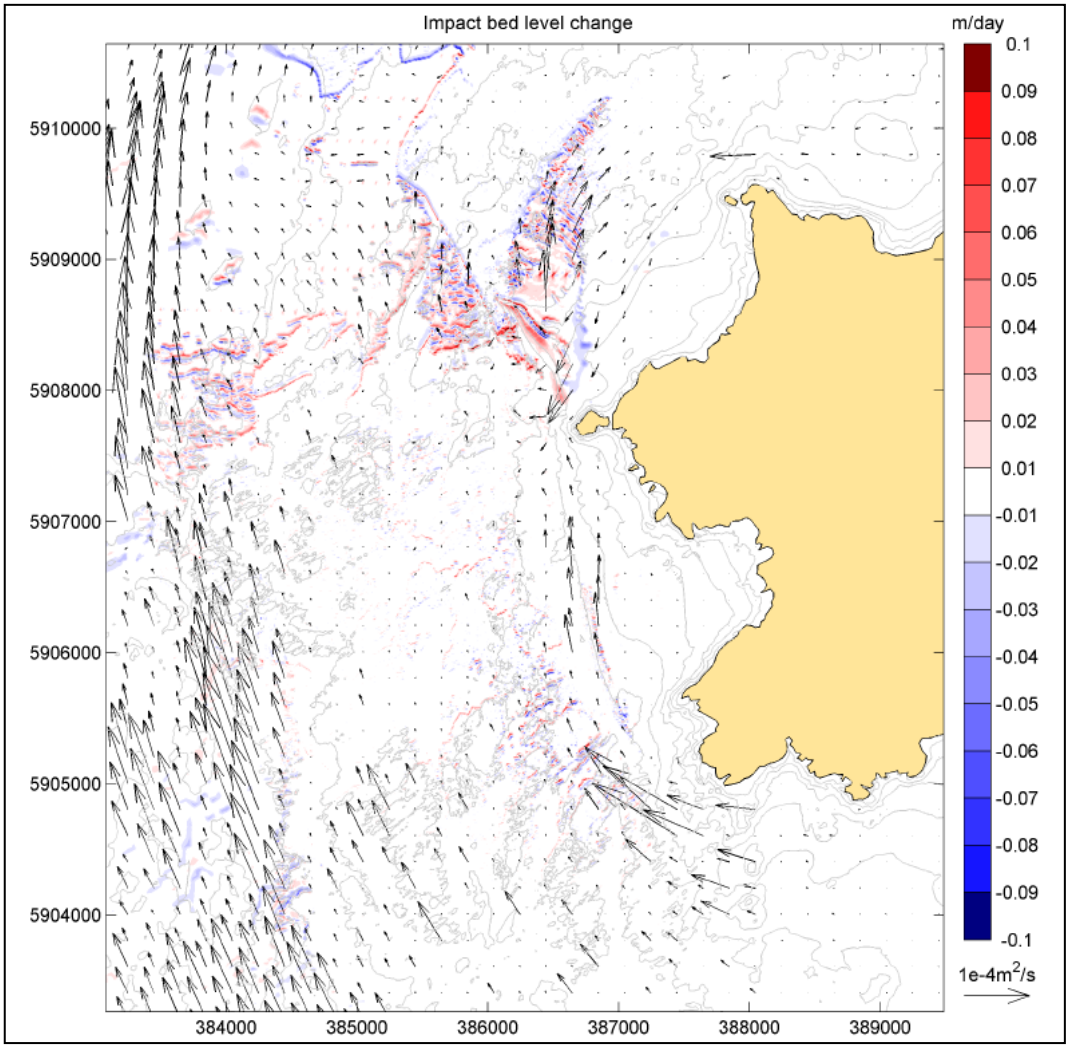

Figure 2.2. Changes in bed level change due to the Project (HR Wallingford, 2020)

Figure 2.1 shows the changes in yearly averaged residual sediment transport due to the Project. Comparing these predictions with the baseline residual transport shows that they are less than 10-20% of the baseline residual transport. The drag of the devices, which would reduce the tidal current velocities in the array results in a predicted reduction in the sediment transport rates. Transport rates over the sand waves offshore from Gogarth Bay are predicted to be 10-20% lower with the devices in place. This means that the migration rates of the sand waves, which is currently about 30m/year (measured using bathymetry comparisons) would reduce by about 5m/year, which would be within the natural variation of the measured migration rates.

