

# **Environmental Impact Assessment Report (EIAR) – Volume 2**

## **Chapter 7 – Soils and Geology**

**Proposed ORE Capable Terminal on a 250m  
Wharf Extension & Ancillary Operational  
Support Infrastructure**

**Port of Waterford Company**

**Port of Waterford, Belview, Co. Kilkenny**



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**All appendices referenced in this document are presented in EIAR Volume III**

### APPENDICES CHAPTER 7

Appendix 7-1: Onsite Sediment Samples

## **7 SOILS AND GEOLOGY**

### **7.1 Introduction**

This chapter of the EIAR has been prepared by the MOR Environmental team. It provides a description and assessment of the potential, likely and significant effects (if any) on the geological and soil environment that can reasonably be expected to occur due to the Proposed Development. Where likely significant effects were identified, appropriate mitigation measures have been outlined to reduce or avoid these effects.

### **7.2 Methodology**

The Institute of Geologists of Ireland ('IGI') Guidelines [1] suggests a minimum 2km radius from the Site, for the study area for the Soils and Geology assessment. In line with these guidelines and in line with a review of the land, soils and geological environment, the study area was set to reflect the sensitivity of the subsurface and the presence of sensitive features which may be impacted by the Site.

However, bedrock and quaternary geology and soils are unlikely to be affected beyond the direct area of the Site, and so only conditions within and in close proximity to the Site boundary are considered. For geological heritage, erosion and landslides study area, a larger 10km radius was selected to account for any effects associated with the estuarine environment that may be influenced by the Proposed Development, e.g. coastal / tidal erosion.

In order to determine the baseline environment, a desk-based study was undertaken to collect and review background information. A site walkover was carried out to supplement these desk-based findings. Sediment sampling and analysis was also completed to inform this assessment.

#### **7.2.1 Guidance Documentation**

The importance / sensitivity of the geological receptors within the Site were assessed on completion of the desk study as set out in Table 3-4 of the EPA's 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' [2]. These Guidelines are formally adopted and published by the EPA [2].

In addition to the EPA Guidelines, the assessment was carried out in accordance with the following guidance and tailored accordingly based on professional judgement:

- Institute of Geologists Ireland ('IGI') Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements [3];
- Institute of Environmental Management & Assessment ('IEMA') Guide: A New Perspective on Land and Soil in Environmental Impact Assessment [4];
- OSPAR - Guidelines for the Management of Dredged Material [5];
- European Commission Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment [6]; and,
- Marine Institute Guidelines for the Assessment of Dredge Material for Disposal in Irish Waters [7].

#### **7.2.2 Desk-based Study**

A desk-based study of the Site was conducted using available geological information held by the Geological Survey of Ireland ('GSI') and the EPA for the general area and all available site-specific information. The following sources were reviewed for this purpose:

- GSI Public Data Viewer [8];

- EPA Online Mapping [9];
- Port of Waterford Masterplan [10];
- Irish National Seismic Network [11];
- Port of Waterford Strategic Environmental Assessment ('SEA') Environmental Report [12]; and,
- Historic site investigation results.

### 7.2.3 Site Investigations

The investigations undertaken as part of this assessment included the collection of sediment samples within the Site between the 20<sup>th</sup> and 21<sup>st</sup> April 2023, in order to assess the quality and physical characterisation of the sediment within the Lower Suir Estuary. Sampling locations are shown in Figure 7-1 below.

**Figure 7-1: Sediment Sampling Locations**



SOCOTEC Environmental Chemistry collected seven samples at representative locations within the Site (MPSS1 to MPSS7), within the Lower Suir Estuary (see Appendix 7-1). An accredited laboratory conducted physical grain size analysis on the collected samples, determining the sediment classification based on grain size and type.

An accredited laboratory also undertook geochemistry of sediments and leachate testing on the samples. This laboratory analysis was used to assess criteria for possible reuse on-site or removal off-site to licensed waste facilities in accordance with the EPA's Waste Classification List [13]. Parameters for leachate samples are compared to Waste Acceptance Criteria ('WAC') [14] to establish if the material would be suitable for landfills.

## **7.3 Receiving Environment**

### **7.3.1 Historical Land Use**

According to the GSI historical maps [8], the Site was previously used for industrial and agricultural purposes. Prior to the construction of the current port, the area consisted of various mills and farmlands, including a corn and flour mill with an adjacent pond that has since been removed, with the land now being part of the current port. As a consequence of the changing face of the landscape, much of the historical land use in the immediate area of the port was significantly altered. The first significant changes to land use and transportation came in 1918 when the Rosslare-Limerick railway line was built on the only accessible flat strip of land along the north bank of the Lower Suir estuary. The Port of Waterford itself was opened in 1993 at the Belview location.

### **7.3.2 Current Land Use and Site Description**

The Site covers an area of ca. 8ha and is located partly on land and partly in the Lower Suir Estuary within the industrial landscape of the Port of Waterford, Belview, Co. Kilkenny (see Figure 1-2 in Chapter 1). The Site is accessed via local road L7852 off the N29 national road. The Site is bordered to the north and west by a primarily industrial landscape, and within the wider area are the sites of SmartPly Europe, Southeast Port Services Ltd., Target Fertilisers, and the wider Belview Port area. Detailed information on the Site is provided in Chapter 1 of this EIAR.

