

The Lighthouse Green Fuels Order

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Chapter 23: Summary of Significant Effects

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Abbreviations

Abbreviation	In Full / Term
ASU	Air Separation Unit
CHP	Combined Heat and Power
CO ₂	Carbon dioxide
DCO	Development Consent Order
ES	Environmental Statement
GVA	Gross Value Added
km	kilometre
LGF	Lighthouse Green Fuels
OMH	Open Mosaic Habitat
MW	Megawatts
MWe	Megawatts electrical
NH ₃	Ammonia
NO _x	Oxides of Nitrogen
PINS	Planning Inspectorate
RCBC	Redcar and Cleveland Borough Council
SAF	Sustainable Aviation Fuel
SCR	Selective Catalytic reduction
SNCR	Selective Non-Catalytic Reduction
SoS	Secretary of State
SSSI	Site of Special Scientific Interest
STBC	Stockton-on-Tees Borough Council

1 Introduction

1.1 Overview

- 1.1.1 This Chapter of the Environmental Statement (ES) is a summary of Significant Effects as assessed in **Chapters 8-22 (ES Volume I, Application Document Ref. 6.1)**. For each topic, it identifies those adverse and beneficial environmental effects that are considered to be significant before mitigation (i.e. moderate and major effects), and their associated effect when considered together with identified mitigation measures (i.e. residual effects).
- 1.1.2 Table 1.1 includes all the environmental effects of the Proposed Development that have been identified in the ES to be moderate or major adverse or beneficial (i.e. significant), following implementation of the embedded mitigation or impact avoidance measures, before further mitigation is applied (as detailed in **Chapters 8-22 (ES Volume I, Application Document Ref. 6.1)**). Residual effects after further mitigation are also summarised.
- 1.1.3 For each topic, the reasonable worst-case parameters are assessed, including the construction programme scenario and design parameters. Further details on the maximum design parameters are set out in **Chapter 4: Proposed Development (ES Volume I, Application Document Ref. 6.1)**. The specific worst-case for each assessment is described in **Chapters 8-21 (ES Volume I, Application Document Ref. 6.1)** as appropriate. Effects have been assessed for the construction, operation and, where relevant decommissioning scenarios.
- 1.1.4 As outlined in **Chapter 2: Assessment Methodology (ES Volume I, Application Document Ref. 6.1)**, for the purposes of this ES an effect is considered to be 'significant' if it is assessed to be moderate (adverse or beneficial) or major (adverse or beneficial). Minor and negligible effects are only referenced in this chapter where a 'significant' (moderate or major) effect has been reduced to a 'not significant' effect following mitigation.

Table 1.1 Summary of likely significant residual effects

Development stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
Chapter 8: Air Quality				
Construction	No significant effects are predicted to occur.			
Operation	No significant effects are predicted to occur.			
Decommissioning	No significant effects are predicted to occur.			
Chapter 9: Noise and Vibration				
Construction	No significant effects are predicted to occur.			
Operation	No significant effects are predicted to occur.			
Decommissioning	No significant effects are predicted to occur.			
Chapter 10: Terrestrial Ecology				
Construction	Teesmouth and Cleveland Coast Special Protection Area (SPA) and Ramsar site: noise and vibration above normal/ acceptable levels may cause the designated species to be excluded from suitable habitats adjacent to the Site or cause them to change their behaviours	Major adverse (significant)	Acoustic screening to be implemented where required (see Figure 10.9: Acoustic Screening (ES Volume II, Application Document Ref. 6.2)) to provide up to 10 dB(A) reduction in construction noise levels by removing line of sight from the	Negligible (not significant)

