

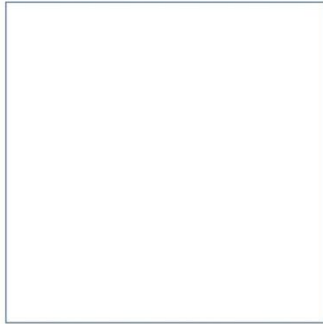
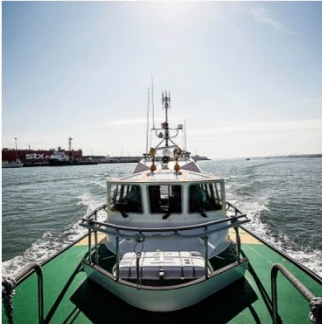
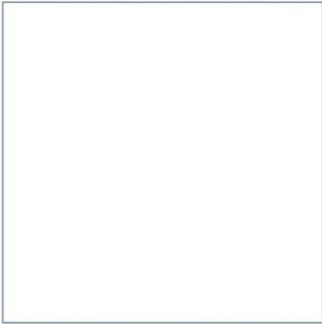
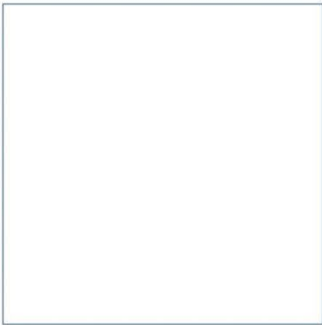
Port of Mostyn

Mostyn Energy Park Extension

Environmental Statement

Chapter 11: Flood Risk and Drainage

December 2022



Innovative Thinking - Sustainable Solutions

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Mostyn Energy Park Extension

Environmental Statement




Chapter 11: Flood Risk and Drainage

December 2022



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11 Flood Risk and Drainage

11.1 Introduction

This chapter provides an assessment of the potential significant effects of the MEPE Project on flood risk and drainage on and off the site. It also presents the results of the Flood Consequence Assessment (FCA) required in support of the marine licence application for this development. This chapter has been prepared by Wardell Armstrong LLP.

The following receptors have been considered as part of the assessment:

- Port of Mostyn, including the existing MEP;
- Construction site; and
- Dee Estuary.

Section 11.2 provides a definition of the study area for this topic, Section 11.3 presents the impact assessment approach that has been followed and Section 11.4 details the consultation which has taken place. Section 11.5 describes the legislation, policy and guidance position in respect of this topic and Section 11.6 describes the baseline conditions of the study area. An impact assessment describing changes to the baseline environment is then presented in Section 11.7, mitigation measures and residual effects are reviewed in Section 11.8. Section 11.9 provides an overall final summary of the topic assessment.

The assessment has been carried out in accordance with the guidance set out in Technical Advice Note 15: Development and Flood Risk (TAN15). It is structured to follow the general principles of the technical requirements for assessing flood consequences given in TAN15 and meets the requirements set out by the National Planning Policy Statement for Ports (NPSfP). The assessment is also informed by a FCA which is included in Appendix 11.1.

11.2 Definition of study area

The study area for this assessment is the area over which potential direct and indirect effects of the MEPE Project are predicted to occur during the construction and operational periods.

Direct effects on flood risk are those that may arise due to increases in the rate and volume of surface water runoff, a loss of floodplain storage or the diversion of existing fluvial and surface water flood flow routes. The proposed development may also affect water quality as a result of increased concentrations of suspended solids and pollutants within flows discharging from the site.

The study area for this chapter is the area of coastline covered by Dee Estuary Cell 11a 5 of Great Orme's Head to Solway Firth SMP22 and the section of the River Dee covered by the Dee River Basin District Flood Management Plan.

11.3 Impact assessment methodology

11.3.1 Data and information sources

Current baseline conditions have been determined through a desk-based review of available information. The main sources of information that have been reviewed to inform the current baseline description within the vicinity of the proposed development include:

- Ordnance Survey mapping;
- NRW Flood Risk Assessment Wales Mapping:
 - Flood Risk from Rivers
 - Flood Risk from the Sea
 - Flood Risk from Surface Water and Small Watercourses
 - Recorded Flood Extents
- NRW Extreme Sea Level Information;
- British Geological Survey mapping; and
- North West England and North Wales Shoreline Management Plan 2 (SMP2).