### **7.3.3 Topography**

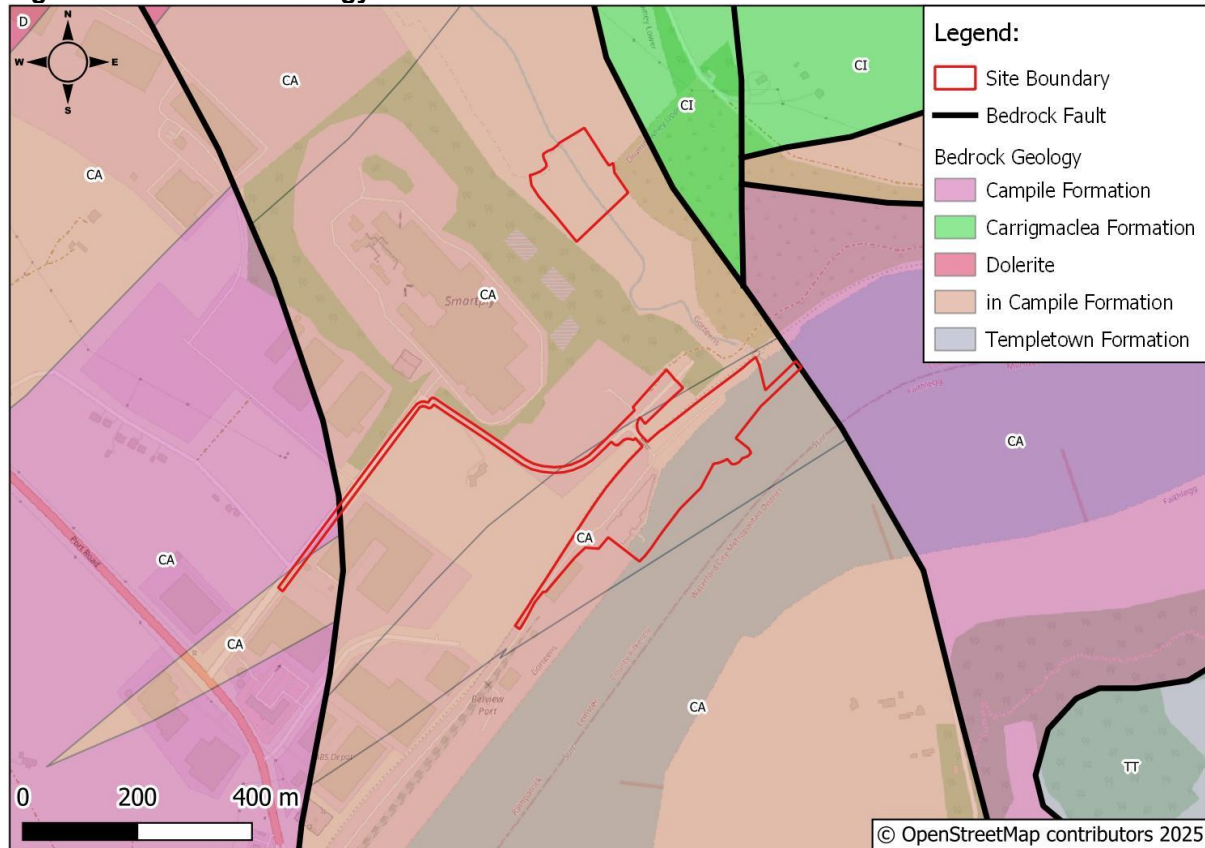
The Site slopes steeply to moderately in a north to south direction at an average approximate slope of 11.85% (1 to 8.44). Existing ground elevations at the location of the Site range from approximately 35.36mOD (Poolbeg) at the northern boundary of the Site to 5.58mOD (Poolbeg) at the location of the existing wharf facility adjacent to the south-eastern boundary of the Site. The existing Port quay is predominantly flat with no evident slope.

The land on the adjoining stretch of the northern bank of the Lower Suir Estuary once rose steeply above the river channel, but this topographical situation was gradually altered, most significantly by the creation in 1918 of the railway line running along a strip of land between the high-water mark and the rising ground. Quarrying that took place in Snowhill to source rock for the original Port construction and a previous quay extension has also altered the adjoining topography.

