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Making Sense of the Marine Environment ™

Morgan and Mona 2022 Offshore Surveys Water Framework Directive Compliance Assessment

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Prepared by:

MarineSpace Ltd

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MarineSpace Ltd
Marine Energy Hub, Second Floor, Pier House, Pier Road, Pembroke Dock, Pembrokeshire, SA72 6TR

Prepared for:

EnBW | bp
Partners in UK offshore wind

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1. Introduction

bp and EnBW (Energie Baden-Württemberg) are seeking marine licences to carry out an environmental, geotechnical and geophysical survey along the potential offshore export cable corridors and offshore wind farm arrays of the Morgan and Mona offshore wind farm sites located in the Irish Sea. As part of the marine licence application for Natural Resources Wales (NRW), NRW require a Water Framework Directive (WFD) compliance assessment to be completed for the proposed works.

Under the WFD, all proposed schemes with the potential to impact upon WFD-designated water bodies must be assessed to ensure:

- No deterioration of the current status or potential of any WFD quality elements; and
- Future attainment of 'good' status or other objectives of any WFD quality elements is not prevented.

This report follows guidance provided in NRW Operational Guidance Note (OGN) 072 (NRW, 2018) for the production of a WFD compliance assessment report.

2. Method Statement

The works proposed involve an environmental, geotechnical and geophysical survey along the potential cable corridors and offshore wind farm arrays of the Morgan and Mona offshore wind farm sites. This WFD assessment considers the works to be undertaken in Welsh waters only, to accompany the marine licence application submitted to NRW Marine Licensing Team. This area includes the Mona offshore wind farm bidding area and potential export cable corridors from the offshore site to the coast of North Wales.

Currently there are six options for the potential export cable corridor, within both English and Welsh waters from the Morgan and Mona sites. This results in a large study area for the surveys. It is expected that only two of these routes will be surveyed, one in English and one in Welsh waters. However, this will not be known in advance of applying for consents. Therefore, all six have been included to ensure consents are in place to allow for any of the options to be investigated when the decision has been made. The maximum number of samples included in this marine licence application allows contingency should surveys be required along two export cable corridors in Welsh waters.

Environmental and Geotechnical surveys

These will include:

- Drop down video/ camera surveys;
- Grab samples;
- Cone penetration tests (CPTs); and
- Vibrocores.

Table 2.1: Estimate of volume of environmental and geotechnical sediment samples

Sample type	Area	Max. no. of samples (m^3)	Approx. volume per sample (m^3)	Approx. total volume of samples (m^3)
Grab samples	Zone of influence around Mona Offshore Bidding Area	20	0.015	0.3
Grab samples	Within Mona Bidding Area	15	0.015	0.225
Grab samples	Along potential export cable corridors	60	0.015	0.9
Grab samples	Along potential export cable corridors – contingency route	60	0.015	0.9
Vibrocores	Within Mona Bidding Area	10	0.06	0.6
Vibrocores	Along potential export cable corridors – contingency route	50	0.06	3.0
Vibrocores	Along potential export cable corridors	50	0.06	3.0
Maximum Total volume of all samples				**8.925**
Most Likely Scenario Total volume of sample (one export cable corridor only)				**5.025**

Deep geotechnical boreholes will also be drilled in 2022 (this survey forms part of a separate marine licence application to be submitted) within the Morgan and Mona offshore array areas; however, these will be located beyond the 12 nautical mile (nm) territorial limit and are not considered within this WFD assessment.

Geophysical surveys

These will include acquisition of multibeam echosounder, side scan sonar, sub bottom profiler and magnetometer data within the offshore bidding areas, the zone of influence around the offshore bidding areas and along the potential export cable corridors. The geophysical survey does not require a marine licence and is not considered further within this WFD assessment.

