



AQUIND Limited

AQUIND INTERCONNECTOR

Environmental Statement – Volume 3 – Appendix 2.3 Landfall Constraints Matrix

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations
2009 – Regulation 5(2)(a)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

Document Ref: 6.3.2.3

PINS Ref.: EN020022

AQUIND Limited

AQUIND INTERCONNECTOR

Environmental Statement – Volume 3 –
Appendix 2.3 Landfall Constraints Matrix

PINS REF.: EN020022

DOCUMENT: 6.3.2.3

DATE: 14 NOVEMBER 2019

WSP

WSP House

70 Chancery Lane

London

WC2A 1AF

+44 20 7314 5000

www.wsp.com

DOCUMENT

Document	6.3.2.3 Environmental Statement – Volume 3 – Appendix 2.3 Landfall Constraints Matrix
Revision	001
Document Owner	WSP UK Limited
Prepared By	A. Hardwick
Date	7 November 2019
Approved By	M. McGuckin
Date	7 November 2019

CONTENTS

APPENDIX 2.3 LANDFALL CONSTRAINTS MATRIX

1

APPENDIX 2.3 LANDFALL CONSTRAINTS MATRIX

Key	Detail
Low	Favourable Option (No significant risk)
Moderate	Less Favourable Option (Potential consent, financial or technical risk. Can be overcome / avoided with relative ease)
High	Potential for Selection Elimination (Potentially significant consent risk, timing constraint, financial risk or technical challenge. May require significant time / cost to overcome)
	Showstopper
Instructions: Use Format Painter to select the fill colour above and colour cells depending on suitability of option. The Site Ranking will subsequently be automatically generated for each option.	

Issue	Comments
1	Preliminary for workshop
2	Incorporating workshop comments

Consideration	Lee on the Solent 1	Lee on the Solent 2	Browdown	Eastney	Hayling	East	Selsey
---------------	---------------------	---------------------	----------	---------	---------	------	--------

Engineering	Site	Space for onshore construction e.g. lay down area	High	Moderate	Moderate	Moderate	Low	Showstopper
		Space for offshore installation e.g. marine obstructions, shipping channels	High	High	High	High	Moderate	Low
		Bedrock present at shallow depth to prevent conventional burial	Low	Low	Low	Low	Low	High
		Provisional onshore cable route to substation	Moderate	Moderate	Moderate	Low	Moderate	High

Comments/Criteria ranking explanation/Reference to possible mitigation	Construction (C) / Operation (O)	Information Based on (web, report, site visit)
--	----------------------------------	--

Green: Sufficient for all construction methods including medium HDD (100m by 120m) Orange: Sufficient for small HDD rig and construction (50m by 70m) Red: Sufficient for open cut only (30m by 20m); Black: Deemed not possible	C	Observations from site visit and aerial photos
Green: Sufficient; Orange: Limited; Red: Requires expensive rerouting; Black: Deemed not possible	C	Observations from site visit and admiralty charts
Green: Burial seems easy; Orange: Burial requires special tools; Red: Surface Lay cable protection by concrete mattresses; Black: Area to be avoided	C	Geological maps and site observations
Green: Relatively short route (<20km) with minimal obstructions; Orange: Route has some obstructions can be mitigated by rerouting / HDD; Red: Route has many of obstacles with numerous narrow roads; Black: Impossible to route cable to substation	C	Provisional GIS routing