Offshore from the array, the predicted flow velocities are higher, and the resulting residual transport rate is also predicted to be higher. An increase in residual transport rate is also predicted to occur north of South Stack at the periphery of Gogarth Bay, and towards South Stack, but there is a predicted reduction in residual transport away from South Stack further offshore. This means that the circulation of sediment to and from South Stack sand bank would change; the residual transport away from the offshore tip is predicted to reduce whilst the return residual transport to the nearshore part of the bank is predicted to increase. This could lead to a reconfiguration of the bank with the offshore tip potentially moving slightly north. However, the volume of sediment that is moving towards the bank (a gain of about 2,000m^3 per spring-neap cycle) is very small compared to the volume of the bank (850,000m^3), and so the size of the bank is unlikely to change significantly in the long-term. This would also be within the natural variation of the position of the bank.

The main bed level changes are predicted to occur north of South Stack in the vicinity of the sand bank and the associated sand waves to its north (Figure 2.2). The bed level changes predict a re-shaping of the bank and sand waves, where they would be adapting their shapes to a form driven by the altered tidal currents. The magnitude

of these changes is like the observed natural changes defined by the comparison of historic bathymetries (HR Wallingford, 2020).

3 HOLYHEAD PORT EXPANSION SEDIMENT TRANSPORT MODELLING RESULTS FOR SEDIMENT DISPOSAL AT HOLYHEAD NORTH

The results of the Holyhead Port Expansion sediment transport modelling using increased volumes of sediment disposal at the Holyhead North disposal site and a reduced disposal time were presented in the Holyhead Port Expansion ES EA Addendum dated 30th September 2020 (Royal HaskoningDHV, 2020) and are reproduced below. These results supersede those in the original ES and are used in this supplementary note to re-assess the cumulative impacts with the Project (Section 4).

Increase in suspended sediment concentrations as a result of disposal activities

Results from the sediment plume dispersion modelling showed that peak suspended sediment concentration values above 300mg/l would occur when the sediment is released from the hopper within a very localised area (Figure 3.1, Figure 3.2 and Figure 3.3). Increased suspended sediment concentrations are predicted to occur predominantly within the area of the disposal site. Predicted maximum suspended sediment concentrations near to the sea bed of up to 50mg/l do extend up to 2km beyond the boundary of the site.