Timings and Sequence of Works

The surveys are planned in three stages as outlined in Table 2.2 below:

Table 2.2: Indicative survey programme

Anticipated date	Activity
April 2022	**Stage 1:** Geophysical survey data acquisition within Mona and Morgan offshore bidding areas.
April – September 2022	**Stage 2:** Geophysical survey data acquisition along potential export cable corridors. Environmental survey data collection within the bidding areas and zone of influence of the bidding areas.
May- October 2022	**Stage 3:** Environmental and geotechnical survey data acquisition along potential export cable corridors. Deep geotechnical survey, including deep CPTs and boreholes (separate marine licence application to be submitted to NRW for this survey).

Although it is anticipated that the survey works will be completed within four months, a marine licence is being sought for a 12 month period, 1st April 2022 to 31st March 2023, to allow for sufficient contingency and to reduce the likelihood of needing subsequent licence variations, should works be delayed.

3. Screening and Scoping

NRW OGN 072 provides details of certain activities that are not considered to present a risk of deterioration of water body status or preventing a water body from achieving its objective (NRW, 2018). The guidance states that "*sediment (grab) samples where the total sample volume across all samples in the total application is no more than 4 cubic metres … the density of grab samples should not exceed 50 samples within any one hectare*" can be screened out of requiring a WFD assessment. However, the sediment samples proposed for the present application (CPT, boreholes and vibrocore samples) are not considered to qualify as "*sediment (grab) samples*". In accordance, the proposed activities are screened in and require a WFD Assessment and taken forward to the Scoping stage.

The scoping assessment is completed using the scoping template provided by UK Government (UK Gov, 2017), in conjunction with NRW guidance (NRW, 2018). A completed assessment can be found overleaf. This determines that an impact assessment of the works is required in relation to water quality and WFD protected areas.

Water Framework Directive assessment: scoping template for activities in estuarine and coastal waters

Use this template to record the findings of the scoping stage of your Water Framework Directive (WFD) assessment for an activity in an estuary or coastal water.

If your activity will:

- take place in or affect more than one water body, complete a template for each water body
- include several different activities or stages as part of a larger project, complete a template for each activity as part of your overall WFD assessment

The WFD assessment guidance for estuarine and coastal waters will help you complete the table.

Your activity	**Description, notes or more information**
Applicant name	EnBW and bp
Application reference number (where applicable)	Unknown
Name of activity	Morgan and Mona Offshore Wind Farms: Offshore Surveys 2022
Brief description of activity	**Environmental and geotechnical Survey** - Grab samples up to a maximum of 155 samples each a maximum of 0.1m^3 - Drop down video/ camera - Vibrocores, up to a maximum of 110 samples, to an approximate depth of 6 m and 7.5 cm diameter; and - Cone penetration test (CPT), to an approximate depth of 6 m.

	Within the offshore bidding areas, within the zone of influence of the offshore bidding areas and along the potential export cable corridor routes. **Geophysical Survey** Acquisition of multibeam echosounder, side scan sonar, sub-bottom profiler and magnetometer data. Currently there are six options for the potential export cable corridor, within both English and Welsh waters from the Morgan and Mona sites. This results in a large study area for the surveys. It is expected that only two of these routes will be surveyed, one in English and one in Welsh waters. However, this will not be known in advance of applying for consents. Therefore, all six have been included to ensure consents are in place to allow for any of the options to be investigated when the decision has been made. The maximum number of samples included in this marine licence application allows contingency should surveys be required along two export cable corridors in Welsh waters
Location of activity (central point XY coordinates or national grid reference)	Full coordinates in appendix A – Coordinates Spreadsheet Mona offshore bidding area 53.8134 -3.9081 53.6067 -3.7047 53.6053 -3.7061 53.6018 -3.7094 53.5983 -3.9052 53.8610 -3.9976

