Alexandra Basin Redevelopment 2

Bringing Dublin Port To 2040

Environmental Impact Assessment Report

Chapter 5 Project Description

Volume 2



CALAFORT ÁTHA CLIATH
DUBLIN PORT

TETRA TECH

5 Project Description

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5.1 Introduction

The EIA Directive states that an EIAR must include:

> *"a description of the project comprising information on the site, design, size and other relevant features of the project".*

Section 3.5.1 of the EPA EIAR Guidance (2022) states:

> *"…it is appropriate for most EIARs to include (to varying degrees of detail) a description of:*
> - *the location of the project*
> - *the physical characteristics of the whole project, including, where relevant, demolition works, the land-use requirements during construction and operation and other works that are integral to the project*
> - *the main characteristics of the operational phase of the project (production and maintenance processes in particular), for example energy demand, energy used, nature and quantity of materials and natural resources (including water, land, soil, biodiversity, etc.,) used*
> - *an estimate, by type and quantity, of the expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation, and quantities and types of waste produced during the construction and operational phases)."*

Accordingly, this chapter of the Environmental Impact Assessment Report (EIAR) describes the ABR2 Project and contains information on the site, design, and other relevant features, in order to establish the characteristics of the project for the purposes of environmental assessment. The chapter sets out the site location and the existing site usage within the development area, including adjacent land usage. Thereafter, given the marine nature of much of the proposed works, the elements of the proposed development comprising the Project are then described, with a particular focus on the elements of dredging and the remediation and reuse of contaminated dredge material. The Project description set out in this chapter is based on the final project concept derived from careful evaluation of various potential alternatives as set out in **Chapter 4 Assessment of Alternatives**.

The proposed construction sequence is described. Comprehensive information is provided in relation to, *inter alia*, working areas, hours of work, principal construction methods and phases, volumes of materials, traffic and an overview of environmental controls.

The operational phase of the development is considered, followed by a description of the potential risk of major accident hazards, decommissioning and, finally, an identification and summary description of other projects with potential for cumulative environmental effects.

This chapter provides a level of detail so as to enable the competent authority to conduct an examination of the information presented in the EIAR and to assess the significant effects of the Project on the environment in compliance with its obligations under the EIA Directive (Directive 2011/92/EU) as amended, whilst being

accessible to readers without technical expertise. It should be noted that specific technical detail of elements of the project is included in the Planning Drawings that accompany this EIAR.

5.2 Location of the Project

5.2.1 Site Location

Dublin Port is the largest port in Ireland, situated on Ireland's eastern coastline, as shown in **Figure 5-1**. The South Estate of Dublin Port comprises 58ha. The North Estate of Dublin Port comprises 207ha. The entirety of the works proposed in the ABR2 Project are located on the North Estate and are primarily marine activities located in and around existing basins, involving capital dredging and the remediation and reuse of contaminated dredge material.

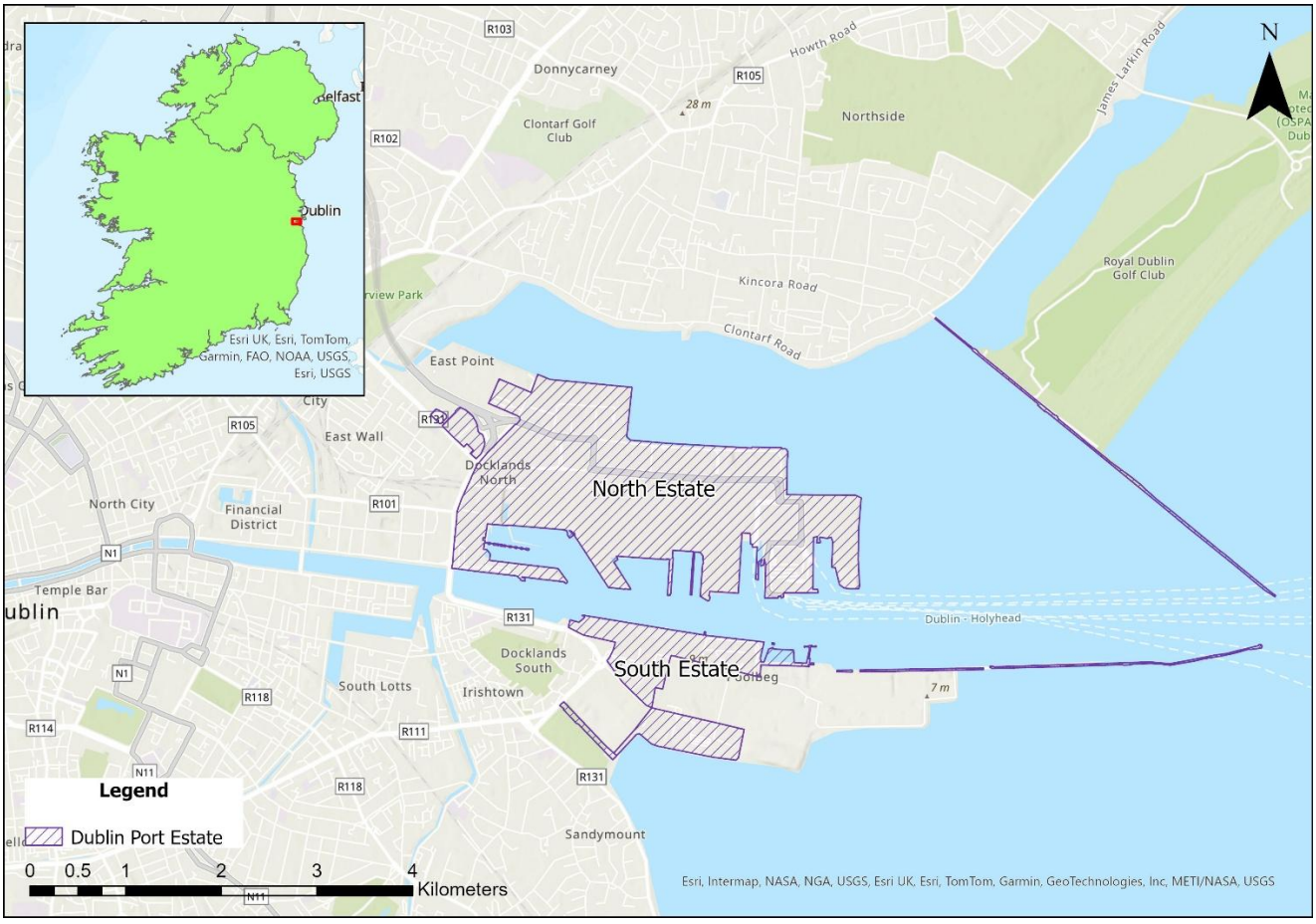


Figure 5-1: Location of Dublin Port

5.2.2 Development Areas

The area of the Project for which planning permission is sought is defined by the 'red line' application boundary as illustrated on the application drawings and, in the context of the existing port layout is presented in **Chapter 1 Figure 1-3**.

The area of the proposed project for which planning permission is sought is defined by the 'red line' application boundary as illustrated on the application drawings and, in the context of the existing port layout is presented in

Chapter 1 Figure 1-3. The area enclosed by the planning application boundary is 72.6ha within the North Estate. It should be noted that the red line application boundary and the study area boundary of the ABR2 Project encompass slightly different areas, with the study area boundary reflecting the movement of barges of dredged/treated sediment material along the navigation channel.

In line with the objectives of the Dublin Port Masterplan 2040, development pursuant to a number of permitted projects has already been completed (ABR Project), are ongoing (MP2 Project) or are planned (3FM Project) for Dublin Port. The first of these projects in time was the ABR Project, for which permission has now expired. The works already completed under the permission granted in respect of the ABR Project (under ref. PA29N.PA0034) and the proposed works under the current ABR2 Project will:

- Redevelop Alexandra Basin West to include new quays and jetties (completed under the parent ABR Project);
- Deepen Alexandra Basin West to achieve standard depths of -10m CD and remediation of contaminated sediments (subject to planning permission for the ABR2 Project); and
- Provide infilling of the basin at Berths 52/53 with treated sediment arising from Alexandra Basin West (subject to planning permission for the ABR2 Project).

In particular, the development works proposed to be completed under the ABR2 Project are necessary for the completion of the Unified Ferry Terminal and new Riverside Berth 52/53, which have been separately authorised as part of the MP2 Project (ref. no. PA29N.304888), and works in respect of which are ongoing.

The ABR2 Project will comprise the completion of redevelopment works in two areas of Dublin Port:

- Alexandra Basin West; and
- Berths 52/53.

Descriptions of the existing land use and proposed development activities at Alexandra Basin West and Berths 52/53 are provided below. The existing land use in adjacent areas and the locations of surrounding designated sites are also described.

5.2.2.1 Alexandra Basin West

5.2.2.1.1 Existing Land Use

The existing land use (adjacent to the area of development of the seabed) within Alexandra Basin West is solely port-related with a number of operational berths, **Chapter 2 Figure 2-5** indicates the infrastructure development of the Port.