### **7.3.4 Bedrock Geology**

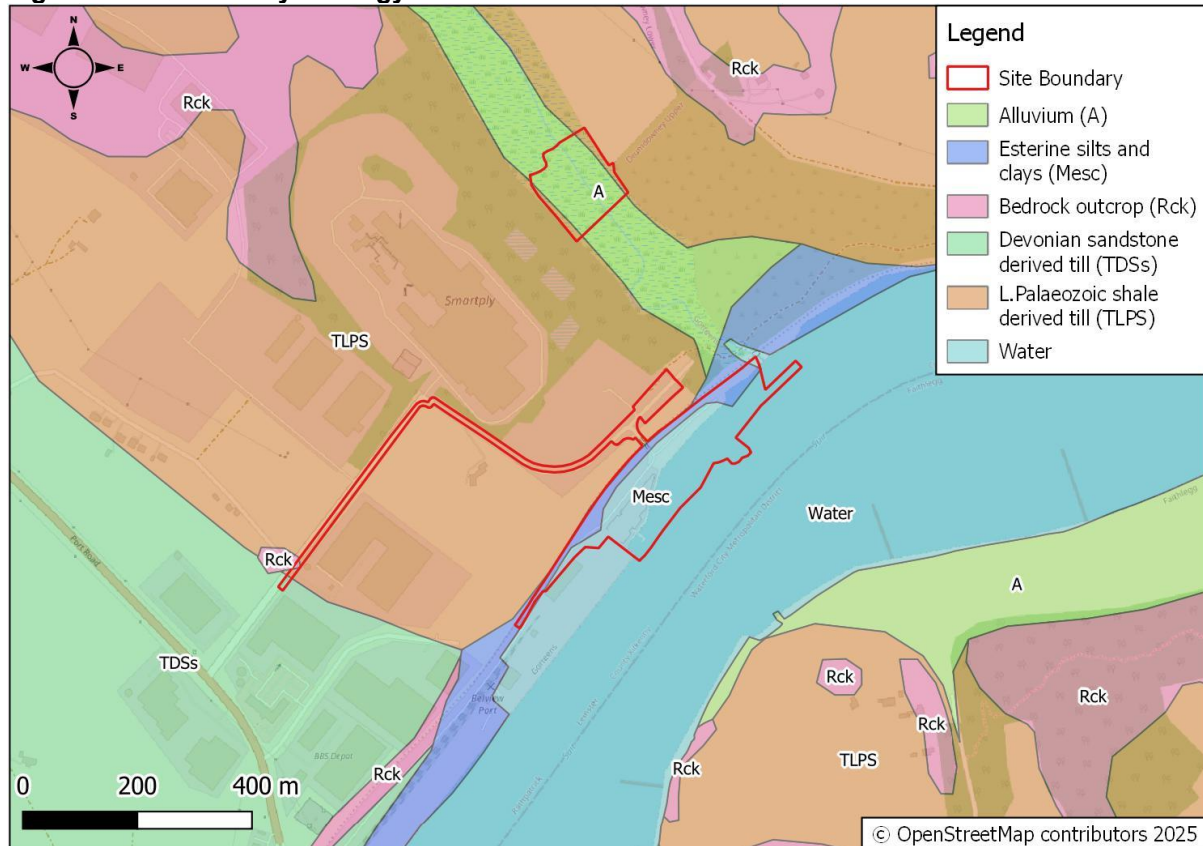
According to GSI mapping [8], the bedrock beneath the majority of the Site comprises Ordovician Felsic volcanic rocks, including Rhyolite, Rhyolitic tuff and slate referred to as the Campile Formation and, in the northeast, intermediate volcanics of the same formation, as shown in Figure 7-2 below.

The areas of the Site contain heavily faulted bedrock.

**Figure 7-2: Bedrock Geology**

### 7.3.5 Quaternary Geology

According to the GSI database [8], the majority of the Site is located within the Lower Suir Estuary, with the western coastline of the estuary comprised of Quaternary sediments derived from Estuarine silts and clays. The north and northwestern region of the Site contains till derived from Lower Palaeozoic shales, and the westernmost boundary tip of the Site contains tills from Devonian sandstones, as shown in Figure 7-3 below.

**Figure 7-3: Quaternary Geology**

### 7.3.6 Geological Heritage

According to GSI mapping [8], the area of the Site does not lie within or adjacent to any County Geological Sites ('CGS'). Two sites of Irish Geological Heritage ('IGH'), comprising unique geological features, are identified within a 10km vicinity of the Site. See Table 7-1 and Figure 7-4 below.

**Table 7-1: IGH Sites Within 10km of the Site**

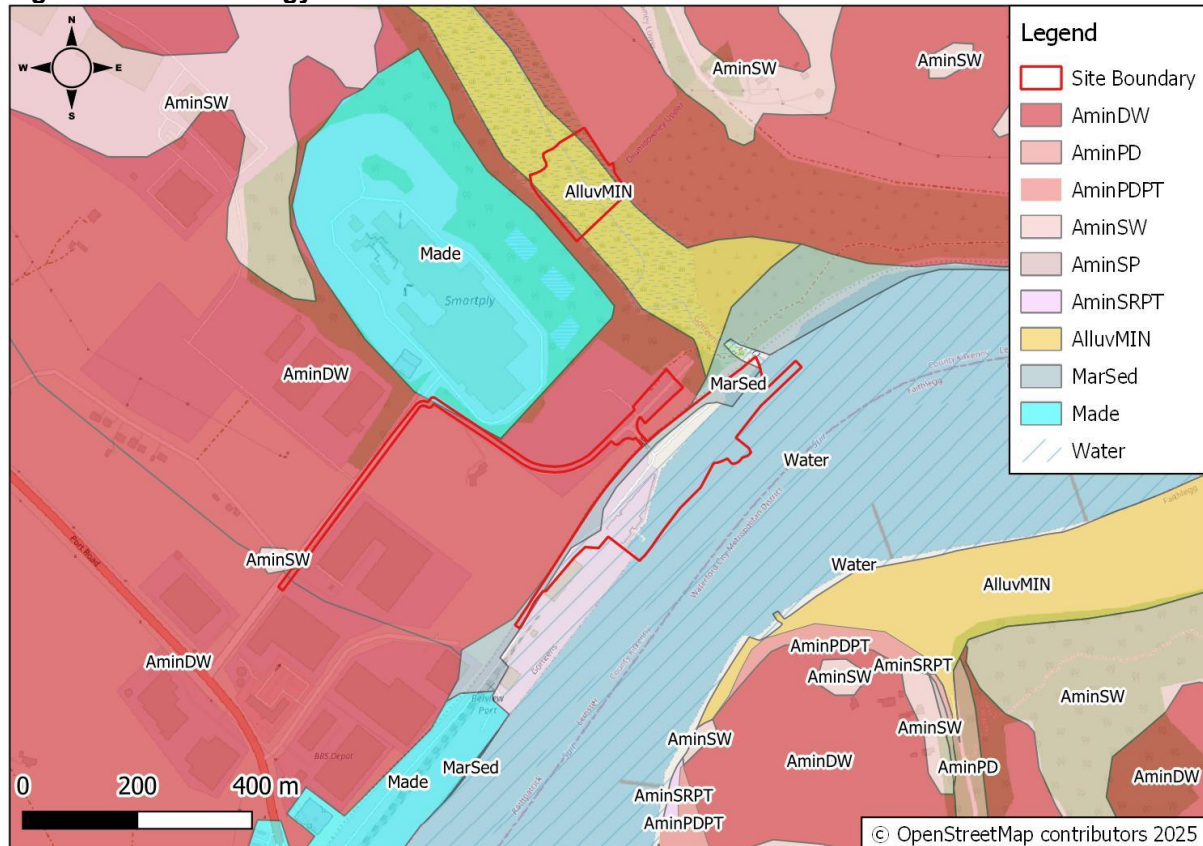
Name	Site Code	Distance from Proposed Development	IGH Description
Newtown	IGH7	6.2km SE	A low coastal cliff section that extends for c. several hundred metres and is c. 6m-8m high.
Granny Quarry	IGH8	9.56km NE	A disused quarry.