Access	Roads to site e.g. issues getting plant to site	Green	Green	Green	Green	Green	Green	Yellow	Red	Green: Suitable for all activities inc. cable drum, HDD, JCB; Orange: Constrained for large cable drum, HDD; Red: Not suitable for access for large plant; Black: No access Note East Wittering has possible constrained access, however large HDD may not be required, and is to be considered	C	Site observations, Maps, Aerial photos
	Good access to beach area from adjacent roads	Green	Green	Green	Green	Green	Green	Yellow	Red	Green: Access to the landfall is easy; Orange: Limited access, needs coordination with local land owners; Red: Limited access from land, needs considerations for getting plant from the sea.; Black: No access	C	Site observations, Maps, Aerial photos
Marine Approach	Sufficient water depth for marine operations	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green: Steep coast, good access for the CLV at all states of the tide; Orange: Shallow water during low tides only; Red: Shallow water that will require a separate barge; Black: No access from both land and sea due to shallow water to install cables	C	Admiralty charts
	Good marine access e.g. minimal crossings and obstructions on approach to the landfall	Red	Red	Red	Yellow	Green	Green	Yellow	Yellow	Green: Minimum obstructions; Orange: Some obstructions will require re-routing; Red: Large number of obstructions to be avoided; Black: Impossible to avoid crossings and obstructions in this location	C	Admiralty charts
	Vessel activity on approach to landfall	Red	Red	Red	Yellow	Yellow	Green	Green	Yellow	Green: Minimum vessels; Orange: Some vessel tracks; Red: Large number of vessel tracks on approach to landfall; Black: Impossible to install due to vessel activity	C	MMO vessel tracks and site observations
Soils and Geology	Unexploded ordnance (UXO) any likely hot spots	Yellow	Yellow	Red	Yellow	Yellow	Green	Green	Green	Green: The site has NIL or low probability of occurrence based on a preliminary desktop review risk assessment (including historical data, previous site development information, wartime bombing records etc.); Orange: Potential UXO on site - specialist survey for UXO required; Red: UXO highly likely or confirmed to be present on site - feasible risk mitigation likely to be possible ; Black: UXO highly likely or confirmed to be present on site - feasible risk mitigation not likely to be possible. Browndown is a disused Rifle Range (OS Mapping). Cost Implication and optioneering refinement TBA following desk (and ground) investigations for site options (unless sites are excluded based on other criteria). Mitigation may include pre construction surveys and avoidance or removal of areas containing UXO.	C	Zetica preliminary data search. Desk top study information
Bathymetry and Seabed Processes	Cable exposure	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Green: No risk of exposure Orange: Seabed processes give potential of exposure Red: Minimal sediment, therefore cable exposure possible Black: Cable permanently exposed Mitigation may be around cable route and site selection, installation design and methodology.	O	BGS maps

	Unexploded ordnance (UXO) any likely hot spots								Included within Engineering		
Hydrology	Effects on surface water and groundwater resources								Green: No surface or groundwater resource likely to be affected by runoff, drainage or infiltration from the site. Site has no existing contamination issues. Risk mitigation is feasible. Orange: Minor surface water resource or groundwater aquifer likely to be affected by runoff, drainage or infiltration from the site. Site has no significant existing contamination issues. Risk mitigation is feasible. Red: Major surface water resource or groundwater aquifer likely to be affected by runoff, drainage or infiltration from the site. Site may have existing contamination issues. Risk mitigation is feasible. Black: Major surface water resource or groundwater aquifer likely to be affected by runoff, drainage or infiltration from the site. Site may have significant existing contamination issues. Risk mitigation is not feasible. Mitigation may include avoidance of works in sensitive areas, site management practices to minimise risk of accidental contamination (e.g. through the implementation of a CEMP), or creation of physical barriers (e.g. bunding through design) to ensure contamination does not occur.	C	OS map
	Flood risk to construction or permanent works								Green: Very low to low risk of floods from rivers or sea; Orange: Medium risk of flooding from Rivers and Sea; Red: High risk of flooding from Rivers and Sea; Black: Area is a constant wetland Cost Implication and optioneering refinement TBA following more detailed desk investigations for site options. Flood mitigation is generally based on design following modelling of risk.	O	OS map, Environment agency flood risk map
Air Quality	Human receptor sensitivity								Green: No sensitive receptors at landfall. Site is not in or likely to affect an Air Quality Management Area or other designated site. Orange: Potential sensitive receptors at landfall. Site is likely to affect an Air Quality Management Area or other designated site. Mitigation is feasible and low cost. Red: Sensitive receptors at landfall. Site is likely to affect an Air Quality Management Area or other designated site. Mitigation is feasible at high cost. Black: Sensitive receptors at landfall. Site is likely to affect an Air Quality Management Area or other designated site. Mitigation is not feasible. Cost Implication and optioneering refinement TBA following more detailed desk investigations for site options. Mitigation typically relates to minimisation of emissions through site practices as determined through a CEMP.	C	Landfall visit, AQMA Map
	Plants/habitat								Dust deposition can inhibit photosynthesis in extreme instances, unlikely to be a problem at any of the sites - hence low risk in terms of need for mitigation. Mitigation may include dust suppression measures such as watering roads during construction (through the implementation of a CEMP). Dust from construction only.	C	Desk top study information