11.3.2 Determining significance of effects

To facilitate the impact assessment process and ensure consistency in the terminology of significance, a standard staged assessment methodology has been applied. The effect of the proposed development will be determined by describing the baseline environmental conditions; the 'impact pathway' by which a receptor could be affected; the significance of the impact; and the mitigation measures for significant adverse impacts. This will follow the methodology presented in the Impact Assessment Approach (Chapter 5).

11.4 Consultation

Consultation with regard to the outcomes of the formal scoping process and whether there are any likely effects of the MEPE Project on flood risk and drainage receptors has been undertaken as appropriate with NRW.

The consultation, along with the outcome of such consultation and how it has influenced the assessment is provided in Table 11.1.

Table 11.1. Summary of consultation to date

Consultee	Reference, Date	Summary of Response	How Comments have Been Addressed in this Chapter
NRW	Scoping Opinion, 06 January 2022	The FCA will need to be prepared in accordance with TAN15: Development, flooding and coastal erosion, December 2021.	The FCA is included in Appendix 11.1 and has been prepared in accordance with TAN15.
NRW	Scoping Opinion, 06 January 2022	The FCA will need to assess the flood risk posed to the site and also consider the impact of the proposals on flood risk elsewhere.	The FCA has assessed the flood risk posed to the site and surroundings (Appendix 11.1).
NRW	Scoping Opinion, 06 January 2022	The FCA would also need to demonstrate that the reclaimed area of land which is to be used for storage, workshop or office space is raised above expected flood levels for the 0.5% Annual Exceedance Probability (AEP) event with a 75 year allowance for climate change, in accordance with the requirements of Section 11.6 of TAN15.	The FCA has taken this consideration into account (see Appendix 11.1).
NRW	Scoping Opinion, 06 January 2022	Consideration will also need to be given to the flood risk posed to the site in the 0.1% AEP event with an allowance for climate change, (as outlined in Sections 11.10 and Figure 9 of TAN15 2021).	This has been taken into account in the FCA (Appendix 11.1).
NRW	06 June 2022	Receipt via email of modelled tidal flood levels, historical flood outlines and general comments on scope of works.	Data and feedback has been used to inform the FCA (Appendix 11.1).
NRW	26 October 2022	Formal Pre-Application Advice received via email confirming need for an FCA and the requirements for this, including: <ul style="list-style-type: none"> ▪ The development is flood free in the 0.5% AEP event; ▪ Assessment of flood risk to off-site areas; and ▪ Consideration for Site of Special Scientific Interest (SSSI) and protected sites. 	Advice has been used to inform the FCA (Appendix 11.1).

11.5 Implications of legislation, policy and guidance

This section of the chapter sets out key aspects and implications of policy and guidance that are relevant to the assessment of likely impacts on flood risk and drainage. It builds upon the overarching chapter covering Legislation, Policy and Guidance (Chapter 4).

11.5.1 Legislation

The Water Framework Regulations

Directive 2000/60/EC of the European Parliament and Council (the Water Framework Directive ('WFD')) came into force on 22 December 2000 and established a framework for community action in the field of water policy.

This EU directive was transposed into English and Welsh law by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The WFD is designed to enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands, to promote sustainable water use, to reduce pollution of water and to ensure a progressive reduction in groundwater pollution. The WFD established a strategic framework for managing the water environment and requires a management plan for each river basin to be developed every six years. The competent authority (in Wales) for delivering the WFD is NRW.

European Directive: The Priority Substances Directive (2008/105/EC)

Directive 2008/105/EC of the European Parliament and Council (the Priority Substances Directive) came into force on 16 December 2008 and sets environmental quality standards in the field of water policy. The Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations 2015 transposes The Priority Substances Directive (2008/105/EC).