**Figure 7-4: IGH Sites Within 10km of the Site**

### 7.3.7 Soils

According to the GSI database soil map [8], the southern and southeastern edges are predominantly located within the Lower Suir Estuary and characterised as 'Water'. There is an area of AminDW soil (deep, well-drained mineral (mainly acidic)) located in the western area of the Site, which corresponds to the areas identified as Lower Palaeozoic shale-derived till in Section 7.3.4. A small, thin, linear area of the Site between the water and the AminDW soil, which makes up the coastline of the Lower Suir Estuary, is composed of MarSed (marine / estuarine sediments) that correlate with the areas of estuarine silts and clays in Section 7.3.4. Along the northwestern edge of the Site is a thin region of Made ground which also borders the area of the Site in the central, northern area. The westernmost area of the Site contains a small area of AminSW (shallow, well-drained mineral (mainly acidic)). Refer to Figure 7-5 below.

**Figure 7-5: Soil Geology**

### 7.3.8 Coastal Erosion

As stated in Section 7.3.5, the banks of the Lower Suir Estuary within the vicinity of the Site are composed of unconsolidated soft sediments (silts and clays), leaving these areas susceptible to coastal erosion. According to the EPA [15], coastal erosion may include:

- Increased or rapid cliff retreat;
- Increased sedimentation within the Lower Suir Estuary;
- On-land movement of dunes and other barriers; and,
- Sediment loss on beaches.

More severe weather events, including storm surges, are a natural risk to coastal soils.

### 7.3.9 Historic Landslides and Landslide Susceptibility

According to the GSI landslide susceptibility map [8], there is no recorded evidence of landslides within the vicinity of the Site. The nearest recorded landslides are located ca. 6.0km west of the Site, within the Waterford (Plunkett) train station boundary, in Mountmisery, Co. Waterford, along the northern section of the Lower Suir Estuary. The most recent event at this location occurred on 31<sup>st</sup> December 2013, and another event occurred on 1<sup>st</sup> January 1989, emanating from the top of a large rock outcrop.

The GSI classifies the area within the Site as having a landslide susceptibility rating of low risk [8]. Between the Site and the River Barrow mouth, a 1.1km section of land is characterised as having low to moderately high susceptibility for landslides. Locations within the vicinity of the Site that have a higher risk for landslides are related to geomorphological features, including waterbody outlets into the Lower Suir Estuary, river bars and capes. Increased landslide risks

in these areas directly correlate to areas of high sedimentation concentrations and high erosional rates.

### 7.3.9.1 Underwater Landslides

Seismic events such as underwater landslides occurring offshore along faults in the seabed have the potential to trigger larger-than-average tidal waves. Tidal waves travel inland and may increase damage to coastal infrastructure and increase erosion along coastlines [12]. According to the Irish National Seismic Network ('INSN') [11], historic underwater earthquakes have occurred within the Irish Sea, situated ca. 50km west of the Site, as well as within the Northern Atlantic Ocean to the south. Historic earthquakes were below 3.0 magnitude on the Richter scale and considered moderate. Due to the area of the Site being located upstream, a significant distance from the open ocean, and protected by the estuary, the potential for damage from seismically induced tidal waves is considered low [12].

### 7.3.10 Site Investigations

The analytical analysis of the seven sediment samples within the Site determined that the grain size ranged from very coarse silt to very fine gravel and poorly sorted to extremely poorly sorted. The sample results indicated that the area of the Site was predominantly comprised of silt and sand (sandy mud), with one sampling location (MPSS5) comprised largely gravel (muddy gravel). The particle distribution (grain size) of the samples analysed is shown in Table 7-2 below.