Ecology	Designated sites	Orange	Orange	Green	Orange	Orange	Orange	Green	Green: Site is not in or likely to affect a designated site. Orange: Site intersects or is likely to affect a designated site. Permitting and mitigation is feasible and low cost. Red: Site intersects or is likely to affect a designated site. Permitting and mitigation is feasible and high cost. Black: Site intersects or is likely to affect a designated site. Permitting and mitigation is not feasible or attracts prohibitive costs. Mitigation may include avoidance of works in sensitive areas, site management practices to minimise risk of damage to sensitive receptors (e.g. through the implementation of a CEMP), or off-site mitigations. Ecological assessment to be carried out.	C / O	Desk top study information indicating protected area
	Protected species	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green: Site is not in or likely to affect any protected species. Orange: Site is likely to affect one or more protected species. Permitting and mitigation is feasible and of low programme risk and is low cost. Red: Site is likely to affect one or more protected species. Permitting and mitigation is feasible but presents significant programme risk and is higher cost. Black: Site is likely to affect one or more protected species. Permitting and mitigation is not feasible or attracts prohibitive programme risk or costs. Mitigation may include avoidance of works in sensitive areas, design measures, or management practices to minimise risk of damage to sensitive receptors (e.g. through the implementation of a CEMP). Ecological Assessment still to be carried out.	C	Desk top study information indicating protected area
Cultural Heritage and Archaeology	Protected areas/features	Orange	Orange	Green	Orange	Orange	Orange	Green	Green: Site is not in or likely to affect a designated site, area or feature. Orange: Site intersects or is likely to affect a designated site, area or feature. Permitting and mitigation is feasible and low cost. Red: Site intersects or is likely to affect a designated site, area or feature. Permitting and mitigation is feasible and high cost. Black: Site intersects or is likely to affect a designated site, area or feature. Permitting and mitigation is not feasible or attracts prohibitive costs. Mitigation may include avoidance of works in sensitive areas, site management practices to minimise risk of damage to sensitive receptors (e.g. through the implementation of a CEMP).	C	Desk top study information indicating protected area
	Archaeology - known/unknown potential	Orange	Orange	Orange	Red	Orange	Orange	Orange	Green: Site is not in or likely to affect any archaeological resource. Orange: Site is likely to affect one or more archaeological resources. Permitting and mitigation is feasible and of low programme risk and low cost. Red: Site is likely to affect one or more archaeological resources. Permitting and mitigation is feasible but presents significant programme risk and is higher cost. Black: Site is likely to affect one or more archaeological resources. Permitting and mitigation is not feasible or attracts prohibitive programme risk or costs. Eastney is within 100m of a scheduled monument (Fort Cumberland / World War II anti tank blocks). Cost Implication and optioneering refinement TBA following further desk based investigations for site options. Mitigation may include avoidance of works in sensitive areas, design	C	Desk top study information indicating protected area