The Priority Substances Directive was developed in response to the requirements of Article 16 of the WFD and requires the identification of priority substances to set Environmental Quality Standards ('EQSs') for the concentrations of the priority substances in surface waterbodies and to review periodically the list of priority substances.

11.5.2 National policy

National Policy Statement for Ports (NPSfP)

The NPSfP is part of the planning system established under the 2008 Act to deal with significant infrastructure proposals and provides the framework for decisions on proposals for new port development. The NPSfP explains the approach that should be taken for new proposals and the main issues which need to be addressed to ensure the development is fully sustainable and to the positive and negative impacts it may bring.

Section 5.2 in the NPSfP outlines the approach for flood risk. The aims of the planning policy on development and flood risk are to ensure that flood risk from all sources of flooding is taken into account at all stages in the planning process, to avoid inappropriate developing in areas at risk of flooding and to direct development away from areas at highest risk. Where new development is, exceptionally, necessary in such areas, including 'water compatible' development, the policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall. Port development, such as the MEPE Project, is water compatible development and, therefore, acceptable in high flood risk areas.

The National Strategy for Flood and Coastal Erosion Risk Management in Wales 2010

This UK National Strategy for flood and coastal erosion risk management was adopted in Wales in 2010. This strategic document sets national policies on flood and coastal erosion risk management in Wales in order to reduce the consequences from flooding and coastal erosion, to raise awareness on flood and coastal erosion risk, and to provide an effective response system to flood and coastal erosion events.

Welsh National Marine Plan (WNMP)

The WNMP was published in November 2019 by the Welsh Government. The plan proposes a series of objectives to contribute to the sustainable development within the Welsh marine regions. The plan includes a sector policy for Ports and Shipping which covers the construction, operation and maintenance of ports and harbours.

There are two policies in the WNMP that specifically relates to flood risk:

- **SOC_08 Resilience to coastal change and flooding** - Proposals should demonstrate how they are resilient to coastal change and flooding over their lifetime.
- **SOC_09 Effects on coastal change and flooding** - Proposals should demonstrate how they: avoid significant adverse impacts upon coastal processes; and minimise the risk of coastal change and flooding; Proposals that align with the relevant Shoreline Management Plan(s) and its policies are encouraged.

11.5.3 Local policy

Dee River Basin Management Plan 2021 – 2027 Summary (2022)

River Basin Management Plans (RBMPs) are required for each River Basin District under the WFD regulations. The Dee RBMP was undertaken jointly by NRW and the Environment Agency and the 2022 report is the second of three planning cycles. The RBMP outlines the current condition of the River Basin District plus the Programme of Measures for improving the water environment by 2027.

Dee River Basin District Flood Risk Management Plan (2016)

Flood Risk Management Plans (FRMPs) are produced every six years and identify the risk of flooding from rivers, the sea, surface water, groundwater and reservoirs within a river basin, and confirm how flood and coastal risk will be managed, setting measures for the next six years. The River Dee extends from Snowdonia to the Dee Estuary, with the site of the proposed development situated at the outer extent of the River Basin District.

River Dee Catchment Flood Management Plan (2010)

The River Dee Catchment Flood Management Plan (CFMP) was produced in January 2010 by the Environment Agency Wales. The plan sets new policies to manage existing and future flood risk within catchments. The Port of Mostyn is located within Sub-area 6 'Deeside, Wirral and North Flintshire'. As stated in the CFMP, the area has a dependence on flood defences to reduce the likelihood of flooding and whilst sea defences will be maintained, these may not have their height increased in the future.

Flintshire County Council Preliminary Flood Risk Assessment (2011)

The Flintshire County Council Preliminary Flood Risk Assessment (PFRA) was produced in 2011 by Flintshire County Council to provide a high level summary of past and future flood risk from a range of sources, and to identify areas of significant flood risk ('Flood Risk Areas').