**Table 7-2: Physical Analysis of Soil Samples**

Sample Location ID	Gravel (>2mm) %	Sand (63-2000µm) %	Silt (<63µm) %	Textural Group Classification
MPSS1	0.00	38.53	61.4	sM : Sandy Mud
MPSS2	0.00	49.79	50.21	sM : Sandy Mud
MPSS3	0.00	55.07	44.93	mS : Muddy Sand
MPSS4	13.63	45.35	41.02	gmS : Gravelly Muddy Sand
MPSS5	59.88	19.95	20.17	mG : Muddy Gravel
MPSS6	0.00	40.85	59.15	sM : Sandy Mud
MPSS7	0.00	39.58	60.42	sM : Sandy Mud

Chemical analysis of soil samples was undertaken to assess their compliance with the WAC for disposal at licensed waste facilities, in the event that reuse on-site is not feasible. The analytical results were compared against the limit values for:

- Inert Waste Landfill;
- Stable Non-Reactive Hazardous Waste disposed of in Non-Hazardous Landfill; and,
- Hazardous Waste Landfill.

The results are summarised as follows:

Chloride concentration in sample MPSS1 was reported at 806 milligrams per litre (mg/l), which marginally exceeds the limit for disposal at an Inert Waste Landfill (800 mg/l), but remains below the threshold for Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill (15,000 mg/l).

All other parameters in samples MPSS1 through MPSS7 were found to be within the applicable WAC thresholds for inert landfills.

## **7.4 Characteristics & Potential Effects of the Proposed Development**

The Proposed Development will entail the extension of the existing wharf. This change will involve two distinct phases in relation to geology and soils:

- Construction Phase:
  - A 250-metre extension to the existing wharves at the container / bulk handling terminal at Belview Port, as a continuation of the existing wharves, comprising a reinforced concrete suspended deck supported on reinforced concrete beams and steel piles with the structure extending into the Lower River Suir SAC and partly on land with a retaining structure to the rear;
  - Demolition of downstream access ramp;
  - Stockpiling and removal of demolition waste;
  - Hard landscaping;
  - Capital dredging of the Lower Suir Estuary adjacent to the existing wharf;
  - Piling into the bedrock within the Lower Suir Estuary adjacent to the existing wharf;
  - Excavation works including foul main trenching, excavation relating to foundations for a new structure in the northern section of the Site;
  - Land reclamation, covering an area of ca. 1.3ha using reclaimed material and quarried rock; and,
  - Biodiversity Enhancement Area (1.8ha) located to the northeast of the wharf extension in existing agricultural wet grassland that is bisected by the Luffany Stream.
- Operational Phase:
  - Fuel tank stations for CTVs and SOVs;
  - ORE operations; and,
  - Extension of existing Port operations.

These two phases have been dealt with separately as the effects associated with each are distinct.

### **7.4.1 Construction Phase**

The construction works are planned to begin in Q3 2026 and will take ca. 18-24 months to complete. Excavation and on-site management of dredged materials, excavated topsoil, and subsoil have the potential to impact land, soils and the geological environment.

#### **7.4.1.1 Capital Dredging – Reuse of Dredged Material**

Capital dredging will be required at the downstream end of the wharf extension to achieve the proposed berth depth of -10mOD Poolbeg. There will be a need to remove ca. 7,000m<sup>3</sup> of material from the riverbed to facilitate the construction of the wharf extension. The dredging works will be carried out using appropriate dredging methods and equipment to loosen the compacted material. Loading will take place under controlled conditions, with material removed from the bed transferred by a suction pipe directly to the vessels' holding tanks.



In minimising the off-site removal of dredged material, and to support the circular economy, it is proposed to reuse the dredged materials within the Site [10]. The Guidance on the Beneficial Use of Dredge Material in Ireland (2013) [16], specifies beneficial reuses of dredged material and suitability based on soil characterisation in Table 7-3 below.

**Table 7-3: Dredged Material Use and Suitability**

		Dredged Material Suitability Based on Characterisation									
Category of Beneficial Use	Type of Beneficial Use	Uncontaminated	Contaminated	Freshwater	Saltwater	Soft Clay	Silt – Soft clay	Sand – silt	Consolidated Clay	Gravel – Sand	Rock
Engineering Uses	Beach Nourishment	✓	X	✓	✓	X	X	X	✓	*	*
	Land Reclamation	✓	*	✓	✓	✓	*	✓	✓	✓	✓
	Landfill Cover	✓	*	✓	✓	✓	✓	✓	X	X	X
	Coastal Protection	✓	✓	✓	✓	X	X	✓	✓	✓	✓
Environmental Enhancement	Wetland Habitat Creation & Enhancement	✓	X	✓	✓	*	*	✓	✓	✓	X
Agricultural / Product Uses	Concrete Manufacture	✓	*	✓	*	X	✓	✓	X	✓	X

Note \* Dredged material partially suitable, ✓ suitable, X not suitable.

Soil characterisations outlined from laboratory analyses detailed in previous sections of this chapter classified material in the vicinity of the Site as uncontaminated, predominantly sand and mud with some areas of mixed gravel and soft sediments. Therefore, as much as practicable, all dredged material will be reused for land reclamation within and adjacent to the area of the Site. As these will be capital dredging works associated with the Proposed Development, they will not be subject to the conditions of the Dumping at Sea permit Reg. No. S0012, issued by the EPA, that currently regulates the maintenance dredging operations undertaken by Port of Waterford. Capital dredging will have a potentially temporary negative effect on geology, ranging from imperceptible to moderate.