Development stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
			construction activities to features.	
	Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI): permanent loss of habitat supporting qualifying features (breeding birds and terrestrial invertebrates) and schedule 1 bird species	Major adverse (significant)	Compensatory habitat creation off-site	Negligible (not significant)
	Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI): noise and vibration above normal/ acceptable levels may cause the designated species to be excluded from suitable habitats adjacent to the Site or cause them to change their behaviours	Major adverse (significant)	Acoustic screening implemented where required (see Figure 10.9: Acoustic Screening (ES Volume II, Application Document Ref. 6.2)) to provide up to 10 dB(A) reduction in construction noise levels by removing line of sight from the construction activities to features.	Negligible (not significant)
	Habitats of Principal Importance: permanent/ temporary loss of Habitats of Principal Importance	Moderate adverse (significant)	Creation of compensatory Open Mosaic Habitat (OMH) and reedbed habitats (or equivalent	Negligible (not significant)

Development stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
			habitats that perform a similar function) offsite	
	Other habitats: permanent/ temporary loss of other habitats	Moderate adverse (significant)	Compensatory habitat creation off-site	Negligible (not significant)
	Amphibians: habitat loss/fragmentation due to the Proposed Development leading to a reduction in habitat available for amphibian species	Moderate adverse (significant)	Compensatory habitat creation off-site	Negligible (not significant)
	Breeding birds: habitat loss/ fragmentation due to the Proposed Development leading to a reduction in habitat available for designated species	Major adverse (significant)	Compensatory habitat creation off-site	Negligible (not significant)
	Breeding birds: noise and vibration above normal/acceptable levels may cause designated species to be excluded from suitable habitats adjacent to the Proposed Development or cause them to change their behaviours.	Major adverse (significant)	Acoustic screening implemented where required (see Figure 10.9: Acoustic Screening (ES Volume II, Application Document Ref. 6.2)) to provide up to 10 dB(A) reduction in construction noise levels by removing line of sight from the	Negligible (not significant)

Development stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
			construction activities to features.	
	Wintering birds: noise and vibration above normal/ acceptable levels may cause designated species to be excluded from suitable habitats adjacent to the Proposed Development or cause them to change their behaviours.	Major adverse (significant)	Acoustic screening implemented where required (see Figure 10.9: Acoustic Screening (ES Volume II, Application Document Ref. 6.2)) to provide up to 10 dB(A) reduction in construction noise levels by removing line of sight from the construction activities to features.	Negligible (not significant)
	Terrestrial invertebrates: habitat loss/fragmentation due to the Proposed Development leading to a reduction in habitat available for designated species.	Major adverse (significant)	Compensatory habitat creation off-site Translocation of notable species prior to construction.	Negligible (not significant)
Operation	Teesmouth and Cleveland Coast SPA, Ramsar site, SSSI and National Nature Reserve: degradation of habitats from air pollution.	Major adverse (Significant)	Use of additional abatement (Selective Non-Catalytic Reduction (SNCR)/ Selective Catalytic Reduction (SCR)) to remove oxides of nitrogen	Negligible (not significant)

Development stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
Decommissioning			(NOx) and wet scrubbing to remove ammonia (NH ₃) from process emissions	
	It is assumed that relevant good industry practice mitigation measures would be in place during any decommissioning works (consistent with construction mitigation) in accordance with a Decommissioning Environmental Management Plan (DEMP). Therefore, effects are considered the same as the construction phase. No additional mitigation identified.			
Chapter 11: Freshwater and Marine Ecology				
Construction	Change of subtidal habitats and species from construction works	Moderate adverse (significant)	Alternative dredging methods, avoiding dredging during ebb and spring tides and implementing turbidity monitoring	Minor adverse (not significant)
	Disturbance to marine mammals and fish associated with underwater noise	Moderate adverse (significant) (pinnipeds) Major adverse (significant) (protected fish)	Follow JNCC guidelines such as piling location restrictions, marine mammal visual monitoring, passive acoustic monitoring (PAM), a soft start and other alternative measures as appropriate. Visual monitoring of seals during marine construction works.	Minor adverse (not significant) (pinnipeds and protected fish)
Operation	No significant effects are predicted to occur.			
Decommissioning	No decommissioning activities proposed in relation to the quay infrastructure.			