Footprint of activity (ha)	Removal of a maximum volume of 9 m^3 of seabed sediment, most likely scenario maximum volume up to 5.5 m^3.
Timings of activity (including start and finish dates)	See Table 2.2 Anticipated timing of activity: - April 2022: Geophysical survey data acquisition within both offshore bidding areas. - April - September 2022: Geophysical survey data acquisition along potential export cable corridors. - April - September 2022: Environmental survey data collection within the bidding areas and zone of influence of the bidding areas. - May - October 2022: Environmental and geotechnical survey data acquisition along potential export cable corridors. - May - October 2022 Deep geotechnical survey, including deep CTPs and boreholes within the Mona offshore wind farm bidding area (separate marine licence application). Although it is anticipated that the survey works will be completed within four months, a marine licence is being sought for a 12 month period, 1st April 2022 to 31st March 2023, to allow for sufficient contingency and to reduce the likelihood of needing subsequent licence variations, should works be delayed.
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	Please see Table 2.1 above.
Use or release of chemicals (state which ones)	No

Water body[1]	Description, notes or more information
WFD water body name	North Wales
Water body ID	GB641011650000
River basin district name	Western Wales
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	146.25
Overall water body status (2015)	Moderate
Ecological status	Ecological
Chemical status	Fail
Target water body status and deadline	Good; 2021
Hydromorphology status of water body	Not assessed
Heavily modified water body and for what use	Yes: "*Wider environment - nature protection and other ecological uses*"
Higher sensitivity habitats present	Saltmarsh; blue mussel beds

Lower sensitivity habitats present	Subtidal geogenic reef; intertidal soft sediments like sand and mud
Phytoplankton status	Moderate
History of harmful algae	Not reported
WFD protected areas within 2km	Liverpool Bay Special Protection Area (SPA); Menai Strait and Conwy Bay Special Area of Conservation (SAC); The Dee Estuary SPA; Dee Estuary SAC. Conwy, Llandudno Shellfish Waters; Dee (west) Shellfish Waters; Rhos-on-Sea Shellfish Water. 1x nitrate vulnerable area (#14)

Water body[1]	**Description, notes or more information**
WFD water body name	Anglesey North
Water body ID	GB641010620000
River basin district name	Western Wales
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	126.03
Overall water body status (2015)	Moderate

Ecological status	Good
Chemical status	Fail
Target water body status and deadline	Good; 2021
Hydromorphology status of water body	Not reported
Heavily modified water body and for what use	No
Higher sensitivity habitats present	Polychaete reef; saltmarsh.
Lower sensitivity habitats present	Subtidal soft sediments like sand and mud; subtidal geogenic reef.
Phytoplankton status	Not reported
History of harmful algae	Not reported
WFD protected areas within 2km	Designated bathing waters: Cemaes; Traeth Lligwy; Benllech; St Davids – Benllech; Llanddona. Red Wharf Bay, Moelfe; North Anglesey Marine SAC; Anglesey Terns SPA; Liverpool Bay SPA; Menai Strait and Conwy Bay SAC.

Water body[1]	Description, notes or more information
WFD water body name	Conwy Bay
Water body ID	GB671010400000
River basin district name	Western Wales
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	49.70
Overall water body status (2015)	Moderate
Ecological status	Moderate
Chemical status	Fail
Target water body status and deadline	Good; 2021
Hydromorphology status of water body	Not reported
Heavily modified water body and for what use	Yes; Wider environment - nature protection and other ecological uses
Higher sensitivity habitats present	N/A
Lower sensitivity habitats present	Subtidal soft sediments like sand and mud; geogenic reef; intertidal soft sediments like sand and mud.

Phytoplankton status	Good
History of harmful algae	Not reported
WFD protected areas within 2km	Designated bathing waters: Llanfairfechan; Penmaenmawr; Llandudno West Shore Menai Strait and Conwy Bay SAC; Liverpool Bay SPA; Lavan Sands, Conwy Bay SPA.