11.5.4 Guidance

Technical Advice Note (TAN) 15

TAN 15 'Development and Flood Risk' was published in July 2004 by Welsh Assembly Government (WAG) and gives guidance to planning authorities in Wales on how to respond on flood risk grounds to development proposals. TAN15 expects planning authorities to apply a risk-based approach to development planning and control through a Sequential Test involving location justification, type of development and flooding consequences.

In October 2017, the Welsh Government published the latest TAN15 Development Advice Maps (DAMs) which show areas potentially at risk from flood events and divides the land area of Wales into flood risk zones.

The DAM shows that the proposed development is located within Zone C1 (areas of the floodplain... 'served by significant infrastructure including flood defences') and Zone C2 (areas of the floodplain 'without significant flood defence infrastructure').

TAN 15 also includes the 'Justification Test' which all proposed developments within Zone C must pass. As the MEPE Project would repurpose existing developed land to provide employment opportunities whilst managing flood risks, it is considered that the Justification Test is passed.

TAN15 was revised in December 2021 and renamed 'Development, Flooding and Coastal Erosion'. The revision will retain the flood zone designations and 'Justification Test' and will come into force fully in June 2023.

Technical Advice Note (TAN) 14

TAN 14 'Coastal Planning' was published in March 1998 by the WAG and gave guidance to planning authorities in Wales on the considerations to be given for proposed developments in coastal zones. This has since been incorporated into the December 2021 update to TAN 15.

11.6 Description of the existing environment

11.6.1 Site description and location

The MEPE site (referred to herein as 'the site') is located on the Welsh side of the Dee Estuary within the Port of Mostyn (the Port), approximately 0.5 km to the north of the village of Mostyn. An approximate National Grid Reference for the centre of the site is SJ 15983 81594 and the nearest postcode is CH8 9HE.

The western area of the site presently comprises a narrow breakwater structure. The section of breakwater within the development is approximately 320 m in length which consists of a raised platform with steep slopes extending down to the water level. The eastern part of the site comprises an area of open water.

The site area is bounded to the south by warehouses and areas of hardstanding within the port estate, including the existing MEP. The site is bounded on all other sides by the sands and open waters of the Dee Estuary.

The existing breakwater does not have any formal drainage infrastructure, however, areas of the wider Port are served by private surface water drainage networks. These discharge to a series of soakaway structures and/or via a single outfall to the Dee Estuary.

The site is located within the outer part of the Dee Estuary. The closest Main Rivers to the site are a network of unnamed channels to the north-west of the village of Ffynnongroyw, approximately 3 km to the north-west of the site. The closest watercourse to the site is an unnamed watercourse (an Ordinary Watercourse), located approximately 730 m to the south-west of the site flowing north-eastwards through Mostyn and passing beneath Coast Road (A548) to discharge to the Dee Estuary. The site is downstream of this watercourse and there is no connectivity between the site and the watercourse.

11.6.2 Existing Flood Risk

The FCA is contained in Appendix 11.1 and assesses the existing baseline risk of flooding to the site from all sources.

The NRW Development Advice Map (DAM) shows that the raised sections of the existing breakwater are classified as Zone B (*'areas known to have flooded in the past evidenced by sedimentary deposits'*). This classification is based on the geology only, and as sedimentary deposits are always likely underly areas of reclaimed coastline, As large portions of the breakwater and adjacent areas of the Port are approximately 12 m above Chart Datum (CD) it is not considered that this translates to an existing risk of flooding.

Lower lying sections of the breakwater and all marine areas are classified as Zone C2 *'Areas of the floodplain without significant flood defence infrastructure'*.

Fluvial Flood Risk

The adjacent sections of the Dee Estuary are tidally-influenced and are not considered to be a source of fluvial flooding. The site is not at risk of flooding from the Main Rivers and Ordinary Watercourses in the vicinity of the site.

Tidal Flooding

NRW flood mapping shows that the raised sections of breakwater are at a very low risk of tidal flooding. Lower-lying sections of the breakwater are at a high risk of flooding, which is assumed to be a result of its situation within an intertidal area where it will be inundated on a daily basis by tidal movements. The adjacent sections of the port estate, including the MEP are also generally at a very low risk of tidal flooding, with only lower-lying jetties at an increased risk.