Cross Berth Quay: Berths 26-27

A newly constructed 273m long cross berth quay has been completed as part of the ABR Project. Nine separate ‘dolphins’, which allow berthing, are located adjacent to either side of the structure.

Berths 28-31

Berths 28 to 31 within Alexandra Basin West are multi-purpose berths catering for bulk cargo, Lift-on Lift-off off (Lo-Lo) containers; Roll-on Roll-off (Ro-Ro) containers. Several buildings set back from the quay are used for bulk storage.

Berths 32-34

Berths 32 to 34 on the west side of Ocean Pier and within Alexandra Basin West are multipurpose and are used for the importation and exportation of a wide variety of cargo including: Ro-Ro and Lo-Lo operations, trailers and cars, bulk cargo, and break-bulk cargo. Mobile cranes are used for cargo handling on these quays.

North Wall Quay Extension

The North Wall Quay Extension forms the outer part of Alexander Basin West, separating the basin from the River Liffey and forms the greater part of Terminal 3. Ro-Ro vessels use Ro-Ro ramp No. 6 located on the south side of the North Wall Quay Extension, with cruise vessels also catered for on the south side of North Wall Quay. Ro-Ro ramp No. 6 is a single level linkspan and provides a river berth for Ro-Ro vessels. A lighthouse, fabricated from steel, is located at end of the North Wall Quay Extension and is often used as a point of reference for vessels entering port.

Graving Docks

There are two Graving Docks immediately to the north of Alexandra Basin West. Graving Dock No. 1, which is the older of the two docks dating from 1860, was filled in by DPC in 2008 (planning reference 6906/06). Graving Dock No. 2 was designed and built in the 1950's. Graving Dock No. 2 was infilled using treated dredge material from Phase 1 of dredging at Alexandra Basin West under the parent ABR Project. The excavation and restoration of Graving Dock No. 1 was proposed under the parent ABR Project, however it is no longer proposed under the ABR2 Project, application due to the need to retain hard standing areas close to the berth due to pressures on DPC from stakeholders/tenants to facilitate the growth in volume of containers and dry goods between Ireland, the UK and mainland Europe. Graving Dock No. 1 remains preserved and protected and may be excavated at a later stage, pursuant to required consent, if and when sought and granted. However, permission to excavate and restore Graving Dock No. 1 is not sought on the application for permission in respect of the ABR2 Project.

5.2.2.1.2 Proposed Development

Capital dredging will be undertaken to achieve a standard depth of -10m CD at Alexandra Basin West to enable Alexandra Basin West to handle deeper draught ships. In addition, undertaking the works in Alexandra Basin West will allow a legacy contamination issue in the basin to be addressed and remediated, which restricts DPC's ability to carry out routine and essential maintenance dredging operations. The berths in Alexandra Basin West will become increasingly busy in the future, and it is important (including, operationally) that DPC is able to include these berths within routine maintenance dredging campaigns.

Environmental sampling of sediment within Alexandra Basin West (above a depth of -10m CD) has demonstrated that the bed of the basin is contaminated with a range of heavy metals and organotins (Dibutyltin (DBT) and Tributyltin (TBT)) as a result of past ship building, maintenance, and repair activities, handling of

ores, and other shipping activities. The levels of contamination in the existing materials within Alexandra Basin West result in this material being unsuitable for disposal at sea. The extent of contamination has been confirmed following recent site investigation surveys of the less contaminated sediments at the entrance of Alexandra Basin West, with the analysis demonstrating that no material required to be dredged and removed from Alexandra Basin West may be disposed of at sea (above a depth of -10m CD).

5.2.2.2 Berths 52/53

5.2.2.2.1 Existing Land Use

The existing land-use at Berths 52/53, also known as Terminal 5, is solely port-related. Berths 52/53 are located in a basin at the eastern end of the Port, on the northern side of the River Liffey. Berth 52 is fitted with a Ro-Ro ramp, (Ramp No. 7), an older floating linkspan, which is 20m wide. There are berthing dolphins to the western side with pneumatic fenders on the seaward face. There is a rock revetment on the western and northern banks of the basin. Ro-Ro Ramp No. 8, associated with Berth 53, has been demolished under the parent ABR Project and relocated to Berth 27. On the eastern edge of the Berth 53 is a vertical quay wall with pneumatic fenders.

5.2.2.2.2 Proposed Development

The second SID project, as set out in the Dublin Port Masterplan 2040, reviewed in 2018, is the MP2 Project, which was granted planning consent in July 2020 (ABP-304888-19). The MP2 Project, as permitted, amended elements of the ABR Project, with respect to the alignment of Riverside Berth 52, to allow for the insertion and alignment of a new Riverside Berth 53. The new Riverside Berth 53 is currently under construction, and once the new Riverside Berths 53 and 52 have been constructed, the basin will be closed off from the main navigational channel, and the operational basin berths can be decommissioned. Works can then commence to infill the basin, as proposed under the ABR2 Project, which will facilitate the construction of the Unified Ferry Terminal, consented under the MP2 Project. The area around Berth 49 (subject to extension works under the MP2 Project) and Riverside Berth 52 (as consented under the MP2 Project) will be used for possible receipt of remediated dredged material and to facilitate working areas for the ABR2 Project.

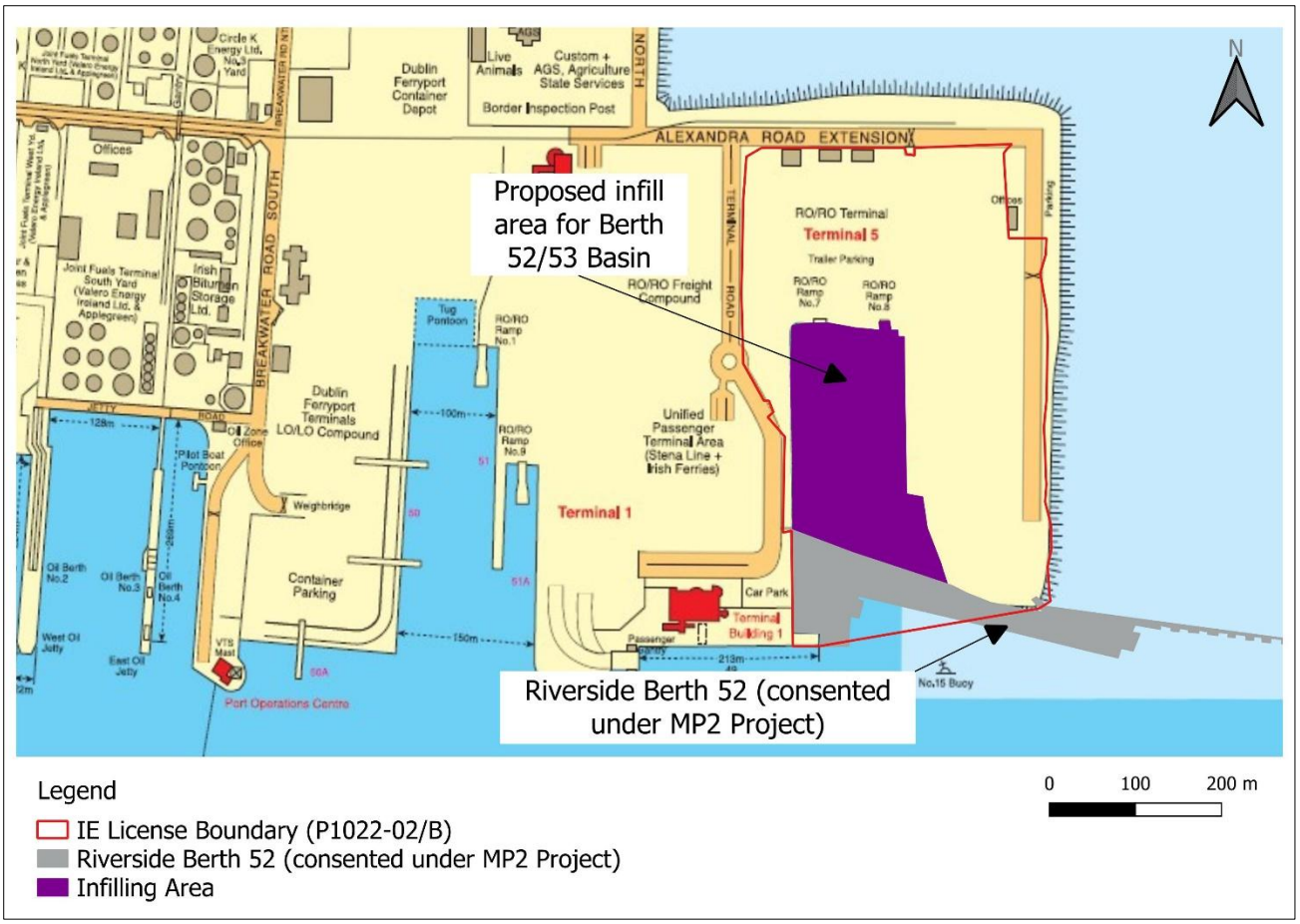


Figure 5-2: ABR2 Project Interface with the MP2 Project

An Industrial Emissions (IE) licence was issued by the EPA (Licence Register No: P1022-02/B) for the ex-situ treatment by stabilisation/solidification (S/S) and recovery of contaminated dredge material at specific locations within Dublin Port as part of the ABR Project (now to be completed under the ABR2 Project). The waste to be treated under this IE licence comprises contaminated dredged sediment taken from Alexandra Basin West. The area of the infilled existing basin of Berth 52/53, the landside area to the immediate east, between this infilled basin and Terminal Road South, and the landside area to the west of this infilled basin, will have the existing levels raised by 1.4m over an area of 95,000m^2, using a combination of clean imported materials and, where suitable, treated remediated material from dredged sediments originating from Alexandra Basin West