									measures, or management practices to minimise risk of damage to sensitive receptors (e.g. through the implementation of a CEMP). Construction based mitigation may include an archaeological watching brief with associated recording/museum submissions if artefacts are found of sufficient importance.		
Landscape and Visual	Protected landscapes/landscape features								Green: Site is not in or likely to affect a designated site, area or feature. Orange: Site intersects or is likely to affect a designated site, area or feature. Permitting and mitigation is feasible and low cost. Red: Site intersects or is likely to affect a designated site, area or feature. Permitting and mitigation is feasible and high cost. Black: Site intersects or is likely to affect a designated site, area or feature. Permitting and mitigation is not feasible or attracts prohibitive costs. All areas are situated outside AONB.	C	Desk top study information indicating protected area
	Visual effect and Zone of Visual Influence (ZVI)								Green: Site is not likely to affect sensitive residential or transient receptors. Orange: Site is likely to affect sensitive residential or transient receptors. Permitting and mitigation is feasible and low cost. Red: Site s likely to affect sensitive residential or transient receptors. Permitting and mitigation is feasible and high cost. Black: Site is likely to affect sensitive residential or transient receptors. Permitting and mitigation is not feasible or attracts prohibitive costs. Mitigation may be to minimise joint pit left and by re-instatement	C	OS map and limited long term features
	Setting effect								All areas are situated outside AONB. Historical setting at Eastney may be a consideration TBA following consultation with relevant authority.	O	Desk top study information indicating protected area
Traffic and Transport	Disruption arising from construction phase								Green: No traffic management will be required; Orange: Low level traffic control will be required for a short period of time; Red: A full traffic management control will be required for a long period of time; Black: Traffic control is not practical; Mitigation may include a Traffic Management Plan and provisions in the CEMP to minimise the adverse effects of construction traffic.	C	Landfall visit
Socio-Economic	Disruption to businesses, services, transport, infrastructure, primary care								Green: No disruption; Orange: Construction will affect some local businesses; Red: Construction will affect important infrastructures and public services; Black: Construction will severely affect most of the local facilities and infrastructure; Mitigation may be around minimisation of disruption to business through CEMP or Traffic Management Plan provisions, compensation to businesses or scheduling of works to minimise adverse effects from construction.	C	Landfall visit

Noise and Vibration	Human receptors	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Green: Minimal or nil mitigation likely to be required to meet noise and vibration criteria at sensitive receptor locations. Orange: Mitigation likely to be required to meet noise and vibration criteria at sensitive receptor locations. Red: Significant mitigation required to meet noise and vibration criteria at sensitive receptor locations. Black: Mitigation required to meet noise and vibration criteria at sensitive receptor locations is not feasible. Mitigation may be around minimisation of construction impacts through the implementation of a CEMP, establishment of noise barriers or offsite mitigation at receptor locations.	C	Landfall visit	
	Animal receptors	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Green	Green: Minimal or nil mitigation likely to be required to meet noise and vibration criteria at sensitive receptor locations. Orange: Mitigation likely to be required to meet noise and vibration criteria at sensitive receptor locations. Red: Significant mitigation required to meet noise and vibration criteria at sensitive receptor locations. Black: Mitigation required to meet noise and vibration criteria at sensitive receptor locations is not feasible. Mitigation may be around minimisation of construction impacts through the implementation of a CEMP, establishment of noise barriers or offsite mitigation at receptor locations.	C	Desk top study information indicating protected area	
	Cumulative Effects	Interactions with other committed developments	Green	Green	Green	Green	Green	Green	Green	Green	Cumulative effects are generally low risk in terms of mitigation requirements. TBA following consultation with the relevant authority.	O	Desk top study information.
Environment Offshore	Geology	Changes to geological interest features	Green	Green	Green	Green	Green	Green	Green	Green: Site is not in or likely to affect a designated site or feature. Orange: Site intersects or is likely to affect a designated site or feature. Permitting and mitigation is feasible and low cost. Red: Site intersects or is likely to affect a designated site or feature. Permitting and mitigation is feasible and high cost. Black: Site intersects or is likely to affect a designated site or feature. Permitting and mitigation is not feasible or attracts prohibitive costs. Mitigation may include avoidance of works in sensitive areas, site management practices to minimise risk of damage to sensitive designated site or feature (e.g. through the implementation of a CEMP).	C	BGS maps	
	Bathymetry and Seabed Processes	Cable exposure									Included within Engineering		
		Dredging or burying requirement									Included within Engineering		
		Disturbance to the seabed	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green: No disturbance Orange: Short term disturbance (months) Red: Long term (years) Black: Permanent disturbance Mitigation may be around cable route and site selection, installation design and methodology, (e.g. avoidance of seasonal constraints associated with ecology).	O	BGS maps	