Modelled extreme sea level data obtained from NRW shows that the raised area of the breakwater is above the extreme sea level for all return periods. Adjacent areas of the existing port estate, including the MEP, are also situated above the extreme sea level for all return periods.

Surface Water Flooding

NRW mapping for the flood risk from surface water runoff and small watercourses shows that the site is at a very low risk of flooding and remote from areas of higher risk within the Port area.

Groundwater Flooding

It is assumed that there is no natural bedrock present within the breakwater, and the risk of flooding from groundwater is discounted.

Sewer Flooding

It is assumed that there is no formal surface water drainage network within the breakwater and the risk of flooding from this source is discounted.

Water Quality

The NRW RBMP for the Dee River Basin District identifies the section of watercourse adjacent to the site as the 'Dee (N. Wales) transitional waterbody'. It is recorded as a heavily modified waterbody (HMWB) due to navigation, ports and harbour use. The current (2018) overall status of the waterbody is 'moderate', with an ecological potential of 'moderate', and a chemical status of 'fail'. The reason for the 'fail' chemical status is based on priority substances trichlorobenzenes, and priority hazardous substances 'polybrominated diphenyl ethers (PBDE)' and 'mercury and its compounds'.

Online Defra 'MAGIC' mapping shows that the site is situated within the Dee Estuary SAC, SPA and Ramsar site. The site is also situated in the vicinity of two WFD 'Lower Sensitivity' habitats: Intertidal Soft Sediment and Subtidal Soft Sediment.

11.6.3 Future baseline

Should the MEPE Project not take place, the existing coastal defence and drainage structures within the port estate would be maintained and hydrodynamic and sedimentary processes will continue to be influenced by natural and human-induced variability, ongoing cyclic patterns and trends (e.g. ongoing maintenance dredging and disposal).

It is anticipated that climate change will result in an increase of intensity and frequency of rainfall. This is likely to raise river levels and increase the likelihood of a river overtopping its banks. An increase in rainfall intensity could also increase the rate and volume of surface water generated during a storm event.

In the absence of the proposed development, it is anticipated that the risk of surface water flooding would increase within the Port area, resulting in more frequent flooding events and larger flooding extents. The rate and volume of surface water runoff discharging to the River Dee would also increase during storm events.

It is also anticipated that that climate change will cause an increase in sea levels and potential changes to storminess/storm surges and wave heights, resulting in an increased risk of tidal flooding to low lying areas.

11.7 Impact assessment

This section identifies the potential likely effects on the Flood Risk and Drainage receptors as a result of the construction and subsequent operation of the MEPE project and has been informed by the findings of the FCA (Appendix 11.1).

The following impact pathways have been assessed:

- **Construction Phase**
 - Increased rate and volume of surface water runoff from increased areas of hardstanding during the ongoing construction works causing surface water flooding within the existing port estate, including the MEP;

- Increased rate and volume of surface water runoff causing flooding within the MEPE construction site;
- Increased rate and volume of surface water runoff increasing the risk of flooding within the Dee Estuary; and
- Pollution incidents during the construction phase, impacting on water quality within the Dee Estuary.
- **Operational Phase**
 - Increased rate and volume of surface water runoff from the increased areas of hardstanding within the completed development, causing flooding within the existing port estate and MEP;
 - Increased rate and volume of surface water runoff increasing the risk of flooding within the Dee Estuary; and
 - Mobilisation of suspended solids and pollutants from the laydown/storage area during the operational phase impacting on the Dee Estuary.

In addition, the potential risks to human health, the potential impacts on climate and the vulnerability of the proposed development to climate change, as well as to risks of major accidents and/or disasters have been considered in the context of the potential likely effects on flood risk and drainage.

Cumulative impacts on flood risk and drainage arising as a result of other coastal and marine developments and activities in the Dee Estuary will be considered as part of the cumulative impacts and in-combination effects assessment, the approach to which is explained further in Chapter 13 of this ES.