The proposed development areas and IE licence boundary are illustrated in **Figure 5-3.**

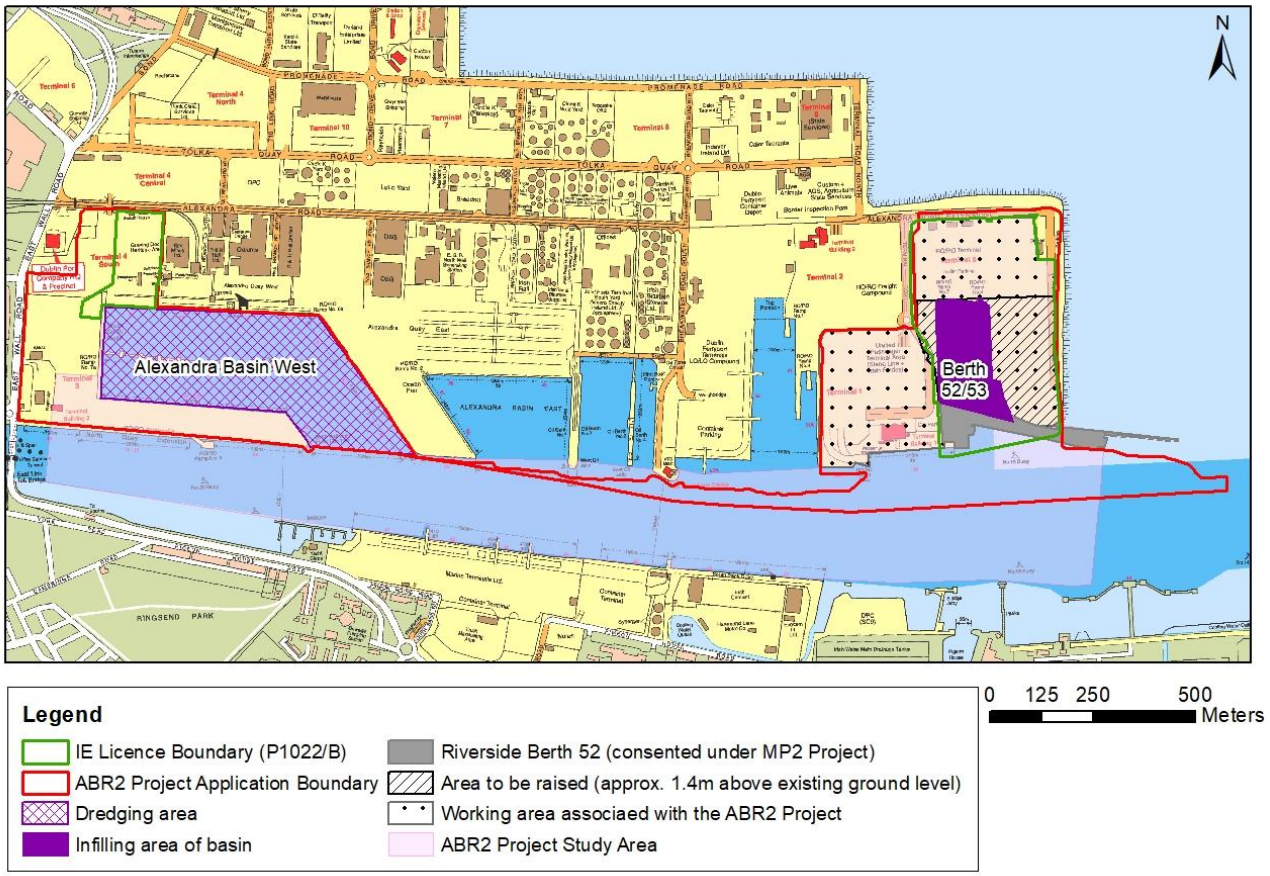


Figure 5-3: Proposed Development Areas

A General Arrangement Drawing illustrating the main elements of the ABR2 Project is presented in **Figure 5-4**, this also indicates the proposed redline boundary of the ABR2 Project for the planning application. It should be noted that the red line application boundary and the study area boundary of the ABR2 Project encompass slightly different areas, with the study area boundary reflecting the movement of barges of dredged/treated sediment material along the navigation channel.

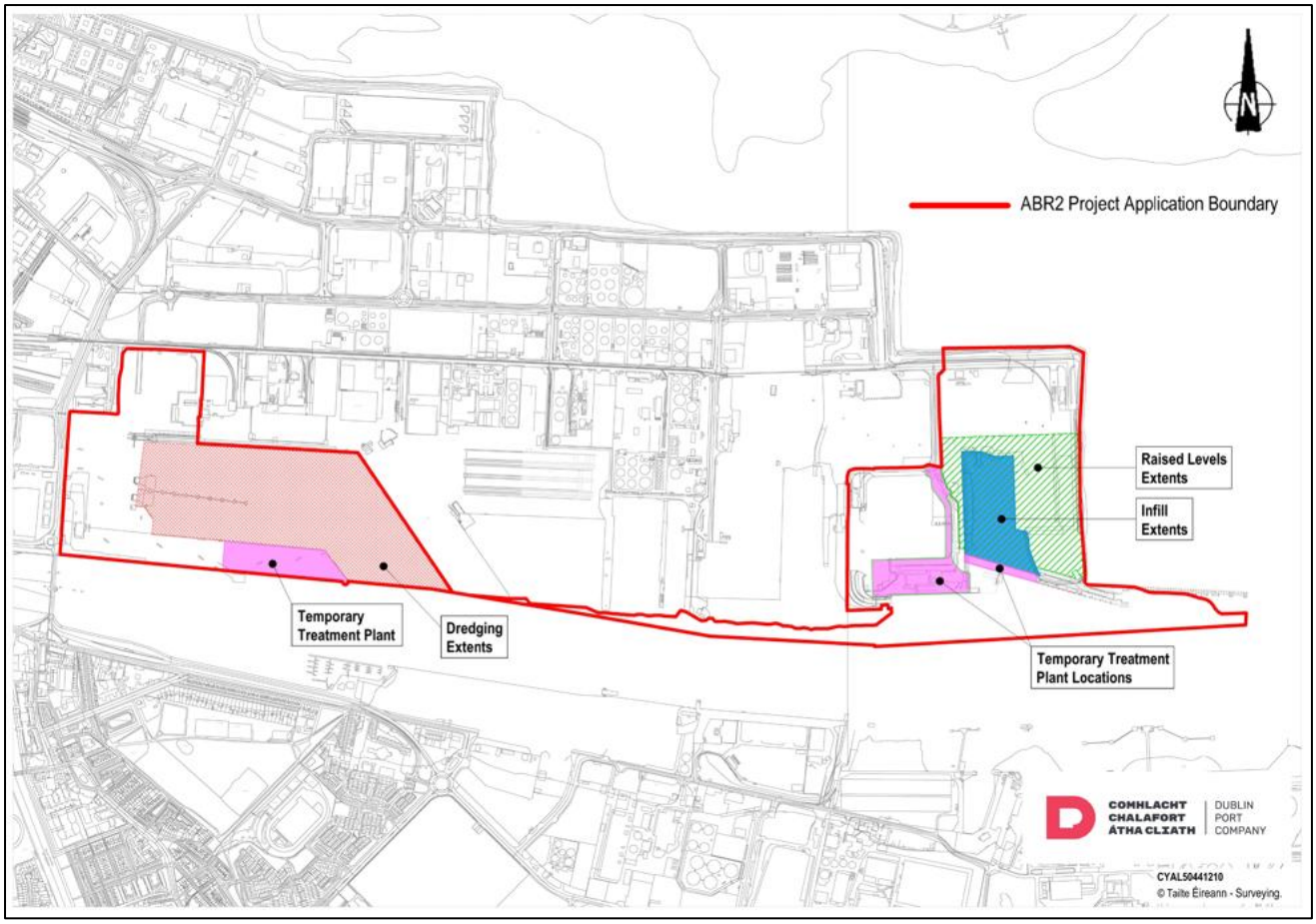


Figure 5-4: General Arrangement Drawing of the ABR2 Project and proposed red line boundary of the planning application

5.3 Consented Enabling Activities

A phased series of interdependent construction works have commenced to maintain Port facilities and facilitate the completion of proposed licensed activities as outlined below.