Development stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
Chapter 12: Water Environment				
Construction	No significant effects are predicted to occur.			
Operation	No significant effects are predicted to occur.			
Decommissioning	No significant effects are predicted to occur.			
Chapter 13: Landscape and Visual Amenity				
Landscape character				
Construction	No significant effects are predicted to occur.			
Operation	No significant effects are predicted to occur.			
Decommissioning	No significant effects are predicted to occur.			
Visual amenity				
Construction	Viewpoint 7 Saltholme RSPB: loss of openness, introduction of large-scale construction works in views.	Moderate adverse (significant)	None – due to the scale of the Proposed Development, additional planting and bunding would not be effective in mitigating visual effects.	Moderate adverse (significant)
Operation	Viewpoint 7 Saltholme RSPB: loss of openness, introduction of new large-scale industrial structures (such as stacks and flare structures, large-scale	Moderate adverse (significant)	None – due to the scale of the Proposed Development, additional planting and bunding would not be	Moderate adverse (significant)

Development stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
	buildings and columns) in views.		effective in mitigating visual effects.	
Decommissioning	Scoped out of Landscape and Visual Amenity assessment.			
Chapter 14: Greenhouse Gas Emissions				
Construction, Operation and Decommissioning (lifecycle assessment)	No significant effects are predicted to occur.			
Chapter 15: Climate Change Resilience				
Construction	No significant effects are predicted to occur.			
Operation	No significant effects are predicted to occur.			
Decommissioning	No significant effects are predicted to occur.			
Chapter 16: Materials and Waste				
Construction	No significant effects are predicted to occur.			
Operation	No significant effects are predicted to occur.			
Decommissioning	No significant effects are predicted to occur.			
Chapter 17: Socioeconomics				
Construction	Generation of employment (direct, indirect and induced)	Moderate beneficial (significant)	N/A	Moderate beneficial (significant)

Development stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
	Generate of Gross Value Added (GVA) (direct, indirect and induced)	Moderate beneficial (significant)	N/A	Moderate beneficial (significant)
	Impact on local businesses	Negligible (not significant)	Local businesses to be included in the supply chain for the construction period of the Proposed Development	Moderate beneficial (significant)
	Impact on health (related to construction phase employment contributing to narrowing health inequalities in a highly deprived area)	Moderate beneficial (significant)	N/A	Moderate beneficial (significant)
Operation	No significant effects are predicted to occur.			
Decommissioning	Scoped out of Socioeconomics assessment.			
Chapter 18: Traffic and Transport				
Construction	No significant effects are predicted to occur.			
Operation	No significant effects are predicted to occur.			
Decommissioning	No significant effects are predicted to occur.			
Chapter 19: Major Accidents and Disasters				
Construction	No significant effects are predicted to occur.			

Development stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
Operation	No significant effects are predicted to occur.			
Decommissioning	No significant effects are predicted to occur.			
Chapter 20: Marine Navigation				
Construction	No significant effects are predicted to occur.			
Operation	No significant effects are predicted to occur.			
Decommissioning	No significant effects are predicted to occur.			
Chapter 21: Geology and Soils				
Construction	No significant effects are predicted to occur.			
Operation	No significant effects are predicted to occur.			
Decommissioning	No significant effects are predicted to occur.			
Chapter 22: Cumulative and Combined Effects				
Construction	Water Environment and Freshwater and Marine Ecology: Potential effect on water quality (suspended sediment) and marine ecological receptors if capital dredging activities for the Proposed Development overlap with capital dredging activities for NSIP3/RCBC41	Moderate adverse (significant) if capital dredging activities overlap	Dredging methodologies to reduce suspended sediment levels as far as practicable	Moderate adverse (significant) if capital dredging activities overlap

Development stage	Environmental Effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation
	(York Potash Harbour Facilities associated with the Woodsmith Project)			
Operation	No significant effects are predicted to occur.			
Decommissioning	No significant effects are predicted to occur.			



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