11.7.1 Risk of surface water flooding during construction phase

Whilst the reclamation of land will be done from temporary platforms or jack up barges with no risk of surface water or tidal flooding, the final phases of construction will be landside work. During an extreme storm event, surface water flooding could occur within the construction area.

Any flooding would be temporary, would not greatly affect operations and would pose no risk to the safety of operatives.

Using the impact assessment methodology, the anticipated frequency (probability) of such extreme storm events would be low and there would be a negligible magnitude of change, with the port and existing MEP still able to operate. The exposure to change would, therefore, be negligible. The sensitivity of the construction site would be negligible and only a negligible area affected. The vulnerability would, therefore, be none. The importance of the area affected could be considered negligible as construction works may need to be paused while runoff is managed or dispersed, however, there would be minimal impact on what is being constructed. With a vulnerability of none, the significance is assessed as **insignificant**.

11.7.2 Increase in risk of flooding within the Dee Estuary during construction and operational phases

Increased rates and volumes of surface water runoff discharging to a watercourse has the potential to raise river levels and increase the likelihood of a river overtopping its banks. Portions of the surface water runoff presently generated within the Port are discharged to the Dee Estuary. If runoff from the new area of hardstanding was to discharge to the Dee Estuary directly, or via the existing drainage network, flows to the Dee Estuary would be increased. There is no connectivity between the site and any other watercourses, and any increase in flood risk within these catchments is discounted.

As the Dee Estuary is a large, tidal body of water with a large upstream catchment, there would be no discernible change to water levels as a result of the increased runoff from the additional hardstanding.

Following the impact assessment methodology, the probability of an extreme storm event generating large volumes of runoff is considered to be low, with a negligible magnitude of change on a very large watercourse. The exposure to change would, therefore, be negligible.

The sensitivity of the feature to increased inflows is none, and the exposure to change would be low. The vulnerability would, therefore, be none.

The vulnerability of the Dee Estuary to the impact of increased runoff from a relatively small area of hardstanding is none. Whilst the Dee Estuary is a large tidal estuary, with a high importance, given the vulnerability is considered to be none, the significance is assessed as **insignificant**.

11.7.3 Mobilisation of suspended solids and pollutants during construction phase

Pollution incidents during landside construction works, including leakages and spillages of fuels, chemicals and cement based products, along with the mobilisation of sediments, have the potential to impact on the water quality in the Dee estuary if they are able to enter the watercourse. The potential mobilisation of sediment and redistribution of any associated contaminated sediment as part of the dredging and infilling works is considered as part of other assessment chapters within the ES, namely Physical Processes (Chapter 6) and Water and Sediment Quality (Chapter 7).

The RBMP for the Dee River Basin District shows the overall status of the waterbody is 'moderate' with a 'moderate' ecological potential and chemical status 'fail'.

Following the impact assessment methodology, the magnitude of change would be small within a large tidal estuary, with a large upstream catchment river catchment. With standard good working practices in place, as is already the case throughout the rest of the port estate, the probability of an incident would be low and the exposure to change would be negligible.

The sensitivity of the Dee Estuary with a poor chemical status to a small-scale pollution incident would be low and the exposure to change would be low. The vulnerability would, therefore, be none.

Given the vulnerability is considered to be none and the high importance of the feature, the significance is assessed as **insignificant**.

11.7.4 Increase in risk of surface water flooding within the MEP and Port during the operational phase

The proposed land reclamation will produce approximately 4 ha of new ground. Whilst this will generally be semi-permeable ground, there would be an increase in impermeable area within the port estate, including the MEP, when compared to the existing breakwater structure and areas of open water. The rate and volume of surface water runoff generated during storm events may, therefore, increase. If surface water runoff is able to flow freely into the port estate, including the existing MEP, there is a risk that this will cause surface water flooding within low lying areas, which are potentially already at risk from surface water flooding based on NRW mapping.

It is noted, however, that there are large areas of existing hardstanding and roof areas within the port estate and MEP, and the 4 ha of additional impermeable ground would be relatively minimal when compared to the Port of Mostyn as a whole. Furthermore, surface water runoff generated within the

port at present is generally able to infiltrate to ground and large volumes of overland flow do not cross the site during storm events. This would continue during the operational phase.