#### 7.4.1.2 Land Reclamation

There will be a need to reclaim land during the Construction Phase. Rock will infill the area behind the open wharf and will be brought up to the same level as the wharf. This will require the importation of approximately 160,000 tonnes of rock from a local quarry to the Site. The rock will be carefully selected and tested to ensure it meets the required specifications for

engineering fill, including size, compaction properties, and chemical stability. Where possible, the quarried material sourced will be compatible with the material at the Site to promote structural stability and ecological integration.

The infill material will then be systematically placed in the designated area using heavy machinery, with care taken to minimise disturbance to the riverbed and surrounding marine environment.

### 7.4.1.3 Piling Works

Given the location of the Proposed Development, there will be a significant amount of piling works required during the construction works. The main piling works will be associated with the construction of the suspended deck wharf extension, as this will have piled foundations. There will be a need to install ca. 220 steel piles to support the quay extension. There will also be a need to install ca. 20 steel piles to support a piled foundation for the two pontoons. These works will most likely be undertaken from a barge positioned near the shoreline, although this will only be confirmed during the detailed design stage. These piling works will result in localised temporary disturbance of fluvial sediment. The buildings will also need to have piled foundations. Based on current design information, these will be driven piles that will be installed using standard piling rigs. Summary details on the piles to be installed as part of the Proposed Development are presented in Table 7-4.

**Table 7-4: Piling Characteristics and Design**

Location	Pile Type	Est. Total Pile Quantity	Est. Thickness (mm)	Preliminary Est. Depth (m)
New Wharf Plan	Rock Socketed Steel Pile	220	762 / 29	20 - 45
Pontoons	Rock Socketed Steel Pile	20	500 - 600	20 – 30
ORE Buildings	Driven Concrete or Steel Piles	120	300 - 400	20 – 30

### 7.4.1.4 General Construction Activities

There will be limited demolition works. The existing ramp within the northern area of the Site will need to be demolished. The ramp consists of hardstanding material, soils and permanent to semi-permanent barrier structures. It is estimated that ca. 3,000m<sup>3</sup> of material will be removed during demolition. Reusable material will be stockpiled and utilised as infill as part of the reclamation works. Where required, material sourced from the demolition works and the dredged arisings will be mixed with imported stone and placed in compacted layers, in accordance with the Engineer's specifications.

General construction works will include the excavation of ca. 2000m<sup>3</sup> of materials for the construction of substructures, including building and the installation of underground services. Excavated materials will be predominantly comprised of soils and subsoils. Every effort will be made to reuse these materials on-site; however, as these works will be undertaken following the bulk reclamation works, the scope for on-site reuse will be minimised. Any such surplus materials will be removed off-site in strict accordance with all requirements of the Waste Management legislation [13].

These excavation works have the potential to disturb contaminated ground and spread contamination to clean ground. The excavation of material on-site will potentially have a negative effect on soils and geology, ranging from imperceptible to moderate, depending on the magnitude of any soil contamination.

Construction works will involve the pouring of concrete throughout the work zones, specifically within and around the proposed structures. The foundations and floor slabs will be constructed with large quantities of reinforcing steel, which will be delivered to the Site with some of the reinforcing cages, perhaps being prefabricated off-site, delivered and craned into position. There will be large concrete pours for various elements of the structures, including pile caps, ground beams and the ground floor slabs / yard slabs, which will be poured in sections according to an agreed phasing plan for the works. It is proposed that ca. 5,845m<sup>2</sup> of concrete slabbing will be used during construction works at the Site.

Construction activities may have associated risks of accidental spillages of contaminating substances, such as waste oil, fuel or chemicals, directly onto soils or onto other substrates with subsequent transfer to soils. Such occurrences may constitute a negative, short-term direct or indirect impact on the receiving environment that ranges from imperceptible to moderate, depending on the magnitude of spillages or leaks. Proper mitigation measures will be implemented to minimise these risks and protect the environment; refer to section 7.5.1.

The existing soils within the landside portion of Site are predominantly influenced by human activities and are therefore not particularly sensitive to disturbance from construction or excavation activities. As a result, any potential negative impacts on the underlying soils at the Site have been predicted to be short-term in duration and range from imperceptible to slightly negative effect in significance.

The disturbance of the sediments within the river, primarily during the capital dredging and piling works, has been predicted to be short-term in duration and have a slightly negative effect in significance.

Therefore, the Construction Phase mitigation measures outlined in Section 7.5 will be employed to reduce potential impacts from construction activities.

## **7.4.2 Operational Phase**

During the Operational Phase, there will be no emissions or other activities with a potential to affect land, soils or geology.

## **7.4.3 Unplanned Events**

### **7.4.3.1 Storm Surges**

Unplanned events include storm surges that may result in increased erosion along the coastline near the Proposed Development. Storm-related increases in tides, wave energy and wind may increase erosional processes along the banks of the Lower Suir Estuary and at the outlet of the River Barrow. Increases in erosion or possible landslides correlate with increased suspended solids within the surrounding waterbodies.