Construction of Replacement Berths 52 and 53

DPC is currently constructing replacement Berth 52 (East) and Berth 53 as permitted by the MP2 Project to allow for the existing basin to be vacated. Construction of these replacement berths commenced in June 2024 and it is expected that these berths will become operational in Q1 2027.

Construction of Berth 52 West

The provision of replacement berths will allow the existing basin to be vacated, with further works to be subsequently undertaken to provide Berth 52 (West) as consented by the MP2 Project. The function of this phase of works is to close the basin to retain treated sediments proposed to be infilled in subsequent phases and facilitate the removal of redundant piers and jetties within the basin. These works are programmed to commence in Q1 2027 and to be completed in Q1 2029.

5.4 ABR2 Project

This Section of the EIAR describes the proposed marine and landside works for which permission is sought on the planning application submitted in respect of the ABR2 Project.

An overview of the works proposed as part of the ABR2 Project is presented below in **Sections 5.5** to **5.6**. Planning Drawings are also supplied to support this EIAR and are submitted with the application for development consent.

The ABR2 Project has two key elements:

1. Alexandra Basin West: Completion of dredging within Alexandra Basin West, with dredging of remaining 334,000m^3 of contaminated material to a depth of -10m CD over an area of 194,000m^2 within the redeveloped Alexandra Basin West and its subsequent remediation.
2. Berth 52/53 Basin: Infilling of the Berth 52/53 (Terminal 5) basin of an area of 45,650m^2 and the raising of existing levels by 1.4m over an area of 95,000m^2 for delivery of the Unified Ferry Terminal under the MP2 Project.

Pursuant to subsection 4(1) of the Waste Management Act 1996, as amended, ("the 1996 Act"), waste is defined as *"any substance or object… which the holder discards or intends or is required to discard"*. In this respect, the Irish statutory definition fully accords with the definition provided in Article 3(1) of the Waste Framework Directive 2008/98/EC, as amended. Further, as is well-established before the EU and Irish courts, whether a material is a "waste" is dependent on whether the holder of the waste either discards or intends or is required to discard it. It is equally well-established that the concept of "waste" within the meaning of the Waste Framework Directive cannot be interpreted restrictively.

It is worth noting, in general terms, the fact that the waste has to serve a useful purpose "as a principal result" of any recovery operation is an important aspect of distinguishing recovery from disposal operations.

The principal objective of sustainable resource and waste management is to use material resources more efficiently, where the value of products, materials and resources are maintained in the economy for as long as possible and the generation of waste is minimised. In the case of contaminated dredge material originating from Alexandra Basin West, the sediment (following treatment) was identified as being suitable for use to infill Graving Dock No. 2 and for the infilling of the existing basin at Berth 52/53 to provide increased capacity for Ro-Ro traffic in line with the Masterplan 2040 for the development of the Port. The use of treated dredge material replaces the need to use virgin materials that would otherwise be required for the development.

Treatment of contaminant material can occur in several ways. One such method is stabilisation/solidification (S/S) as a remediation technology that reduces the mobility of contaminants. Immobilisation is achieved by reaction of contaminants with reagents to promote sorption, precipitation, or incorporation into crystal lattices, and/or by physically encapsulating the contaminants. The method produces a high-strength monolith-like product that physically reduces the mobility and chemically binds contaminants to the produced matrix. The treated mass can then be recovered/recycled to serve as infill material or for other beneficial use.

In the case of sediments originating from Alexandra Basin West, studies have demonstrated that paste stabilisation treatment appropriately stabilised contaminant movement from the treated sediments. Paste

stabilisation can be conceptualised as an ex-situ form of mass stabilisation, whereby mix designs are predicated on achieving water contents 3-5% above the liquid limit to enable self-weight compaction. Paste stabilisation is a method of treating dredged sediment after it has been removed from the water. The sediment is mixed with stabilising materials (such as cement, lime, or other binders) to create a thick paste. The mixture is designed to contain just enough water—slightly more than the amount at which the sediment starts behaving like a liquid—so that it settles and compacts under its own weight without needing heavy mechanical compaction equipment.

The stabilisation mix design additives utilised to date at Dublin Port are Cement (CEM1 52.5N) and Powder Activated Carbon (PAC) appropriate to the levels of contamination within the sediment. CEM1 is a cementitious binder, PAC acts as an organo-sorbent compound utilised predominantly to retain TBT within the stabilised mass. A test work programme was developed to assess optimal CEM1 binder and PAC application rates with respect to water content and TBT source term mass respectively. In Phase 1 of the ABR Project, undertaken between 2019 and 2021, a threshold of 425µg/kg was set to determine whether PAC was required to be included in the additives for treatment purposes.

Phase 1 of dredging in the ABR Project targeted the removal of the most heavily contaminated sediments to a depth of approximately -8.0m CD. Treatment was undertaken using S/S with the recovered sediments utilised for infilling of Graving Dock No. 2 and the remaining treated sediments stored within the bunded structure. Given the range of contamination in the remaining sediments to be dredged, other design additives, such as Ground Granulated Blast furnace Slag (GGBS), may present a suitable alternative cementitious binder as a full or partial replacement of CEM1 in future works to treat less heavily contaminated dredge sediments. Recovery and use of dredged sediments treated by S/S is largely dependent on the monolith structure being retained to ensure contaminants remain immobilised and bound within the monolith. It is noted however that the potential for future uncontrolled disturbance of the placed and recovered monolith, for example through excavation and installation of services within the S/S sediments, could alter the internal structure of these treated sediments with associated potential unintended mobilisation of contaminants.

However, it is now considered that the use of sediments recovered by S/S is not guaranteed to be appropriately managed in all envisaged use scenarios for the ABR2 Project. It is, therefore, now proposed to utilise sediments recovered by S/S only within the existing unfilled basin of Berth 52/53 with an impermeable barrier layer and minimum 1.4m cover to avoid any future disturbance.

The raising of ground levels elsewhere, as presented in the previous planning application, is proposed to be undertaken using sediments recovered through alternative physico-chemical treatment techniques (for example soil washing) where the efficacy of the treatment is unaffected by any future potential disturbance. Analysis of samples of the sediments yet to be dredged from Alexandra Basin West shows generally lower levels of contamination, and in some zones of the basin, significantly lower levels of contamination. It is expected that the application rates of stabilisation mix design additives to dredge arisings may be lower than used in previous works phases, and for some sediment, it is likely to be demonstrable as sufficiently uncontaminated to require minimal treatment, other than screening and/or washing, to recover sediments for infilling.

The total volume of sediments which are yet to be dredged from Alexandra Basin West which may be successfully recovered (i.e. for which a suitable beneficial use can be identified, fulfils technical quality requirements, and the use of the material does not result in potential negative environmental or human health

effects) is expected to be lower than had been envisaged in the parent ABR Project, as some material (treated by S/S) cannot be utilised as previously identified.

Continued use of Alexandra Basin West for port-related activities and natural processes operating within the River Liffey and Dublin Bay, have resulted in the movement of, and continued deposition of, sediment within the basin since the first phase of dredging operations was completed. Further geochemical analysis of cores of sediment previously sampled from Alexandra Basin West has also been undertaken. A review of all available test data has identified varying degrees of contamination within the sediments which were not removed from the basin during Phase 1 of dredging. All metal contaminants, TBT and DBT, were concentrated in the western side of the basin (to varying degrees). Identified concentrations of TBT are lower than those present before the previous dredging operations occurred of the parent ABR Project, as expected as dredging in Phase 1 was designed to focus on the removal of the most heavily contaminated sediments for treatment.

The removal of sediments affected by the above contaminants must be considered within dredging approaches to ensure that the material is managed to facilitate segregation at source or treated and infilled in controlled zones. Notwithstanding this, sediments with notably lower levels of contamination are present within Alexandra Basin West, which may be suitable for reduced levels of treatment to facilitate recovery for re-use. Studies are scheduled to determine the forms of alternative treatment which may be required for these sediments, with site investigations completed in Q2 2026 to recover samples for analysis and assessment. The results of these investigations will be available and analysed prior to treatment to confirm the volumes suitable for more limited treatment, such as sediment washing and screening/grading. However, a precautionary approach has been taken within this assessment whereby the highest levels of contamination have been used in the calculation of volumes for treatment.

5.5 Project Design

An assessment has been undertaken regarding the expected sources of sediment (i) to be generated from the proposed Phase 2 of dredging within Alexandra Basin West in the ABR2 Project and (ii) from the volume of sediment dredged and treated during Phase 1 of the ABR Project (i.e., 84,300m^3), which is presently stored within the bunded structure, in respect of the capacity at the Berth 52/53 basin for infilling. A design for the usage of the treated sediment has been proposed based upon the available capacity of the Berth 52/53 basin for infilling.

