APPENDIX 21.5

Effect	Receptor and importance	Nature of Effect	Significance	Mitigation & Enhancement Measures	Residual Significance	Cumulative Effect	Significance (and Nature) of Cumulative Effect	Explanation
Construction Phase								
Underwater noise: Potential disturbance, auditory problems, loss of balance and coordination, from pile driving noise. In extreme cases possible mortality near pile driving source. Noise from hover barges.	Epifauna and fish High importance	Temporary Moderate Short-term Direct	Moderate significance Negative	Maintenance of 'noise free' window during times of peak migration.	Low significance Negative	None	-	The text relating to the developments at the Port of Liverpool has been removed because this particular planning application no longer appears on the list and because it has been demonstrated that the effects of the Project will not extend this far and therefore there is no possibility of cumulative effects. ~~The only proposed development which intrudes into the Estuary is development 26 (Port of Liverpool Post Panamax terminal). Approximately 32 km downstream it is too far away to have any direct cumulative effects. Due~~
Underwater noise: Potential disturbance, auditory problems, loss of balance and coordination, from pile driving noise. In	Marine mammals High importance	Temporary Moderate Short-term Direct	Moderate significance Negative	Establishment of a safety zone to protect marine mammals.	Low significance Negative			

Effect	Receptor and importance	Nature of Effect	Significance	Mitigation & Enhancement Measures	Residual Significance	Cumulative Effect	Significance (and Nature) of Cumulative Effect	Explanation
extreme cases possible mortality near pile driving source. Noise from hover barges.								~~to the temporary nature and distance between the two developments further cumulative effects are not considered likely.~~
Release of pollutants: Erosion of sediments/ spillages and leakages of material. Potential release of contaminants within intertidal zone e.g. planings containing tar.	Intertidal and Subtidal habitat High importance	Temporary (poss permanent depending on persistence of pollutant) Low to Moderate Short, medium or long-term (depending on what is released) Direct	Moderate significance Negative	Removal of excavated material and dewater to appropriate disposal sites. Adhere to relevant waste legislation (e.g. Duty of Care Guidance). Store hazardous materials in secure containers to avoid spillage and leakage.	Low significance Negative	Potential decrease in water quality damaging to aquatic organisms	Low Negative (Temporary, Medium term, Direct)	~~The only proposed development which intrudes into the Estuary is development 26 (Port of Liverpool Post Panamax terminal), approximately 32 km downstream. Development 26 is likely to involve disturbance to sediments, however modelling (see Chapter 8: Surface Water Quality) has shown that the effects from construction activities of the Project will not effect the water quality as far downstream as the Liverpool Docks.~~ Other developments, not in the Estuary itself,
Release of pollutants: Potentially direct damage to organisms if	Infauna and Benthic algae High importance	Temporary (poss permanent depending on	Moderate significance Negative	As above	Low significance Negative			

Effect	Receptor and importance	Nature of Effect	Significance	Mitigation & Enhancement Measures	Residual Significance	Cumulative Effect	Significance (and Nature) of Cumulative Effect	Explanation
above Predicted No Effect Concentrations (PNECs) for specific taxa. Bioaccumulation of contaminants along food chain.		persistence of pollutant) Low to Moderate Short, medium or long-term (depending on what is released) Direct and Indirect						may cause additional discharges to the estuary which could have an effect over a larger area. There is therefore potential for a low negative cumulative effect if drainage from other new developments near to the edge of the estuary, ~~such as development 10,~~ caused a cumulative decrease in water quality for aquatic species. The text relating to the developments at the Port of Liverpool has been removed because this particular planning application no longer appears on the list and because it has been demonstrated that the effects of the Project will not extend this far and therefore there is no possibility of cumulative effects.
Release of pollutants: Potentially direct adverse effect on epifauna and fish species (depending on type of pollutant and its concentration in sediments/water column). Damage due to consumption of contaminated prey items and bioaccumulation of	Epifauna and fish High importance	Temporary (poss permanent depending on persistence of pollutant) Low to Moderate Short, medium or long-term (depending on what is released) Direct and Indirect	Moderate significance Negative	As above	Low significance Negative			