### **7.4.3.2 Oil Storage / Refuelling**

As part of the Proposed Development, there will be two fuel tanks, each storing up to 90,000L of marine gas oil. These will be located on the Wharf adjacent to the Quay. This fuel will be used for the refuelling of SOVs and CTVs. The two tanks will be located within two separate bunds that have been appropriately designed in accordance with recognised best practice guidance [17]. The refuelling area will also be contained. The storage of such fuels poses a potential risk to land and soils, with possible hydrocarbon releases resulting in a significant negative effect on exposed geology and soils. The employment of good environmental management practices by the ORE operators will also serve to minimise the risk of pollution from these storage and refuelling operations.

## **7.5 Proposed Mitigation Measures and/or Factors**

### **7.5.1 Construction Phase**

Prior to the commencement of construction, the Construction Environmental Management Plan ('CEMP') submitted with this application will be updated by the Contractor, with detailed construction phase mitigation measures, including those listed in this EIAR and the NIS submitted with this application.

#### **7.5.1.1 Land Reclamation**

In order to minimise the impacts on land and soils during the land reclamation works, the following measures will be implemented:

- The imported engineering fill will be processed on-site at the source quarry, where it will be crushed and graded to achieve uniform size and washed to remove fine particles that could otherwise contribute to increased turbidity or sediment dispersion during placement;
- Analytical testing will also be conducted to confirm that the engineering fill materials will not introduce harmful elements;
- Engineering fill materials will be unloaded using controlled methods to avoid accidental spillage into the marine environment;
- Placement of the engineering fill materials will occur gradually, with continuous up- and downstream monitoring of water quality parameters, such as suspended solids (or a turbidity as its proxy) and pH, to ensure compliance with environmental thresholds; and,
- Adaptive Management [18] of these reclamation works will be implemented. This approach will be based on modelling-monitoring-adaptation. In practice, this means that if any environmental thresholds are significantly exceeded, additional mitigation measures will be considered.

#### **7.5.1.2 Oil Storage / Refuelling**

In order to minimise the impacts on land and soils from potential spillages during the Construction Phase, the following measures will be implemented:

- All plant and machinery will be serviced before being mobilised to the Site;
- All plant, machinery and construction vehicles will be inspected regularly for oil leaks, in accordance with the measures listed in the final CEMP prepared by the Contractor;
- All oil stored on-site for construction vehicles will be kept in a locked and bund-protected area;
- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment;
- Drip trays will be used for fixed or mobile plant, such as pumps and generators in order to retain oil leaks and spills;
- Refuelling of plant and machinery will be completed in a controlled manner using drip trays (bund container trays). Fuel containers will be stored within a secondary containment system, e.g. bunds for static tanks or a drip tray for mobile containers. Bunds for the storage of hydrocarbons and chemicals will have a holding capacity of 110% of the volume to be stored. In addition, an emergency spill kit with oil boom, absorbers, etc., will be kept onsite in close proximity to any fuel storage tanks or bowsers for use in the event of an accidental spill;



- Fuel and oil stores, including tanks and drums, will be regularly inspected for leaks and signs of damage;
- All deliveries to onsite oil storage tanks will be supervised. Records will be kept of delivery dates and volumes;
- Only designated trained operators will be authorised to refuel plant on-site;
- The Site manager shall ensure that all personnel working on-site are trained and aware of the mitigation measures detailed within the EIAR;
- Procedures and contingency plans will be set up to deal with emergency accidents or spills;
- A procedure will be drawn up, which will be adhered to during the refuelling of on-site vehicles. This will include the following:
  - Fuel will be delivered to plant on-site by a dedicated tanker or in a delivery bowser dedicated to that purpose;
  - In the case of a bowser, the driver or supervising foreman will check the delivery bowser daily for leakage;
  - The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
  - Where the nozzle of a fuel pump cannot be placed fully into the tank of a machine, then a funnel will be used; and,
  - Each area of work will have a designated fuelling area. Section foremen shall identify these areas to their plant operatives;
- All equipment associated with the storage of fuel on-site will be designed and installed to relevant standards; and,
- All valves will be of steel construction, and the open and close positions, will be clearly marked.

Mitigation measures for the prevention of soil contamination during all stages of the Proposed Development are stated below. Specifically with regard to soils, the following will be adhered to:

- Items of plant unsuitable for travelling to the refuelling area (dry screening plant) will be refuelled utilising adequately sized and positioned drip trays;
- Spill kits will be available adjacent to all refuelling and fuel storage operations;
- Spill kits will be available on the barge during the piling works – if applicable;
- Fuel, chemical and oil storage areas on-site will be bunded in compliance with EPA guidance (2004);
- Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best practice codes;
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling;
- Any spillage of fuels, lubricants, hydraulic oils, explosives or other chemicals will be contained as soon as practicable; and,

- The proposed design incorporates multiple protective measures, including overfill protection on tanks, full bunding of storage areas, a forecourt interceptor, continuous monitoring, and provision of an emergency holding tank.

#### **7.5.1.3 Soil Management / Stock Piling**

Stockpiling of excavated material will be appropriately managed on-site during the Construction Phase. To minimise the overall impact on soils arising during the construction works, the following mitigation measures will be adhered to:

- Temporary berms will be constructed around stockpiles to prevent run-off during rain events;
- Stockpiles will be dampened down during dry periods to prevent wind dispersion;
- The stockpiles will be clearly segregated, one for reuse in berms, one for reuse in soil stabilisation, and another segregated for off-site disposal; and,
- All stockpiles will be maintained at a minimum distance of 20m from the Lower River Suir Estuary.