Any surface water flooding as a result of the proposed development would be temporary with this able to disperse via the existing drainage networks within the Port or by evaporation. Short term flooding may affect operations within the port and existing MEP, for example if standing water prevented storage areas or car parking from being used. It is considered that the additional rate and volume of runoff would not be such that it causes a risk to persons.

Based on impact assessment methodology that is presented in Chapter 5 and has been applied here, the anticipated frequency (probability) of such extreme storm events would be low and there would be a negligible magnitude of change, with the port and existing MEP still able to operate. The exposure to change would, therefore, be negligible. The sensitivity of the Port and existing MEP would be low and there would be a negligible area of the Port exposed to the increase runoff. The vulnerability would, therefore, be none. If only isolated areas of hardstanding were impacted by the additional accumulations of surface water runoff, the importance of the area affected could be considered low. With a vulnerability of none, the significance is assessed as **insignificant**.

11.7.5 Mobilisation of suspended solids and pollutants to Dee Estuary during operational phase

Pollutants and suspended solids could be mobilised during the operational phase within surface water runoff from materials stockpiled within the new laydown area and from the use of plant within the development. These could then discharge to the Dee Estuary.

As stated above, the relevant transitional water body of the Dee River Basin District has a 'moderate' overall status with a 'moderate' ecological potential and a 'fail' chemical status.

Following the impact assessment methodology, the magnitude of change would be small within a large tidal estuary, with a large upstream catchment river catchment. Depending on the nature of the materials stockpiled and the time these remain in place, the probability of pollutants being mobilised within surface water runoff is considered to be low with standard good working practices in place, as is already the case throughout the rest of the port estate. The exposure to change would, therefore, be negligible.

The sensitivity of the River Dee with a poor chemical status to a small-scale pollution incident would be low. The vulnerability would, therefore, be none.

With a vulnerability of none and high importance, the significance is considered to be **insignificant**.

11.7.6 Potential risks to human health

There is the potential that chemical spillages pose a risk to persons on site, however, standard good practices when handling chemicals and storing chemicals means that the risk would be minimal. The magnitude of any surface water flooding as a result of increased areas of hardstanding would also be minimal with no risk to persons on site.

11.7.7 Potential impacts on climate and vulnerability of proposed development to climate change

It is anticipated that as a result of climate change, sea levels will rise and the risk of tidal flooding to the site may, therefore, increase. As stated in the FCA (Appendix 11.1), the proposed ground levels within

the site of the MEPE Project would be higher than the extreme sea levels for the 0.5 % Annual Exceedance Probability (AEP) event with an allowance for climate change. This is as requested by NRW in their Scoping Opinion (see Table 11.1).

It is also anticipated that the frequency and intensity of storms may also increase, causing the rate and volume of surface water runoff generated from the development to increase. With the appropriate management of surface water runoff within the site, however, the risk to downstream receptors will not increase as a result.

11.7.8 Risks of major accidents and/or disasters

It is considered that the MEPE Project will not cause any major flooding incidents which could result in a major accident and/or disaster.

11.8 Mitigation and residual impacts

11.8.1 Secondary mitigation

The MEPE Project does not have the potential to result in significant effects on flood risk and drainage. As a consequence, secondary mitigation measures (i.e. actions that will require further activity in order to achieve the anticipated outcome and identified as necessary through the assessment process) are not required to minimise and/or avoid significant effects beyond those already identified for the project alone.