Water Quality	Sediment/beach erosion								Included within Engineering		
	Unexploded ordnance								Included within Engineering		
	Sediment suspension								<p>Green: No Suspension</p> <p>Orange: Some short term suspension from burial, minimal effect on sensitive habitats species, or other receptors (e.g. fisheries). Feasible low cost mitigation.</p> <p>Red: Long term or frequent suspension. Significant effect on sensitive habitats species, or other receptors (e.g. fisheries). Feasible mitigation at high cost.</p> <p>Black: Permanent suspension. Significant effect on sensitive habitats species, or other receptors (e.g. fisheries). Feasible mitigation not possible.</p> <p>Mitigation may be around cable route and site selection, installation design and methodology, (e.g. avoidance of seasonal constraints associated with ecology).</p>	C	UKHO
	Plume dispersion								<p>Green: No plume.</p> <p>Orange: Some short term plume from burial, minimal effect on sensitive habitats species, or other receptors (e.g. fisheries). Feasible low cost mitigation.</p> <p>Red: Long term or frequent plume Significant effect on sensitive habitats species, or other receptors (e.g. fisheries). Feasible mitigation at high cost.</p> <p>Black: Permanent plume Significant effect on sensitive habitats species, or other receptors (e.g. fisheries). Feasible mitigation not possible.</p> <p>Mitigation may be around cable route and site selection, installation design and methodology, (e.g. avoidance of seasonal constraints associated with ecology).</p>	C	UKHO
	Contamination								<p>Green: No likely contamination.</p> <p>Orange: Some contamination possible, minimal effect on sensitive habitats species, or other receptors (e.g. fisheries). Feasible low cost mitigation.</p> <p>Red: Significant contamination possible. Significant effect on sensitive habitats species, or other receptors (e.g. fisheries). Feasible mitigation at high cost.</p> <p>Black: Significant contamination possible. Significant effect on sensitive habitats species, or other receptors (e.g. fisheries). Feasible mitigation not possible.</p> <p>Mitigation may be around cable route and site selection, installation design and methodology, (e.g. avoidance of seasonal constraints associated with ecology).</p>	C	
	Heat emissions								<p>Green: No heat emissions</p> <p>Orange: Minor heat emissions from cable. Minimal effect on sensitive habitats species, or other receptors (e.g. fisheries). Feasible low cost mitigation (e.g. controlled by design)</p> <p>Red: Major heat emissions from cable. Significant effect on sensitive habitats species, or other receptors (e.g. fisheries). Feasible mitigation at higher cost.</p> <p>Black: Major heat emissions from cable. Significant effect on sensitive</p>	O	