5.5.1 Consideration for Options for the Management of Materials

Volumes of existing treated sediment stored onsite within the bunded structure amount to 84,300m^3 and it is estimated that during Phase 2 of dredging, that dredge arisings to be managed during the ABR2 Project amounts to 333,546m^3 (in-situ volumes).

Volumetric changes are expected to arise on the treated sediment dredged in Phase 1 from bulking following excavation of the bunded structure, through the introduction of air to the treated sediment, however, it should be noted that, during the infilling process, with re-compaction of this sediment, it is estimated that c.95% of the introduced air will be removed with a negligible impact upon overall volumes. Volumetric changes are expected to arise on the sediment recovered from Alexandra Basin West during Phase 2 of dredging due to the addition

of treatment additives or processing as appropriate. Recovery of sediments through solidification/stabilisation treatment during ABR Phase 1 resulted in increases in volume of dredged sediments following treatment of up to 42%. There is potential for variations in the quantities of the various materials to be used for infilling to arise from the proposed treatment and processing phases as outlined below.

It is expected that the Berth 52/53 basin will have capacity in the region of 459,680m^3 to receive recovered materials, with some surplus materials (up to 60,085m^3) expected to be required to be exported from the site for disposal in the event that bulking and processing of sediments results in increases in volume over and above that which were observed during ABR Phase 1 or settlement of the underlying basin is lower than expected following infilling. Accordingly, all the dredge arisings that are capable of being recovered are likely to be managed at Berth 52/53 basin, with only those dredge arisings that must be disposed of being exported offsite in the event that this is required. However, in the unlikely event that the Berth 52/53 basin does not have sufficient capacity to receive all recovered dredge arisings, then DPC has proposed the general management of any excess treated dredge material to be undertaken in line with the waste management hierarchy as follows (in order of preference):

- Where calculations indicate that the available void space of the Berth 52/53 basin cannot accommodate dredging Alexandra Basin West to a standard depth of -10m CD due to the production of excess material, dredging will be reviewed with a variable dredging depth used instead across Alexandra Basin West to minimise the generation of dredge sediments as far as practicable following qualification of dredging depths with the Harbour Master.
- Further identified excess dredge material which cannot be recovered at the Berth 52/53 basin will be recovered at a soil recovery or soil treatment facility in Ireland, subject to testing of the sediments in line with the selected facility's licence at the time of the works.
- In the very unlikely event that a soil recovery or soil treatment facility is not available in Ireland, the material will be recovered at a soil recovery or soil treatment facility in Europe, subject to the testing of the sediments in line with the selected facility's licence at the time of the works.
- Disposal at a licensed landfill facility in Ireland suitable to accept material which must be disposed.

At this stage, however, there remain several variables which could reduce any excess material requiring to be managed (primarily the degree of settlement which occurs following infilling with the basin at Berth 52/53 and volumetric increases in volumes arising from the addition of treatment compounds to the dredged sediment), but there remains the potential for additional material to be generated which cannot be managed within the confines of the site.

In ordinary course, the excess volume of material to be accommodated onsite may reduce as follows:

- The total volume of identified low-level contaminated silts and clays from dredging in Phase 2 of Alexandra Basin West may not require any treatment by S/S and the identified bulkage arising from such treatment may not be required, reducing the total volume of sediments to be infilled into the Berth 52/53 basin by 11,448m^3.

- Sands abstracted from the low-level contaminated sediment from dredging in Phase 2 of Alexandra Basin West may be proven to be suitable for use as capping material in the wider Berth 52/53 hardstanding areas and this could provide an alternative use onsite without utilising void available within the Berth 52/53 basin by up to 26,235m^3.
- The proportion of gravel and sands from dredging in Phase 2 of Alexandra Basin West may vary, feasibly increasing the volume of sediments which could be utilised as capping material on adjacent lands to the Berth 52/53 basin, albeit by an undetermined quantity and this could provide an alternative use onsite without utilising void available within the Berth 52/53 basin.
- Should treatment and placement of identified high-level contaminated dredge cause bulking of the treated sediments at similar levels to those observed in Phase 1 of the parent ABR Project the volume expected to be infilled in the Berth 52/53 basin could reduce by up to 17,143m^3.
- In the event that settlement and consolidation of sediments underlying the proposed infill increases by 400mm (over and above the assumed 600mm), the available void within the Berth 52/53 basin could increase by 14,926m^3.

It is possible that the volume of material generated through dredging of Alexandra Basin West and accounting for existing treated sediment, stored within the bunded structure, which would be available to infill the Berth 52/53 basin, may be less than the maximum void capacity of the Berth 52/53 basin and that no further actions will be required.

The following management of materials is proposed to be carried out, to the extent required:

- All identified sediments with historic contamination present undergoing treatment via S/S are considered as recovered and retained on-site for the infilling of the Berth 52/53 basin.
- The bunded stockpile of existing treated sediments (84,300m^3) from Phase 1 of the parent ABR Project, will be retained on-site for the infilling of the Berth 52/53 basin.
- All identified gravel extracted from dredged sediments during Phase 2 of dredging in Alexandra Basin West, following soil washing activities, will be retained on-site for reuse within capping layers in lands adjacent to the basin at Berth 52/53.
- Given the probable condition of sands (of low contamination) extracted from dredged sediments during Phase 2 of dredging in Alexandra Basin West, following soil washing activities, this volume of material will be considered for export to a recovery facility in Ireland (26,235m^3). Refer to Section 5.7.6 on import and export of materials.
- Further materials required to be removed from the site should be considered to consist of the remaining fractions of the dredged sediments from Phase 2 of dredging in Alexandra Basin West (i.e. in the region of 33,850m^3 of silts and clays), to be removed to a suitable soil recovery or soil treatment facility in Ireland, subject to testing of the sediments in line with the selected facility's licence at the time of the works. In the event that not all fractions of the dredged sediments from Phase 2 of dredging in Alexandra Basin West are capable of being recovered at a licensed facility in Ireland, the material

will instead be recovered at a soil recovery or soil treatment facility in Europe, subject to testing of the sediments in line with the selected facility's licence at the time of the works. Refer to Section 5.7.6 on import and export of materials.

The envisaged management techniques, an indication of the sources and destination of primary materials, and processing expected to be required in the event that offsite recovery of fractions of the dredged sediments from Phase 2 of dredging in Alexandra Basin West is required, are detailed in following sections and summarised in **Figure 5-5**.