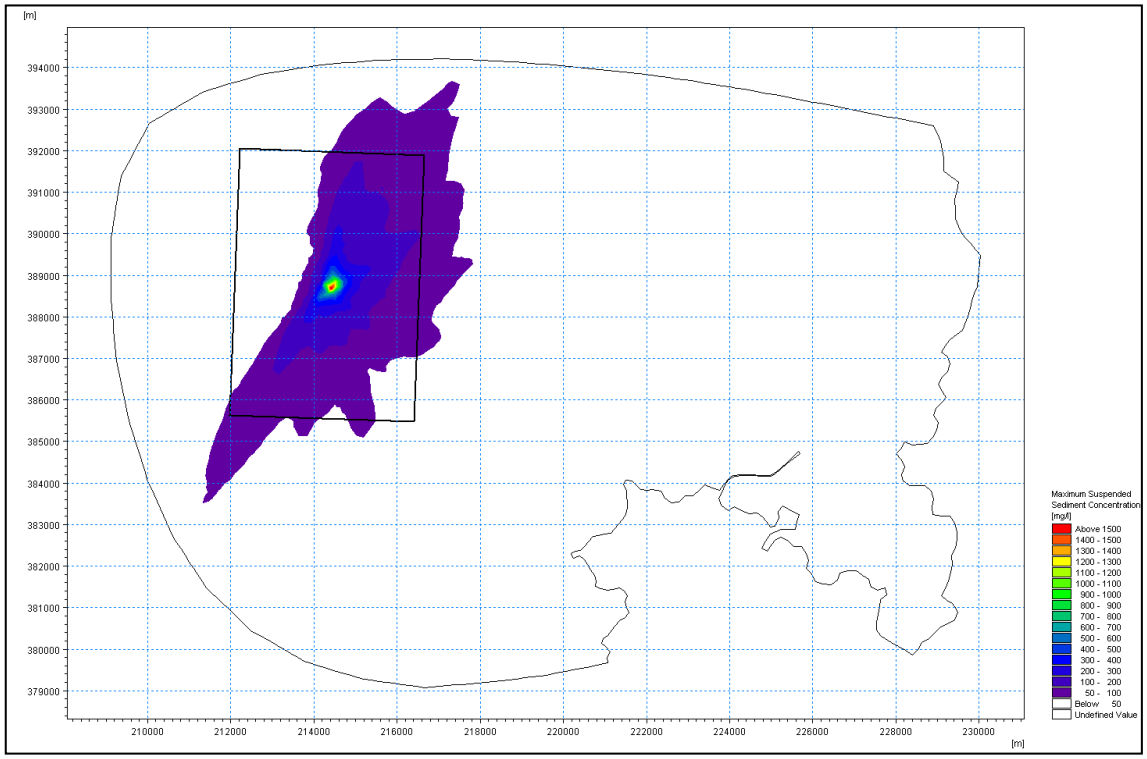

Figure 3.1 Maximum predicted suspended sediment concentrations for the bottom (bed) layer at the offshore disposal site.

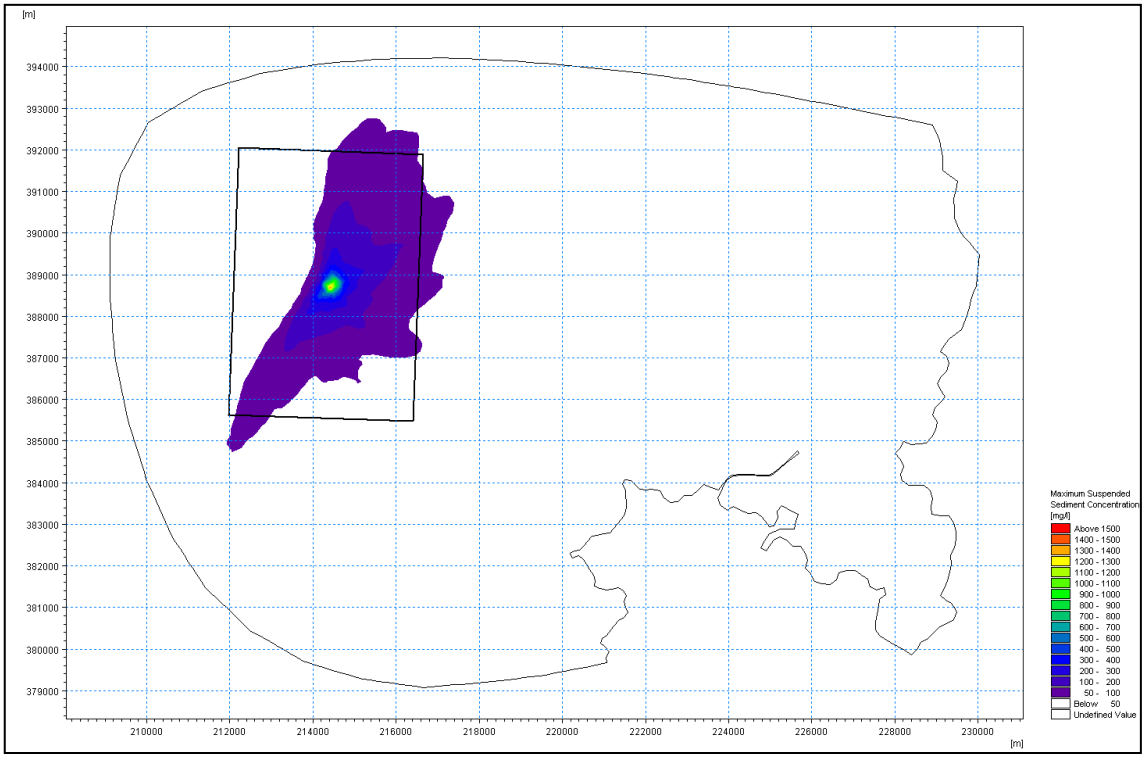

Figure 3.2 Maximum predicted suspended sediment concentrations for the mid layer at the offshore disposal site.