Specific control measures will be specified in the Resource Waste Management Plan ('RWMP') for the handling and temporary storage of any potentially contaminated materials that may be encountered during the works. RWMP will be prepared by the Contractor and submitted to the Planning Authority prior to the commencement of the construction.

#### **7.5.1.4 Cement Handling During Construction**

The measures detailed below will be employed when poured concrete is used in construction. Concrete will be used for various elements of the piling and foundation structures. The production, transport and placement of all cementitious materials will be strictly planned and supervised. Measures related to the use of poured concrete will include:

- All concrete pours will be planned with risk assessment to avoid any impacts;
- Full washing out of trucks and other equipment will occur at the dedicated contained area;
- Water supply points, if required, will be agreed with the appointed Contractor in advance of the works;
- Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;
- Chemicals used will be biodegradable where possible;
- Any spillages will be cleaned up immediately and disposed of as per the Waste Management Act [19];
- Where concrete will be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening; and,
- Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete.

#### **7.5.2 Operational Phase**

During the Operational Phases of the Proposed Development, the ORE Operator Facilities will operate under environmental management procedures that are in line with the current POW procedures. The ORE Operators will prepare and provide these to the POW in advance of operations. In addition, the port extension area will be operated in accordance with the Port

of Waterford's environmental management procedures, as set out under its ISO 14001–certified EMS.

The following mitigation measures will be employed to prevent any potential impact on soils and geology:

- The integrity and water-tightness of underground pipes, tanks, bunds and containers will be checked at regular intervals in accordance with relevant guidelines;
- Suitable absorbent materials will be kept on-site to deal with any spills; and,
- Loading and unloading of fuels will be carried out in an area protected against spills and runoff in accordance with relevant EMS procedures.

## **7.6 Cumulative and In-Combinations Effects**

The Port of Waterford has an ongoing maintenance dredging programme that includes primarily areas directly related to trade vessels (berths) and access to the Port of Waterford (navigational channel); however, it also includes areas that are maintained for smaller harbour users, such as Cheekpoint Harbour, which is a community harbour facilitating local fishing and recreational vessels. Whilst the primary purpose of this maintenance dredging is to maintain the Port's infrastructure to navigationally safe levels, the secondary purpose is to assist the numerous other estuary users in maintaining their marine facilities. The EPA strictly regulates these works under the Port's current 8-year Dumping at Sea Permit (S0012-03) that runs until the end of 2025. There is currently an application with the EPA for a new permit covering the period between 2026-2033 inclusive. The Dumping at Sea application currently under consideration does not include the capital dredging associated with the Proposed Development, as it is currently only focused on continued maintenance dredging critical to the Port of Waterford's ongoing operation. The capital dredging required for the Proposed Development will be localised and reasonably short in duration. Therefore, as the assessment on the Site has shown no likely significant effects on soils and geology, the cumulative effects arising from the ongoing maintenance dredging works were determined to be not likely and not significant.

## **7.7 Interactions with Other Environmental Attributes**

Land and soils interact with other environmental attributes as follows [20]:

- Chapter 6 (Biodiversity). Potential impacts on the underlying soils and geology could also impact on water quality and therefore ecological aquatic ecology. The capital dredging and land reclamation works have the potential to produce siltation that could impact ecological conditions. However, given that there will be no significant effect on soils and geology or water quality due to the mitigation measures, there will be no significant effect on biodiversity;
- Chapter 8 (Water). The removal of the soils will alter the sensitivity of the underlying groundwater / surface water bodies. Additionally, dredging and land reclamation works could release suspended solids and other material into the regional waterbodies and groundwater. Further assessment and the effects on water quality are addressed in Chapter 8, which shows no significant effects;
- Chapter 9 (Air). The mobilisation of land, soils and geology through demolition and construction processes can affect air quality. The effects on air quality are addressed in Chapter 9, as not significant;
- Chapter 10 (Climate). Coastal erosion is correlated to increased risk of landslides and loss of agricultural land. The effects of climate on the Proposed Development are addressed in Chapter 10, including landslides. No significant effects were determined;

- Chapter 13 (Landscape & Visual). The modification of local geomorphology and topology through the extraction of the riverbed and bedrock on land and within the Lower Suir Estuary will likely impact the visual and landscape character of the area. Coastal erosion may affect scenic natural landscapes in the area. The effects on visual and landscape character are addressed in Chapter 13; and,
- Chapter 17 (Material Assets – Energy, Natural Resources and Waste). The potential reuse of future demolished material will be limited. Material that cannot be reused onsite will be removed offsite as waste in strict accordance with all relevant Waste Management legislation. Refer to Chapter 17 for further details.

## **7.8 Indirect Effects**

There have been no significant or likely indirect effects identified outside of those previously assessed throughout this chapter.

## **7.9 Residual Effects**

Implementation of the mitigation measures will ensure that any effects arising from both the Construction Phase and the Operational Phase of the Proposed Development will be not likely and not significant.

## **7.10 Monitoring**

Not applicable.

## **7.11 Reinstatement**

Not applicable.

## **7.12 Difficulties Encountered in Compiling this Information**

No difficulties were encountered when compiling this information.

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