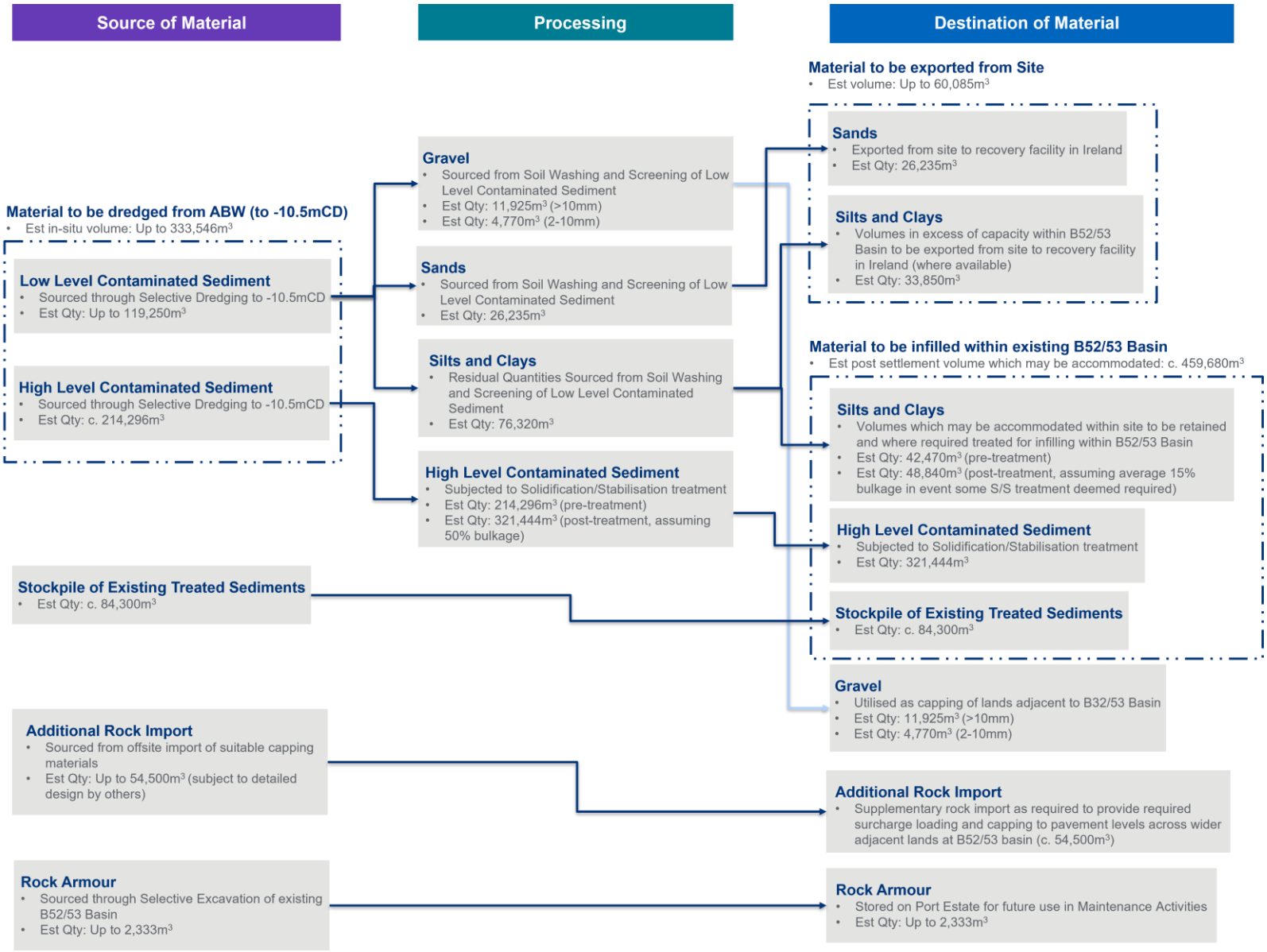


Figure 5-5: Schematic indicating the Material Management Routes from source, processing and destination for the ABR2 Project.

5.6 Construction Phases

The construction phases will involve the following:

- Closure of the existing basin at Berth 52/53 through the construction of the new Riverside Berth 52 and Berth 49 extension works (approved under Planning Ref ABP-304888-19 of the MP2 Project) to contain sediments arising from infilling activities.
- Demolition works proposed at the basin of Berth 52/53 involving the removal of existing marine infrastructure, prior to infilling, which includes the open pile jetty at Berth 52 (c. area of 500m^2) and Ro-Ro Ramp No. 7 to be decommissioned.
- Partial dewatering of the Berth 52/53 basin to facilitate infilling activities.
- Construction of temporary processing and treatment facility/facilities located at the North Wall Quay Extension, Berth 49 or Berth 52 West.
- Provision of temporary materials handling infrastructure (including pumping equipment and dewatering infrastructure) within vicinity of Berth 52/53 basin for infilling activities and at treatment works located at the North Wall Quay Extension, Berth 49 or Berth 52 West.
- Installation of a temporary wastewater treatment plant(s) for the duration of the treatment works which will be located at North Wall Quay Extension, Berth 49 or Berth 52 West as outlined in Section 5.6.8.3 and Drawings IBR1345/015C, IBR1345/016C and IBR1345/018B.
- Completion of capital dredging through Phase 2 of dredging Alexandra Basin West undertaken to a standard depth of -10m CD to recover sediments for treatment on the basis of bathymetric survey data completed in 2025.
- Receipt of dredged sediment by barge delivered from Alexandra Basin West at the North Wall Quay Extension, Berth 49 or Berth 52 West for:
  - Screening to remove oversized particles.
  - Progressive treatment and infilling within the Berth 52/53 basin.
  - Landside dewatering, potentially washing, and storage of sediments with sufficiently low levels of contamination to make them fit for reuse onsite.
- Treatment of:
  - Contaminated impounded water within the Berth 52/53 basin as infilling progresses.
  - Contaminated effluent from the waste treatment process and immediate material handling.
- Use of existing bunded stockpile containing treated dredge material as infill within the Berth 52/53 basin and infilling using treated dredge material from Phase 2.
- Installation of surcharge to infilled and treated sediments to achieve consolidation of the underlying sediments and minimise post-completion settlement and to provide sub-base in all areas to be repaved to provide the Unified Ferry Terminal.

- Raising of levels of the infilled existing Berth 52/53 basin, and the existing levels of the landside area to the immediate east, between this infilled basin and Terminal Road South, and the landside area to the west of this infilled basin, by 1.4m over an area of 95,000m^2.
- Potential temporary storage of treated dredge material landside of the North Wall Quay Extension, Berth 49, Berth 52 West or within the vicinity of the Berth 52/53 basin.
- Provision of ancillary support services and accommodation.
- Final Surfacing (approved under Planning Ref ABP-304888-19 of the MP2 Project).
- Provision of Environmental Monitoring, Critical Quality Attribute (CQA) Monitoring, and Construction Environmental Monitoring Plan (CEMP)-related environmental protection measures.
- Removal of marine infrastructure before infilling of the Berth 52/53 basin. No piles will be removed during demolition. Given that the basin will be infilled, the structures will be cut at the seabed and left in situ prior to infilling. The upper structures mainly comprise concrete/reinforced concrete which will be recycled. Approximately 100 tonnes of mixed construction material associated with the demolition works will be recycled via Material Recovery Facilities (MRF) or landfill.
- Demolition waste will be collected on-site for disposal by a licensed waste contractor. An Asbestos Management Survey was undertaken on the structures at Berths 52 and 53 to be demolished as part of the scheme. No suspected asbestos-containing materials were identified in the marine structures. Limited access was available to the underside of these structures, therefore, they will be subjected to a detailed asbestos survey before demolition.

Further information on the above construction phases is detailed below.

5.6.1 Dredging at Alexandra Basin West

Under the ABR Project permission, dredging of 470,000m^3 of contaminated material to a standard depth of -10m CD was permitted over an area of 194,000m^2 within the Alexandra Basin West. During the period of that grant of permission, an initial phase of dredging resulted in the removal of approximately 97,000m^3 of material. The material dredged was taken ashore, treated and used to infill Graving Dock No. 2. A portion of the treated material (84,300m^3) was stockpiled adjacent to the Berth 52/53 basin in accordance with the conditions associated with the temporary storage of waste on site under the IE licence granted by the EPA. As noted in **Chapter 2 Section 2.2.1**, due to delays, DPC was unable to complete the entirety of the permitted dredging during the period of the grant of planning permission.

It should be noted, that due to the omission of the reconfiguration of the North Wall Quay Extension, as noted in **Chapter 2 Section 2.2.2**, dredging in the immediate vicinity of the North Wall Quay Extension will no longer be implemented to ensure that the existing quay wall is not undermined. This will reduce the volume of material to be dredged below that originally envisaged under the parent ABR Project permission (470,000m^3) by approximately 39,000m^3. Dredging of the remainder of the basin to a

standard depth of -10m CD will generate approximately 334,000m^3 of sediment, with the subsequent treatment of the material for use as infill for the Berth 52/53 basin.

As outlined previously, bed conditions in Alexandra Basin West are comprised of sandy, silty, clays, and extensive sampling and environmental testing has shown that this material is contaminated with metals such as Arsenic, Copper, Chromium, Cadmium, Nickel, Lead, Mercury and Zinc. Elevated levels of TBT and DBT have also been recorded. Consultations with the Marine Institute have indicated that the contaminated material within Alexandra Basin West is not suitable for disposal at sea. Therefore, DPC proposes that this material be treated and re-used for reclamation within the Port as far as practicable, specifically as infill for Berth 52/53.

The methodology for dredging will be the same as that undertaken for Phase 1, which will comprise the use of a floating pontoon with an excavator mounted environmental bucket adapted for environmental dredging. The purpose of this is to minimise the disturbance and escape of material at the seabed and during removal through the water column. A silt curtain is utilised around the dredger whilst the dredging of contaminated material is ongoing. In addition to the mitigation measures proposed within the parent ABR Project Environmental Impact Statement (EIS) from 2014, the use of a contingency bubble curtain (stored on-site) which could be installed across the entrance to Alexandra Basin West was included in the CEMP, following submission. The bubble curtain is to be utilised in the unlikely event of a breach of the silt curtain around the dredger. Dredge plume assessments have demonstrated that dredging may be undertaken at a rate of up to 4,000m^3/day as noted within **Chapter 9 Water Quality and Flood Risk Assessment** and **Chapter 14 Coastal Processes**. It is anticipated however that maximum potential dredging rates will be achieved infrequently due to operational constraints associated with vessel movements within Alexandra Basin West.

Alexandra Basin West may be dredged on an area basis as indicated below in **Figure 5-6** with four potential areas identified within the basin**.** Areas 1 and 4 may be dredged on a 24/7 basis, however, due to the potential for propagation of noise across the River Liffey, Areas 2 and 3 can only be dredged between the hours of 07:00 and 23:00. A maximum of two dredgers may operate within Alexandra Basin West at the same time, with only one dredger per dredge area.