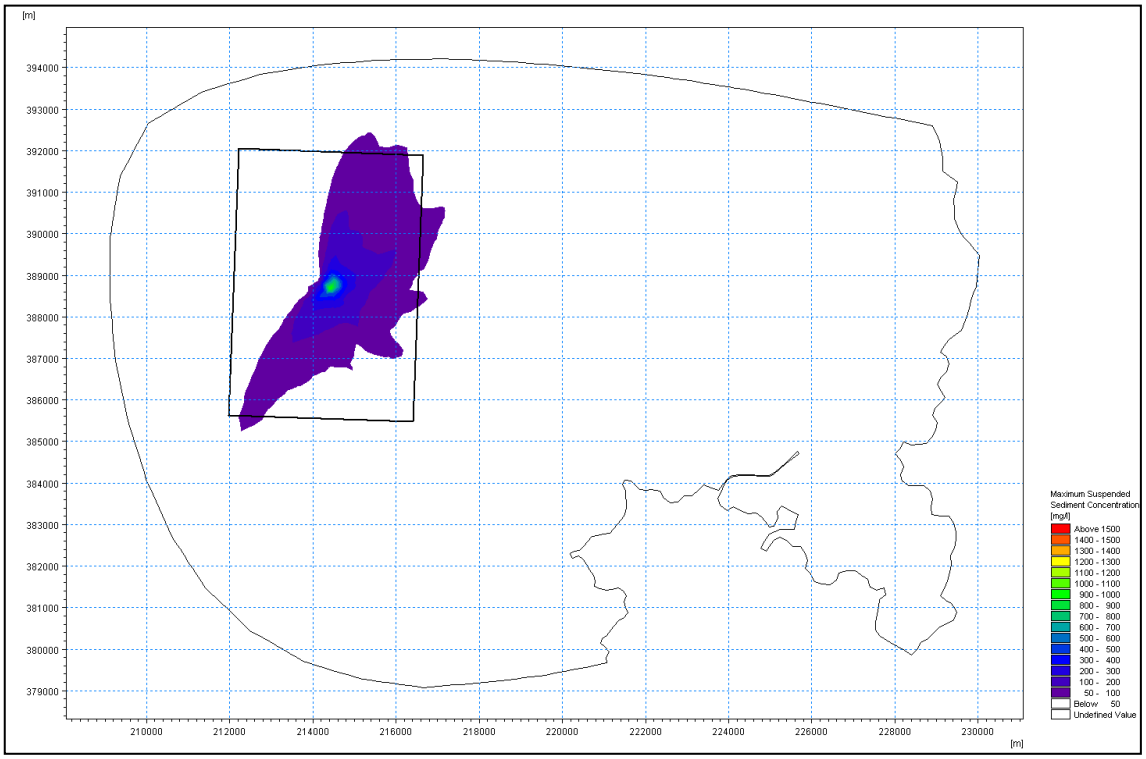

Figure 3.3 Maximum predicted suspended sediment concentrations for the surface layer at the offshore disposal site.

Disposal will occur over a period of approximately 15 weeks and will be non-continuous, and so suspended sediment concentrations are predicted to disperse to within background levels between each disposal event. Time series plots have been produced to illustrate the dissipation of suspended sediment concentrations following the cessation of dredging and disposal activities. These are presented in Figure 3.4 and show that at the disposal site suspended sediment concentrations migrate to the south of the disposal site over time and dissipate to within background levels about 150 minutes after disposal.