Effect	Receptor and importance	Nature of Effect	Significance	Mitigation & Enhancement Measures	Residual Significance	Cumulative Effect	Significance (and Nature) of Cumulative Effect	Explanation
contaminants.								
Habitat loss/disturbance : Construction of tower, piers cofferdams and stone haul road. Direct loss of sediment habitat, tower surfaces would create a small area of new habitat.	Intertidal and Subtidal habitat High importance	Temporary and Permanent Low Short, medium or long-term (i.e. for sediments on which towers were built) Direct	Low significance Negative	None	Low significance Negative	None	-	The text relating to the developments at the Port of Liverpool has been removed because this particular planning application no longer appears on the list and because it has been demonstrated that the effects of the Project will not extend this far and therefore there is no possibility of cumulative effects.~~The only proposed development which intrudes into the Estuary is development 26 (Port of Liverpool Post Panamax terminal), approximately 32 km downstream. Development 26 is likely to involve disturbance to sediments, however modelling (see Chapter 7: Hydrodynamics and Estuarine Processes) has shown that the~~

Effect	Receptor and importance	Nature of Effect	Significance	Mitigation & Enhancement Measures	Residual Significance	Cumulative Effect	Significance (and Nature) of Cumulative Effect	Explanation
								~~effects from construction activities of the Project will not effect sediments that far downstream.~~
Habitat loss/disturbance : Construction of tower, piers cofferdams and stone haul road. Direct loss of sediment habitat, tower surfaces would create a small area of new habitat.	Infauna and Benthic algae High importance	Temporary and Permanent Low Short, medium or long-term (i.e. for sediments on which towers were built) Direct	Low significance Negative	None	Low significance Negative	None	-	No proposed developments will intrude into the saltmarsh. ~~Development 26 is located on previously developed land.~~
Habitat loss/disturbance : Fish can move away from impacted areas and relocate to areas away from the site of construction. If stone haul road construction removes saltmarsh	Epifauna and fish High importance	Temporary and Permanent Low Short, medium and long-term Direct	Low significance for most species but moderate for protected migratory fish. Negative	Ensure adequate space between pilings for fish to pass through.	Low significance Negative	None	-	No proposed developments will intrude into the saltmarsh. ~~Development 26 is located on previously developed land.~~

Effect	Receptor and importance	Nature of Effect	Significance	Mitigation & Enhancement Measures	Residual Significance	Cumulative Effect	Significance (and Nature) of Cumulative Effect	Explanation
scrapes (potentially important habitat) this would decrease availability of potentially important intertidal refuge areas for fish. Cofferdam and pier structures may disorientate and impede salmon migration.								
Habitat loss/disturbance : Infilling of section of the St. Helen's Canal. Fish likely to be impacted. Displacement of organisms and reduction of available habitat for aquatic flora and fauna.	Canal fauna and flora Moderate importance	Temporary Low Short-term Direct	Low significance Negative	None	Low significance Negative	None	-	No proposed developments will intrude into the saltmarsh. Development 26 is located on previously developed land.

Effect	Receptor and importance	Nature of Effect	Significance	Mitigation & Enhancement Measures	Residual Significance	Cumulative Effect	Significance (and Nature) of Cumulative Effect	Explanation
Operational Phase								
Guanotrophy: Potential adverse impact due to increased organic input from roosting birds. Depletion of dissolved oxygen levels in water column due to increased bacterial activity. Potential local reduction in macro invertebrate diversity.	Canal fauna and flora Moderate importance	Permanent Low Long-term Direct & Indirect	Low significance Negative	None	Low significance Negative	None	-	No other proposed developments are likely to result in this effect. Therefore there is no potential for cumulative effects.

Table 21.5. Cumulative effects relating to Aquatic Ecology arising from the Project