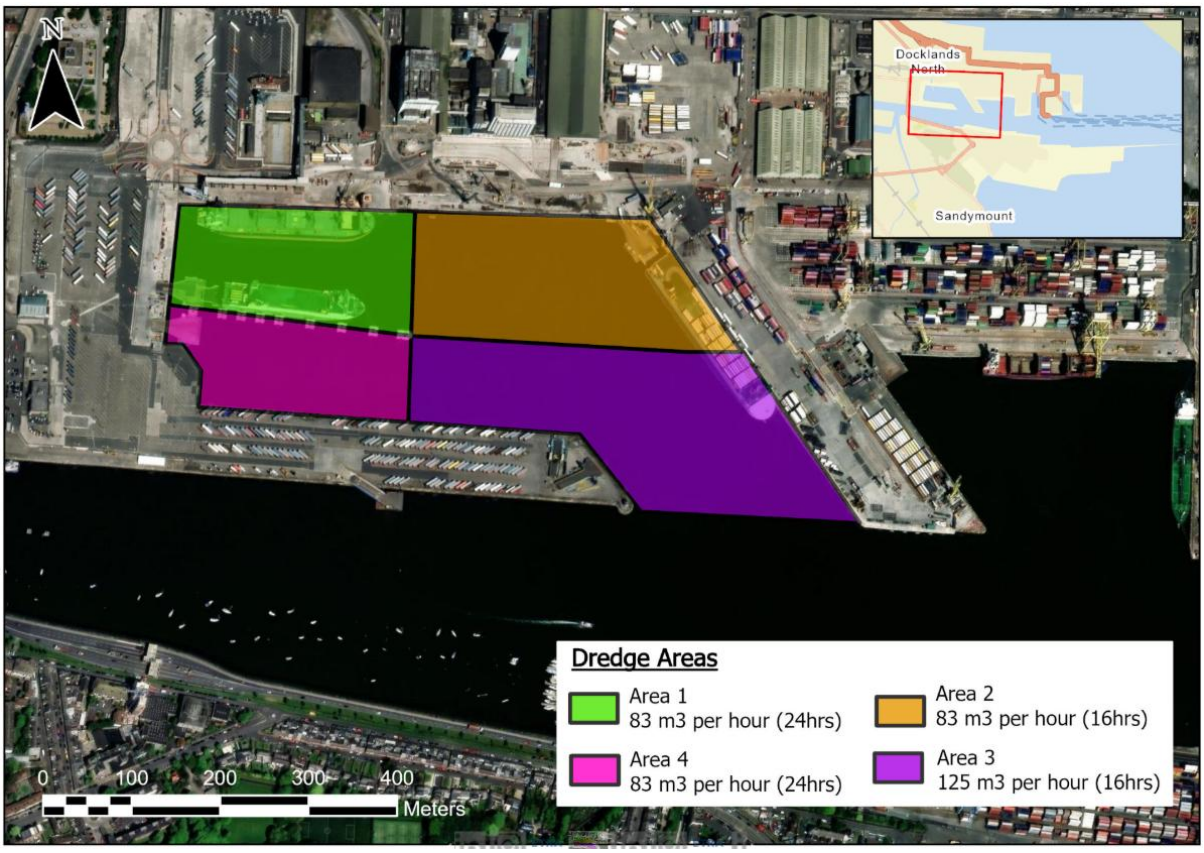


Figure 5-6: Alexandra Basin West proposed dredging areas

Dredged material will be transported to one of the proposed treatment facilities (located at North Wall Quay Extension, Berth 49 or Berth 52 West) by barge. No overtopping of barges will be permitted, and spill plates will be utilised to prevent spillage during offloading operations. To minimise the stockpiling of dredged material, the rate of dredging is determined by the rate of treatment of the dredged material and available stockpile capacity. The contaminated dredged material may be off-loaded on arrival or, alternatively, may be left on the barge overnight to allow for settlement (to remove as much free water from the dredged material as possible). Liquid arising from the solid material settling will be pumped out to an appropriately licensed mobile water treatment plant on-site (under the terms of the existing IE licence). The dredged material will be off-loaded by excavators to the respective treatment facility. Mechanically dredged sediments typically have a solid content comparable to that of in situ sediments.

The contaminated dredged material will be screened to remove extraneous material unsuitable for treatment (e.g. debris). This can be undertaken on the barge itself by raking or by feeding the material onto a screen. This limited volume of material will be disposed of at an appropriately licensed landfill site.

Separation techniques may be applied, should the material be suitable for this technique, to separate dredge material into fines, sand and gravel and to separate contaminated fine particles from uncontaminated sediments. Uncontaminated sediment may be used as fill material without the requirement for further treatment.

The need for dewatering will be determined by the water requirements of the treatment technology and the solids content of the sediments following removal, transport, and screening and separation pre-treatment. The separated sand typically has a solid content around 80 – 85% leaving the process. For dredge material exhibiting greater levels of contamination, further treatment will take place as described in **Section 5.6.2**.

5.6.2 Treatment of Contaminated Dredge Materials from Alexandra Basin West

Consultations with the Marine Institute have indicated that material proposed to be dredged within Alexandra Basin West is not suitable for disposal at sea. Best practice industry techniques (utilising Best Available Technology (BAT)) will be used to treat the contaminated material arising from the dredging of Alexandra Basin West. Dredged material will be treated by means of soil washing and S/S and subsequently infilled into the basin at Berths 52/53.

It is proposed that selected sources of sediments arising from Alexandra Basin West will be subjected to soil washing techniques as appropriate to the source concentrations of contaminants. The treatment of sediment washing, by the intensive washing of the soil to be treated, removes the pollutants, transferring them to the finest particles (silts and clays), from the solid phase to the liquid phase and allows the recovery of the inert fraction with coarser particle size (sands and gravels) for reuse on site. It is expected that this form of treatment will be applied to c.120,000m^3 of dredge sediment arising from Alexandra Basin West.

Sediments which are deemed too contaminated for solely soil-washing techniques will be subject to the process of S/S treatment as outlined in **Section 5.4**. The treatment and recovery of dredged material on-site must take place in accordance with the conditions of the IE licence, or any subsequent amendments to the licence which may be required to accommodate the works as outlined in this Project Description. The following waste-related processes are:

- Storage of waste, including imported waste to be used in the waste treatment process;
- Treatment of waste (contaminated dredge material);
- Recovery of treated waste by infill within the installation; and
- Treatment of contaminated process water.

The maximum tonnage of material for recovery as per Schedule A.2 of the IE licence is 1,262,800 tonnes. This is based on 574,000m^3 of infill after S/S has occurred (470,000m^3 of dredge spoil). During Phase 1 dredging under the parent ABR Project, the previous S/S process undertaken for dredged sediments required 38.3m^3 of water per 1,000m^3 of dredged material treated. It is proposed that treatment of sediments in Phase 2 will not exceed peak daily dredge rates generating material for treatment, and it is estimated that on average 95.8m^3 of water will be required for treatment per day.

To promote the re-use of resources where possible, the treatment process of dredged material will be undertaken using industrial wastewater effluent, which is to be sourced from the proposed on-site wastewater treatment plant to be installed to manage wastewater arising from the dredge treatment operations. Mains water supply within the Port cannot facilitate treatment works at Berth 49 or Berth 52 West due to the volume of water required during the treatment of the dredged sediment, therefore, the use of industrial wastewater effluent is proposed to be supplemented from the water displaced from the proposed infilling area of the Berth 52/53 basin. This avoids the need for connection to the mains network and proposes the re-use of water which would have been otherwise discharged into the River Liffey. Where additional water supplies are required for treatment operations occurring at the North Wall Quay Extension alongside the industrial wastewater effluent, this will be facilitated by connection to existing saltwater supplies which are operated by Dublin Port in the vicinity of the North Wall Quay Extension. This saltwater supply is also used in emergency circumstances for fire-fighting within the Port, should the need arise.

It is envisaged that conventional soil washing and in the case of S/S, conventional mixing techniques, will be utilised. The plant can be scaled according to the volume of material to be treated, which is anticipated not to exceed peak daily dredge rates generating material for treatment. Where daily dredging rates exceed treatment capacity on a given day, surplus sediments generated over and above the installed treatment capacity will be stockpiled locally to the relevant treatment plant for treatment on subsequent days where dredging rates do not exceed treatment capacity. A proposal for Specified Engineering Works will be submitted to the EPA for agreement in accordance with Condition 3.16 of the IE licence and will contain the following:

- Installation of waste handling and processing infrastructure;
- Installation of wastewater treatment plant;
- Relocation of plant and equipment as the phases of the licensable activity progress;
- Capping of infill areas; and
- Any other works notified in writing by the EPA.

No engineering works proposed under the planning application will be undertaken without the prior agreement of the EPA. Under the conditions of the IE Licence all waste handling and processing will be undertaken in designated, bunded areas designed and constructed in accordance with current EPA Guidance. Such areas will be rendered impervious to the materials to be handled and temporarily stored therein, and provided with segregated drainage to facilitate collection of potentially contaminated runoff for treatment and discharge in accordance with the IE licence. Typical processes for the treatment of dredge sediment envisioned to occur for the ABR2 Project are set out below.