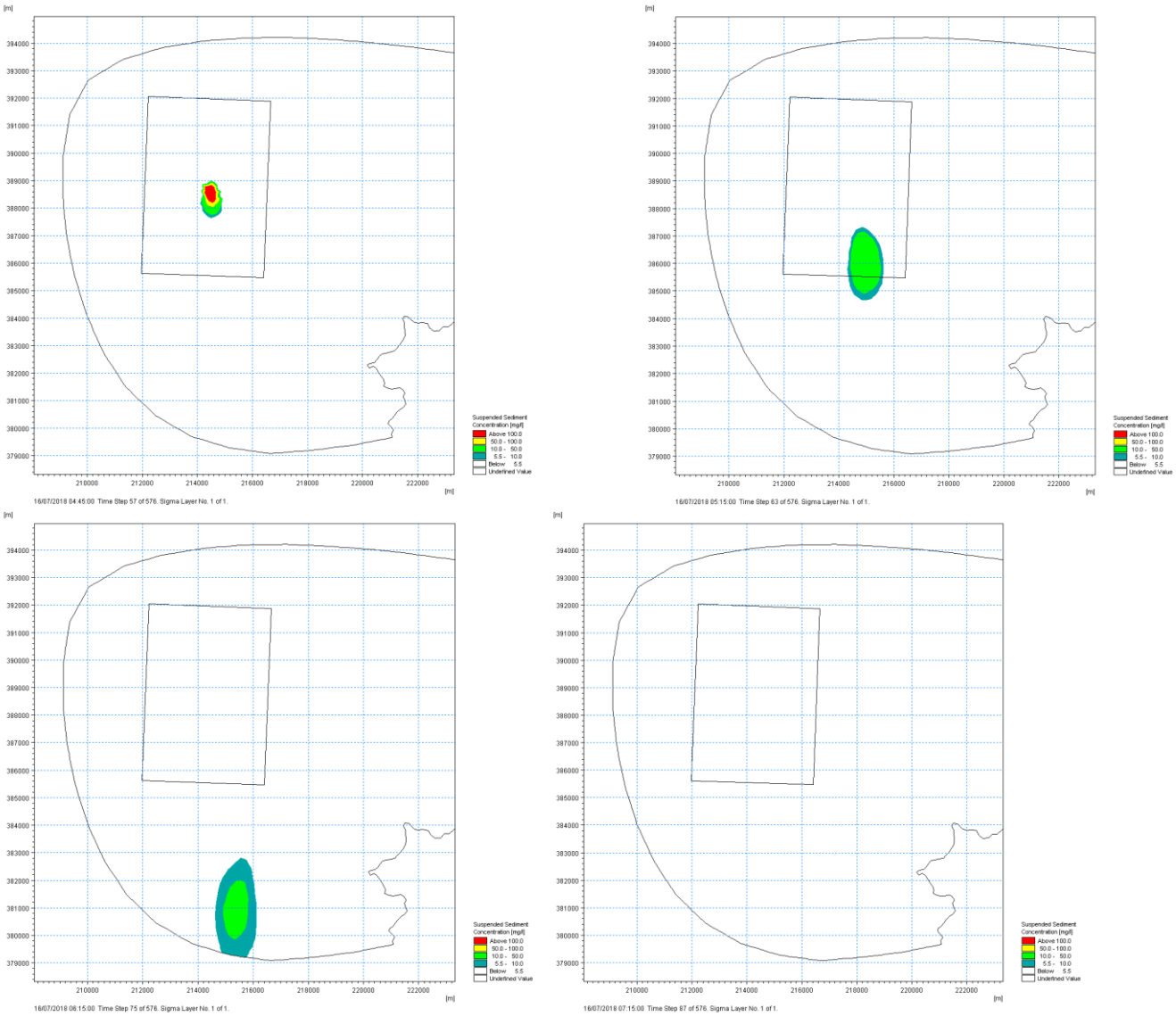

Figure 3.4 Time series plots showing the dissipation of SSC in the mid-layer within Holyhead North once dredging has ceased (top left), 30 mins after last release (top right), 90 minutes after last release (bottom left) and 150 minutes after last release (bottom right)

Changes in sea-bed level due to disposal of dredge arisings at Holyhead North

Figure 3.5 describes the predicted changes in sea-bed elevation at Holyhead North disposal site due to disposal. The results show that any predicted increase in bed thickness is within the boundary of the disposal site. It should be noted that the area predicted to be affected (6.5km^2) is significantly less than that presented in the ES (22km^2). This is a result of the more accurate 3D modelling used, including increased model mesh size at the disposal site and the reduced dredging programme.