Water body[1]	**Description, notes or more information**
WFD water body name	Menai Strait
Water body ID	GB681010120000
River basin district name	Western Wales
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	72.11
Overall water body status (2015)	Good
Ecological status	Good
Chemical status	Good

Target water body status and deadline	Good; N/A
Hydromorphology status of water body	Not reported
Heavily modified water body and for what use	No
Higher sensitivity habitats present	Seagrass; saltmarsh; blue mussel beds.
Lower sensitivity habitats present	Subtidal soft sediments like sand and mud; geogenic reef; intertidal soft sediments like sand and mud.
Phytoplankton status	High
History of harmful algae	Not reported
WFD protected areas within 2km	Menai Strait and Conwy Bay SAC; Anglesey Coast, Saltmarsh SAC; Lavan Sands, Conwy Bay SPA. Designated bathing waters: Llanfairfechan; Penmaenmawr; Llanddwyn Shellfish Waters: Menai Strait (East); Menai Strait (West).

Water body[1]	Description, notes or more information
WFD water body name	The Skerries
Water body ID	GB611010390000
River basin district name	Western Wales
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	47.25
Overall water body status (2015)	High
Ecological status	High
Chemical status	Good
Target water body status and deadline	High; N/A
Hydromorphology status of water body	High
Heavily modified water body and for what use	No
Higher sensitivity habitats present	Biogenic reef; blue mussel beds; saltmarsh.
Lower sensitivity habitats present	Subtidal soft sediments like sand and mud; geogenic reef; intertidal soft sediments like sand and mud.

Phytoplankton status	Not reported
History of harmful algae	Not reported
WFD protected areas within 2km	North Anglesey Marine SAC; Anglesey Terns SPA. Church Bay Designated Bathing Site.

Water body[1]	**Description, notes or more information**
WFD water body name	Mersey Mouth
Water body ID	GB641211630001
River basin district name	North West
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	42051.56
Overall water body status (2015)	Moderate
Ecological status	Moderate
Chemical status	Fail

Target water body status and deadline	Good; 2027
Hydromorphology status of water body	Not assessed
Heavily modified water body and for what use	Yes; transport; wider environment - nature protection and other ecological uses.
Higher sensitivity habitats present	Polychaete reef; mussel beds; saltmarsh.
Lower sensitivity habitats present	Subtidal soft sediments like sand and mud; geogenic reef; intertidal soft sediments like sand and mud.
Phytoplankton status	Moderate
History of harmful algae	Not reported
WFD protected areas within 2km	Liverpool Bay SPA; Shell Flat and Lune Deep SAC; Dee Estuary SAC; The Dee Estuary SPA; Ribble and Alt Estuaries SPA. Designated Bathing Waters: West Kirby; Meols; Moreton; Wallasey; Formby; Ainsdale; Southport; St Annes; St Annes North; Blackpool South; Blackpool Central; Blackpool North; Bispam; Cleveleys; Fleetwood. Nitrate vulnerable zone x2.

Specific risk information

Consider the potential risks of your activity to each of these receptors: hydromorphology, biology (habitats and fish), water quality and protected areas. Also consider invasive non-native species (INNS).

Section 1: Hydromorphology

Consider if hydromorphology is at risk from your activity.

Use the water body summary table to find out the hydromorphology status of the water body, if it is classed as heavily modified and for what use.

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status	Requires impact assessment	**Impact assessment not required**	Works expected to be associated with negligible changes in hydrological processes and seabed morphology. As such, there is no risk of changes to hydromorpholgy.
Could significantly impact the hydromorphology of any water body	Requires impact assessment	**Impact assessment not required**	Core collection will result in removal of benthic sediment. However, the overall total volume of sediment will not exceed 9 m^3 across the whole survey area. This is considered insufficient to affect local hydromorphology.
Is in a water body that is heavily modified for the same use as your activity	Requires impact assessment	**Impact assessment not required**	Activities do not take place in a water body that is heavily modified for the same use as the proposed activities.