									habitats species, or other receptors (e.g. fisheries). Feasible mitigation not possible.. Mitigation may be around cable route and site selection, installation design.		
Ecology	Designated sites								Green: Site is not in or likely to affect a designated site. Orange: Site intersects or is likely to affect a designated site. Permitting and mitigation is feasible and low cost. Red: Site intersects or is likely to affect a designated site. Permitting and mitigation is feasible and high cost. Black: Site intersects or is likely to affect a designated site. Permitting and mitigation is not feasible or attracts prohibitive costs. Lee on Solent 2 and Browndown least constrained by SAC SPA (and Reefs). Mitigation may include avoidance of works in sensitive areas, design measures, or management practices to minimise risk of damage to sensitive receptors (e.g. through the implementation of a CEMP), or off-site mitigations.	C	Desk top study information indicating protected area
	Protected species								Green: Site is not in or likely to significantly affect any protected species. Orange: Site is likely to affect one or more protected species. Permitting and mitigation is feasible and of low programme risk and is low cost. Red: Site is likely to affect one or more protected species. Permitting and mitigation is feasible but presents significant programme risk and is higher cost. Black: Site is likely to affect one or more protected species. Permitting and mitigation is not feasible or attracts prohibitive programme risk or costs. Lee on Solent 2 and Browndown least constrained by SAC SPA (and Reefs). Mitigation may include avoidance of works in sensitive areas, design measures, or management practices to minimise risk of damage to sensitive receptors (e.g. through the implementation of a CEMP).	C	Desk top study information indicating protected area
Socio Economic	Commercial Fisheries								Green: No disruption to the commercial fishery is expected; Orange: Some limitations to the commercial fishery will likely be present; Red: The area will likely be closed for fishery activities for duration of the construction; Black: Fishery will likely be permanently damaged by the construction or operations; Mitigation may be around minimisation of disruption to businesses through CEMP, compensation to businesses or scheduling of works to minimise adverse effects from construction or operations.	C	Desk top study information.
	Tourism, Recreation, Amenity								Green: No disruption to the tourism and recreation is expected; Orange: Some limitations to the tourism and recreation will likely be present; Red: The area will likely be closed for the tourism and recreation for duration of the construction; Black: Tourism and recreation will likely be permanently damaged by the construction; Mitigation may be around minimisation of disruption to businesses through	C	Landfall visit. Desk top study information.

Cultural Heritage	Third Party	Red	Red	Red	Red	Red	Red	Red
	Protected areas	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow
	Marine archaeology	Red	Red	Red	Yellow	Yellow	Red	Yellow
	Cumulative Effects	Green	Green	Green	Green	Green	Green	Green

CEMP, compensation to amenity and businesses or scheduling of works to minimise adverse effects from construction.		
Impact to third parties TBA. In absence of information relatively high risk. Mitigation may be around route selection or compensation agreements.	O	
Green: Site is not in or likely to affect a designated site, area or feature. Orange: Site intersects or is likely to affect a designated site, area or feature. Permitting and mitigation is feasible and low cost. Red: Site intersects or is likely to affect a designated site, area or feature. Permitting and mitigation is feasible and high cost. Black: Site intersects or is likely to affect a designated site, area or feature. Permitting and mitigation is not feasible or attracts prohibitive costs. Protected Wreck close to East Wittering. Mitigation may be around route selection and installation design, or management practices to minimise risk of damage to sensitive receptors (e.g. through the implementation of a CEMP).	C	Desk top study information indicating protected area on approach to landfall
Green: Site is not in or likely to affect any archaeological resource. Orange: Site is likely to affect one or more archaeological resources. Permitting and mitigation is feasible and of low programme risk and low cost. Red: Site is likely to affect one or more archaeological resources. Permitting and mitigation is feasible but presents significant programme risk and is higher cost. Black: Site is likely to affect one or more archaeological resources. Permitting and mitigation is not feasible or attracts prohibitive programme risk or costs. Mitigation may be around route selection and installation design, as well as preconstruction surveys with associated recording/museum submissions if artefacts are found of sufficient importance.	C	Seazone data indicating wreck locations
Cumulative effects are generally low risk in terms of mitigation requirements. TBA following consultation with the relevant authority.	O	

x 1 (Low)	11	13	16	11	13	17	15
x 2 (Moderate)	28	28	24	32	31	25	20
x 3 (High)	7	5	6	3	2	4	9
x 100 (Showstopper)	0	0	0	0	0	0	2
Total Points (Lower the points the better the Option)	88	84	82	84	81	79	282
Site Ranking	6	4	3	4	2	1	7