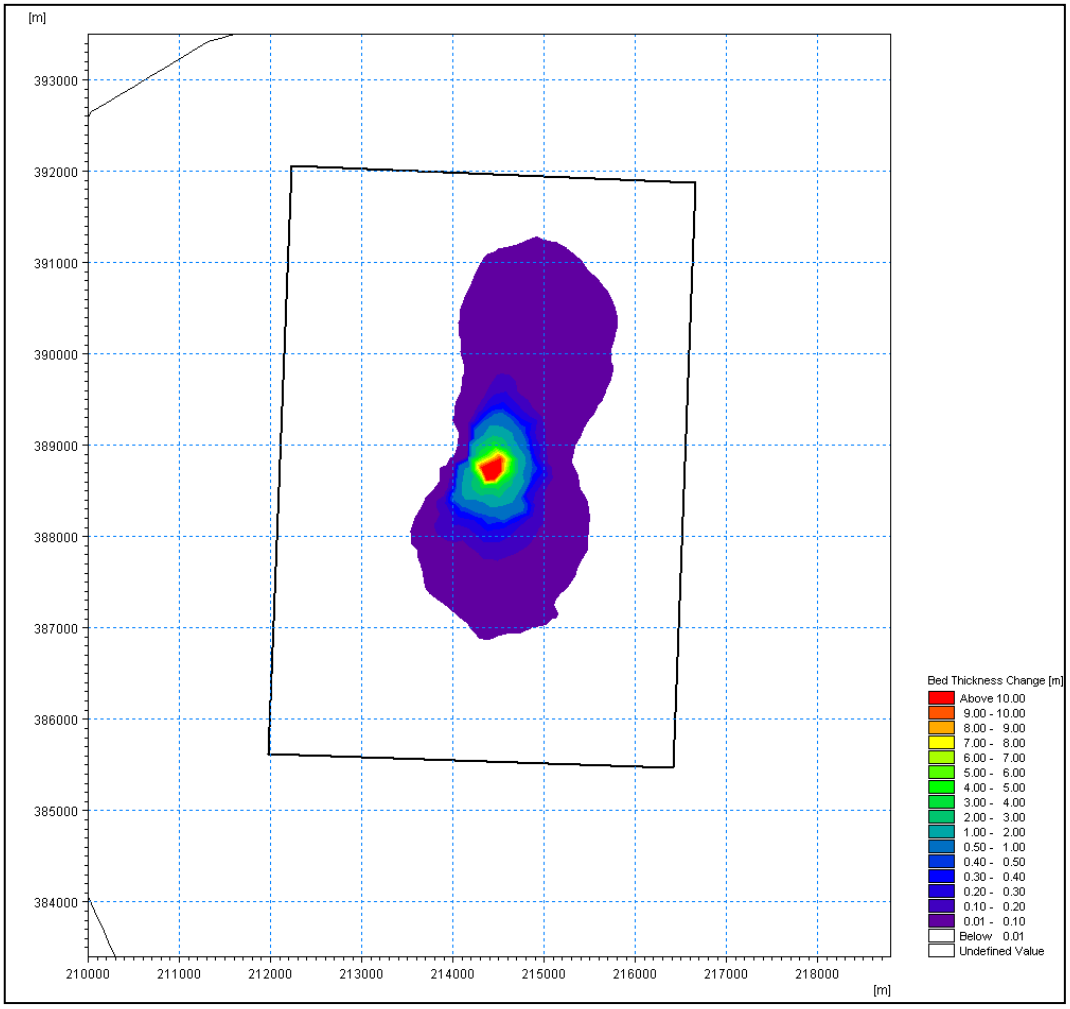

Figure 3.5 Predicted changes in sea bed elevation due to deposition from the plume created by disposal of dredged sediments.

4 CUMULATIVE IMPACTS

According to the Morlais sediment transport modelling of HR Wallingford (2020), the predicted changes in residual sediment transport and bed level at the Project occur within the immediate vicinity of the array area and there are no changes predicted in the wider area (Figure 2.1 and Figure 2.2). The sediment plume dispersion modelling of sediment disposal at the Holyhead North disposal site predicts that the geographical distribution of the plume and particularly the resulting bed level change would be contained almost totally within the boundary of the disposal site (Figure 3.1, Figure 3.2, Figure 3.3 and Figure 3.5). The footprints of the effects of the two activities are adjacent to each other (the Holyhead North footprint of effect is to the west of the Project footprint) with little overlap from a sediment transport perspective. Hence, the sediment transport pathways cumulative impact is **negligible impact** as a worst case scenario.

Also, given that the suspended sediment concentrations at Holyhead North are predicted to disperse to within background levels between each disposal event (Figure 3.4), there would be little potential for cumulative impacts with the Project.

5 REFERENCES

HR Wallingford. 2020. Morlais Demonstration Zone Coastal Processes. HR Wallingford Report DER6261-RT001-R02-00, March 2020.

Royal HaskoningDHV. 2020. Holyhead Port Expansion Environmental Statement Addendum. Report to Stena Line Ports Limited, September 2020. Document reference PB6108-RHD-ZZ-XX-RP-Z-0001.