Section 2: Biology

Habitats

Higher sensitivity habitats [2]	Lower sensitivity habitats [3]
chalk reef	cobbles, gravel and shingle
clam, cockle and oyster beds	intertidal soft sediments like sand and mud
intertidal seagrass	rocky shore
maerl	subtidal boulder fields
mussel beds, including blue and horse mussel	subtidal rocky reef
polychaete reef	subtidal soft sediments like sand and mud
saltmarsh	
subtidal kelp beds	
subtidal seagrass	

[2] *Higher sensitivity habitats have a low resistance to, and recovery rate, from human pressures.*

[3] *Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures.*

Consider if the footprint[4] of your activity is:	Yes	No	Biology habitats risk issue(s)
0.5km^2 or larger			Footprint <0.5 km²
1% or more of the water body's area			Footprint <1% of water body extent

Within 500m of any higher sensitivity habitat	**Yes to one or more – requires impact assessment**	No to all – impact assessment not required	Given the current uncertainty over location, it cannot be ruled out that the activity will take place within 500 m of a higher sensitivity habitat.
1% or more of any lower sensitivity habitat			Footprint <1% of lower sensitivity habitat

[4] *Note that a footprint may also be a temperature or sediment plume. For dredging activity, a footprint is 1.5 times the dredge area.*

Fish

Consider if fish are at risk from your activity, but only if your activity is in an estuary or could affect fish in or entering an estuary.

Consider if your activity:	Yes	No	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Continue with questions	**Go to next section**	Works take place within coastal waters and not within estuarine areas. Given the nature of the proposed works, they are not expected to impact migratory fish physiology/behaviour.
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	Requires impact assessment	Impact assessment not required	n/a
Could cause entrainment or impingement of fish	Requires impact assessment	Impact assessment not required	n/a

Section 3: Water quality

Consider if water quality is at risk from your activity.

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	Requires impact assessment	**Impact assessment not required**	Borehole vibrocore removal will result in highly localised short-term increase in suspended sediment concentration/turbidity. However, this is expected to disperse rapidly.
Is in a water body with a phytoplankton status of moderate, poor or bad	**Requires impact assessment**	Impact assessment not required	The phytoplankton status of North Wales and Mersey Mouth water bodies are moderate.
Is in a water body with a history of harmful algae	Requires impact assessment	**Impact assessment not required**	No

Consider if water quality is at risk from your activity through the use, release or disturbance of chemicals.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment	**Impact assessment not required**	No chemicals will be intentionally released into the marine environment. Bunding, storage facilities and spill kits will be employed to contain and prevent the accidental release of fuel, oils and chemicals associated with the plant, refuelling and construction equipment into the marine environment.

It disturbs sediment with contaminants above Cefas Action Level 1	**Requires impact assessment**	Impact assessment not required	Sediments may be disturbed during core removal. In view of the extensive geographic area in which works are proposed, it cannot be excluded that this will involve disturbance of sediments containing contaminants above Cefas Action Level 1.

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	Yes	No	Water quality risk issue(s)
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment	**Impact assessment not required**	No mixing zone associated with these works.

Section 4: WFD protected areas

Consider if WFD protected areas are at risk from your activity. These include:

- special areas of conservation (SAC)
- special protection areas (SPA)
- shellfish waters
- bathing waters
- nutrient sensitive areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2km of any WFD protected area[6]	**Requires impact assessment**	Impact assessment not required	Aspects of projects within: • Liverpool Bay SPA • The Dee Estuary SPA • Anglesey Tern SPA • Lavan Sands, Conway Bay SPA • Menai Strait and Conwy Bay SAC • Dee Estuary SAC

			• North Anglesey Marine SAC Project direct or indirect effects may also interact with various designated bathing waters or shellfish waters, as identified in screening and scoping tables.

[6] *Note that a regulator can extend the 2km boundary if your activity has an especially high environmental risk.*

Section 5: Invasive non-native species (INNS)

Consider if there is a risk your activity could introduce or spread INNS.

Risks of introducing or spreading INNS include:

- materials or equipment that have come from, had use in or travelled through other water bodies
- activities that help spread existing INNS, either within the immediate water body or other water bodies

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment	**Impact assessment not required**	All equipment, materials, machinery and PPE used will be in a clean condition prior to their arrival on site, and upon removal from site, to minimise risk of introducing non-native species into the marine environment.

Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	
Biology: habitats	Yes	Given the current uncertainty over location, it cannot be ruled out that the activity will take place within 500 m of a higher sensitivity habitat.
Biology: fish	No	
Water quality	**Yes**	Borehole vibrocore removal may disturb benthic sediments. In view of the extensive geographic area in which works are proposed, it cannot be excluded that this will involve disturbance of sediments containing contaminants above Cefas Action Level 1. In addition, the phytoplankton status of North Wales and Mersey Mouth water bodies are moderate, as such the potential effects on phytoplankton will be assessed.
Protected areas	**Yes**	Works take place within 2 km of various UK National Network sites, designated bathing waters and shellfish sites. In addition, the works may directly overlap with the Liverpool Bay and Dee Estuary SPAs and the Menai Strait and Conwy Bay, Dee Estuary, and North Anglesey Marine SACs.
Invasive non-native species	No	It is determined that the proposed works present negligible risk of spread of instruction of INNS.

4. Compliance Assessment

This section considers the potential impacts from the proposed activities and determines the risk that these activities may prevent any WFD quality element within any water body achieving good status or may cause deterioration.

The following receptors or features identified as part of the scoping stage have been brought through for detailed assessment:

- Biology: habitats;
- Water Quality; and
- Protected areas.

4.1. Biology: Habitats

The potential for adverse effects on biological habitat WFD quality elements was identified as the surveys may take place within the vicinity of higher sensitivity habitats. Sample locations will be planned and a drop down video/ camera will be utilised before the grab sample as well as analysis of the 2021 geophysical survey data to help identify and avoid sensitive habitats.

These habitats include saltmarsh, blue mussel beds, polychaete reef and seagrass. It is not expected there will be any direct spatial overlap between the proposed works and these habitats and, as such, effects are only possible through secondary effects pathways. This may occur through increased sedimentation that results from elevated suspended sediment concentrations (SSCs) following sediment disturbance. Although the MarLIN habitat sensitivity index (MarLIN, 2021) notes that saltmarsh and polychaete reef habitats have low sensitivity and no sensitivity respectively, mussel beds are classed as medium sensitivity, and seagrass as very high sensitivity. However, these habitats are located in coastal locations where high energy wave action will be expected to disperse temporary elevations in SSC. The proposed survey activities are expected to disturb very small volumes of sediment, and any elevation in SSC will be of negligible magnitude. As such, these changes are not expected to be measurable against background variation in turbidity levels and are not expected to impact even highly sensitive receptors. Any seabed disturbance caused by the proposed works will be short term and therefore associated plumes will be transient. It is therefore concluded that there is no risk of adverse effects on these habitats.

4.2. Water Quality

The proposed survey involve removal of sediment samples through the use of vibrocore and grab sampling techniques. This may result in the mobilisation of a limited amount of benthic sediment. There is potential for contaminants within this mobilised sediment to be transferred into the water column.

In view of the extensive geographic range within which survey operations will take place, it is considered that the potential for seabed sediment to contain chemical contaminants will be highly variable. Cefas completed a review of the contaminant status of the Irish Sea in 2005 (Cefas, 2005). Although there are eight offshore hydrocarbon extraction installations in the north Irish Sea

(EMODnet, 2021) the report notes that inputs of natural and anthropogenic contaminants in this area predominantly come from riverine discharges. Levels of mercury and zinc were shown to exceed environmental quality standards around the Mersey and Ribble estuaries, suggesting that contaminants originated in input from these rivers, such as wastewater, rather than offshore industrial discharges. Similarly, concentrations of PAHs were significantly higher in inshore areas where there was either riverine input and/or industry. In agreement with this, metal concentrations were shown to generally fall with increasing distance from shore.

It is considered unlikely that the proposed scheme will result in a deterioration in the status of any WFD water body due to the small volumes of sediments expected to be mobilised. In the eventuality that these sediments do contain contaminants, the high potential for dilution mitigates the risk of environmental effects. In addition, the volume of sediment disturbed must be contextualised against the background level of sediment disturbance that would occur due to natural events such as storms. It is expected that any sediment that is disturbed will be rapidly diluted; the proposed works are planned for offshore and open coastal waters, and therefore it is likely that any mobilised contaminants will be transported away and diluted to background levels within one tidal cycle. As such, any increases in contaminants will be temporary and no deterioration in the current status of this waterbody as a result of the survey activities is predicted.