11.8.2 Tertiary mitigation

Tertiary mitigation measures (i.e. actions that would occur with or without input from an environmental impact assessment process) will be undertaken to manage commonly occurring environmental effects. Although these are not likely to alter the assessment conclusions, they are considered to be standard good practice. In terms of flood risk and drainage, these are as follows:

- **Surface water management during operation:** Surface water runoff generated within the MEPE Project will be allowed to disperse naturally via infiltration, or else intercepted and managed within a formal surface water drainage scheme. This will ensure that surface water runoff is not able to flow freely from the site to other areas of the Port and existing MEP, minimising the risk of surface water flooding from this source;
- **Surface water management during construction:** The management of surface water runoff during construction, if required, would be incorporated into standard existing working procedures at the Port, for instance by constructing a sump or informal channel to divert runoff away from working areas; and
- **Adhering to environmental management best practice:** The safe operation during construction will be managed by ensuring that plant is properly maintained, refuelling only takes place in specified areas and a plan is put in place to manage any spillages. During operation, good working practices will continue, and will include maintaining operational plant and equipment, handling chemicals correctly and ensuring a plan is in place to manage spillages.

11.9 Summary of impacts

A summary of the impact pathways that have been assessed, the identified residual impacts and level of confidence is presented in Table 11.2

Whilst the impacts identified do not require primary or secondary mitigation measures, tertiary mitigation measures will be provided in some instances. A sustainable surface water management plan, required as part of any large development, will ensure any increases in the risk of flooding are minimised and good working practices will ensure pollution events are avoided.

Table 11.2.. Summary of potential impact, mitigation measures and residual impacts for nature conservation and marine ecology

Receptor	Impact Pathway	Impact Significance	Mitigation Measures	Residual Impact	Confidence
Construction phase					
Port of Mostyn/MEP	Increased risk of surface water flooding	Insignificant	Surface water management	Insignificant	High
MEPE construction site	Increased risk of surface water flooding	Insignificant	Site specific surface water management	Insignificant	High
Dee Estuary	Increased risk of tidal flooding	Insignificant		Insignificant	High
Dee Estuary	Mobilisation of pollutants/suspended solids	Insignificant	Tertiary – standard good working practices	Insignificant	High
Operational phase					
Port of Mostyn/MEP	Increased risk of surface water flooding	Insignificant	Surface water management	Insignificant	High
Dee Estuary	Increased risk of tidal flooding	Insignificant		Insignificant	High
Dee Estuary	Mobilisation of pollutants/suspended solids	Insignificant	Tertiary – standard good working practices	Insignificant	High

11.10 References

Water Resources, England and Wales (2017) Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

European Parliament and Council of the European Union (2018) Directive 2008/105/EC of the European Parliament And Of The Council on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council

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Welsh Government (2020) The National Strategy for Flood and Coastal Erosion Risk Management in Wales. Reference: WG40996

Welsh Government (2019) Welsh National Marine Plan. Reference: WG37346

Natural Resources Wales (2022) Dee River Basin Management Plan 2021 – 2027 Summary

Natural Resources Wales (2016) Dee River Basin District Flood Risk Management Plan 2015 – 2021 Reference: LIT 10199

Environment Agency Wales (2010) River Dee Catchment Flood Management Plan

Flintshire County Council (2011) Flood Risk Regulations 2009 Preliminary Flood Risk Assessment Report

North West and North Wales Coastal Group (2011) North West England and North Wales Shoreline Management Plan 2 Main SMP2 Document

11.11 Abbreviations/Acronyms

AEP	Annual Exceedance Probability
CD	Chart Datum
CFMP	Catchment Flood Management Plan
DAM	Development Advice Map
EC	European Commission
EEC	European Economic Community
EIA	Environmental Impact Assessment
EQS	Environmental Quality Standards
ES	Environmental Statement
EU	European Union
FCA	Flood Consequence Assessment
FRMP	Flood Risk Management Plans
HMWB	Heavily Modified Waterbody
LLP	Limited Liability Partnership
MEP	Mostyn Energy Park
MEPE	Mostyn Energy Park Extension

NPSfP	National Planning Policy Statement for Ports
NRW	Natural Resources Wales
PBDE	Polybrominated Diphenyl Ethers
PFRA	Preliminary Flood Risk Assessment
RBMP	River Basin Management Plan
SAC	Special Area Conservation
SMP	Shoreline Management Plan
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TAN	Technical Advice Note
UK	United Kingdom
WAG	Welsh Assembly Government
WFD	Water Framework Directive
WNMP	Welsh National Marine Plan

Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

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