4.3. Protected Areas

Aspects of the proposed works may take place within the following Natura 2000 nature conservation sites:

- Liverpool Bay SPA;
- The Dee Estuary SPA;
- Anglesey Tern SPA;
- Lavan Sands, Conway Bay SPA;
- Menai Strait and Conwy Bay SAC;
- Dee Estuary SAC; and
- North Anglesey Marine SAC.

The Liverpool Bay SPA is designated for non-breeding populations of red-throated diver *Gavia stellata*, little gull *Hydrocoloeus minutus*, and common scoter *Melanitta nigra*, breeding populations of little tern *Sternula albifrons*, and common tern *Sterna hirundo*, and an internationally important waterbird assemblage. The Dee Estuary SPA is classifieded for non-breeding populations of common shelduck *Tadorna tadorna*, Eurasian teal *Anas crecca*, northern pintail *Anas acuta*, Eurasian oystercatcher *Haematopus ostralegus*, grey plover *Pluvialis squatarola*, red knot *Calidris canutus*, dunlin *Calidris alpina alpina*, black-tailed godwit *Limosa limosa islandica* and *Limosa lapponica*, Eurasian curlew *Numenius arquata*, common redshank *Tringa totanus*, and Sandwich tern *Sterna sandvicensis.* The site is also designated to protect classified breeding populations of common tern and little tern, and a waterbird assemblage of international importance.

The Menai Strait SAC contains the following designated annex I habitats: sandbanks which are slightly covered by sea water all the time (H1110), mudflats and sandflats not covered by seawater at low tide (H1140), reefs (H1170), large shallow inlets and bays (H1160), and submerged or partially submerged sea caves (H8330).

The Dee Estuary has been designated as a SAC because it hosts the following designated Annex I habitats mudflats and sandflats not covered by seawater at low tide (H1140); Salicornia and other annuals colonizing mud and sand (H1310); Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (H1330); estuaries (H1130); annual vegetation of drift lines (H1210); vegetated sea cliffs of the Atlantic and Baltic coasts (H1230); embryonic shifting dunes (H2110); shifting dunes along the shoreline (H2110); fixed dunes with herbaceous vegetation and humid dune slacks (H2130). The site also supports sea lampreys *Petromyzon marinus*, river lampreys *Lampetra fluviatilis* and petalwort *Petalophyllum ralfsii*. The North Anglesey Marine SAC is designated to protect harbour porpoise *Phocoena phocoena*.

In addition, works may also take place within 500 m of various designated shellfish waters or bathing waters.

The proposed works may pose a risk to these protected areas through increases in turbidity or contaminant concentrations following disturbance of benthic sediments. However, the volume of sediment disturbed is expected to be small and will therefore rapidly be diluted to background levels. Any changes will be highly localised in terms of spatial extent and limited in duration to within a single tidal cycle. Any changes can therefore be classed as temporary and will not pose a threat of adverse impacts upon any of the protected areas identified.

5. Conclusion

This assessment has considered the potential risks to WFD receptors from the proposed environmental, geotechnical and geophysical survey works. All receptors were scoped out of assessment other than Biology (Habitats), Water Quality, and Protected Areas.

Pathways to potential impacts were limited to sediment mobilisation from core removal, and associated changes in turbidity and/or contaminant levels. However, given the temporary and small magnitude of predicted changes the proposed survey activities are not expected to pose any risk of deterioration in water body status or cause adverse effects on WFD protected areas.

It is concluded that the proposed works do not pose any risks to the status or objectives of local WFD water bodies. The impacts assessed have all been determined to have a negligible impact at the scale of the overall water body and as such the proposed activities are considered to be compliant with the WFD.

6. References

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