5.6.2.1 Separation Process

As required, the contaminated dredged material will be screened to remove extraneous material unsuitable for treatment (e.g. debris). Dredged material will be screened potentially either within the

barge, or in a storage compound, as required, following unloading as part of the pre-treatment process. This material will be disposed of at an appropriately licensed landfill in Ireland.

Separation (soil washing) techniques may be applied, should the material be suitable for this technique, in order to separate dredge material into fines, sand and gravel in order to separate contaminated fine particles from uncontaminated sediments. Uncontaminated sediment may be used as fill material without the requirement for further treatment. The need for dewatering will be determined by the water requirements of the treatment technology and the solids content of the sediments following removal, transport and screening and separation pre-treatment.

5.6.2.2 Dewatering Process

Reducing the moisture content reduces the volume to be treated and the volume of additives that may be required for the S/S process, or to make dredge material which is required to be removed from site fit for transport by HGV or shipping vessels. If deemed necessary to facilitate management and recovery for re-use onsite, further dewatering methods may be applied to the separated fines to return the dredged sediments moisture content as a minimum to that of the in-situ material. Dewatering will reduce the dredged material's moisture content and consolidate it, which facilitates handling, thereby reducing the volume for the subsequent treatment process. Generally, mechanical dewatering technologies can remove free and interstitial water and increase the solids content up to 70% by weight. The dewatering process can be engineered around a large difference in moisture content and varies by material type (fines, sand and gravel) undergoing dewatering.

5.6.2.3 Wastewater Treatment Process

The proposed process for the treatment of wastewater will be designed to achieve the emission limit values of the IE licence.

During the construction phase of works, contaminated water arising from the sediment handling process will require to be managed. A wastewater treatment plant will comprise a single lane treatment process to remove suspended solids, product and contaminants (if present) from the wastewater produced from the dredging, dewatering and treatment processes. The volume of water to be treated will be determined by the amount of water to be removed prior to the treatment process.

Flocculants may be required as part of the dewatering and wastewater treatment processes. Water arising from the dewatering process will be removed by pumping and treated in a water treatment plant before being discharged via the designated discharge point to the River Liffey in accordance with the conditions of required consents.

Sampling points will be included within the pipe work system to allow for the collection of water samples from emission point as per the IE licence. The sampling and testing schedule will be in accordance with Schedule C of the IE licence. The wastewater processing and discharge activities will continue during the night with mitigation in place to reduce the noise generated at source, which is achieved through compliance with Best Practice British Standards Construction Guidelines.

5.6.2.4 Sediment Handling Process

The sediment handling process will be undertaken in a batching plant in the proposed treatment area(s), and as further detailed in **Section 5.6.3**. The soil washing and S/S treatment plants will be brought to the treatment area by road on low-loaders or by sea aboard barges and set up on site. Plant and equipment will be installed on concrete hardstanding areas. It is envisaged that conventional mixing techniques will be utilised in the Project. The plant can be scaled according to the volume to be treated.

5.6.3 Treatment Compounds and Working Areas

Due to the complex operations occurring within Dublin Port, the treatment and recovery operations for the dredged sediment from Alexandra Basin West under the ABR2 Project may take place at either the North Wall Quay Extension, Berth 49 or Berth 52 West. All material transported via barge will incorporate the use of spill plates. There is potential, due to operational activities occurring within the Port, that the various elements associated with the treatment works may occur at one, or two of the three of the proposed locations concurrently. Due to operational constraints within the Port, Berth 49 and Berth 52 West may not be used concurrently. This may result in several handling and treatment scenarios occurring during the construction phase: either one of the possible three locations individually; or a combination of two alternative scenarios (excluding Berth 49 and Berth 52 West occurring concurrently) as outlined in Scenarios A to D below.

5.6.3.1 Scenario A

Under Scenario A, the following sediment handling and treatment process is proposed:

- Dredged sediment from Alexandra Basin West is transported via barge to Berth 49. The material may be stockpiled before undergoing treatment.
- All treatment (including soil washing and S/S) is undertaken at Berth 49 (with associated Wastewater Treatment Works).
- Material treated via S/S will be transported via pumped pipelines located under the access road network to the reception area to be directly infilled within the Berth 52/53 basin, or alternatively by road haulage within the Port Estate.
- Material treated via soil washing may be temporarily stored within a stockpile at Berth 49 before being transported via pumped pipelines located under the access road network to the reception area, or alternatively by road haulage within the Port Estate, to then be used for infilling activities.

5.6.3.2 Scenario B

Under Scenario B, the following sediment handling and treatment process is proposed:

- Dredged sediment from Alexandra Basin West is transported via barge to Berth 52 West. The material may be stockpiled before undergoing treatment.

- All treatment (including soil washing and S/S) is undertaken at Berth 52 West (with associated Wastewater Treatment Works).
- Material treated via S/S will be transported via pumped pipeline to the reception area to be directly infilled within the Berth 52/53 basin.
- Material treated via soil washing may be temporarily stored within a stockpile at Berth 52 West before being transported via pumped pipeline to the reception area to then be used for infilling activities.

5.6.3.3 Scenario C

Under Scenario C, the following sediment handling and treatment process is proposed:

- Dredged sediment from Alexandra Basin West is transported via barge to the North Wall Quay Extension.
- All treatment (including soil washing and S/S) is undertaken at the North Wall Quay Extension (with associated Wastewater Treatment Works).
- Treated sediments are transported via barge to either:
    - Berth 49 for subsequent temporary storage of soil washed materials within a stockpile (before being transported via a pumped pipeline, or alternatively via internal road haulage, to the reception area to then be used for infilling activities), with materials treated via S/S transported via a pumped pipeline, or alternatively via internal road haulage, to the reception area to undergo infilling at the Berth 52/53 basin, or
    - Berth 52 West with transport via a pumped pipeline, or alternatively via internal road haulage, for subsequent temporary storage of soil washed materials within a stockpile (before being used for infilling), with materials treated via S/S transported via pumped pipeline, or alternatively via road haulage, to the reception area to undergo infilling at the Berth 52/53 basin.

5.6.3.4 Scenario D

Under Scenario D, the following sediment handling and treatment process is proposed:

- Dredged sediment from Alexandra Basin West is selectively transported by barge (determined by source contamination levels) to either the North Wall Quay Extension and Berth 49 or to the North Wall Quay Extension and Berth 52 West.
- Soil washing occurs at the North Wall Quay Extension for sediments showing low-levels of contamination (note fine sediments produced from soil washing activities will be subsequently transferred by barge to either Berth 49 or Berth 52 West for S/S treatment).
- All other sediments are transported via barge for S/S treatment to either Berth 49 or Berth 52 West. A Wastewater Treatment Works will be required at both envisaged treatment

compounds, i.e., the North Wall Quay Extension and Berth 49 or the North Wall Quay Extension and Berth 52 West. The material may be stockpiled before undergoing treatment. Should this material be stockpiled at Berth 52 West, this will be transported via pumped pipeline, or alternatively via road haulage, to the stockpiling area before being transported back to the S/S treatment plant located at Berth 52 West to then undergo treatment.

- Once soil washing activities are complete at North Wall Quay, the treated material will be transported via barge to either Berth 49 or Berth 52 West for subsequent temporary storage and/or infilling at the Berth 52/53 basin. In the event that this material proposed for stockpiling at Berth 52 West, this will be transported via pumped pipeline or internal road haulage to the stockpiling area.
- Sediments treated via S/S at either Berth 49 or Berth 52 West will be transferred to the basin of Berth 52/53 for infilling via pumped pipeline, or alternatively via internal road haulage, to the S/S reception area.

At the commencement of construction works, as outlined above, dependent upon operational constraints within Dublin Port, the site compound will be established as required within the scenarios outlined above. It should be noted that, during the treatment of dredged materials and infilling activities of the Berth 52/53 basin, the site compound and associated plant may need to be relocated between and within working areas of the North Wall Quay Extension, Berth 49, and Berth 52 West. Further details on the general areas proposed for these treatment compounds and working areas are given below in **Sections 5.6.3.5** to **5.6.3.7**. Whilst the use of saltwater is proposed for the treatment process of dredged material, the various site welfare facilities and offices required for the treatment compounds, will require the use of potable water, supplied by a temporary and it is expected that approximately 4.5m^3 of potable water will be required per day.

5.6.3.5 The North Wall Quay Extension Treatment Compound and Working Area

Figure 5-7 shows the general location of the treatment compound and working area located at the eastern area of the North Wall Quay Extension. The soil washing and S/S treatment process will occur in batching type plants within the proposed treatment area. The dredged sediment will be removed from the barges at the reception area before going for treatment, as required material may be stockpiled prior to treatment occurring. The site compound will also include site offices, welfare facilities, storage areas, a canteen and a laboratory. At the North Wall Quay Extension, temporary modular buildings will be used to provide accommodation. Vehicular parking will be located adjacent to the accommodation area. Existing lighting is expected to be utilised to provide general illumination of the compound and working areas. Temporary lighting on-site for task-specific working and circulation within the working area will be limited to avoid overspill and light nuisance.

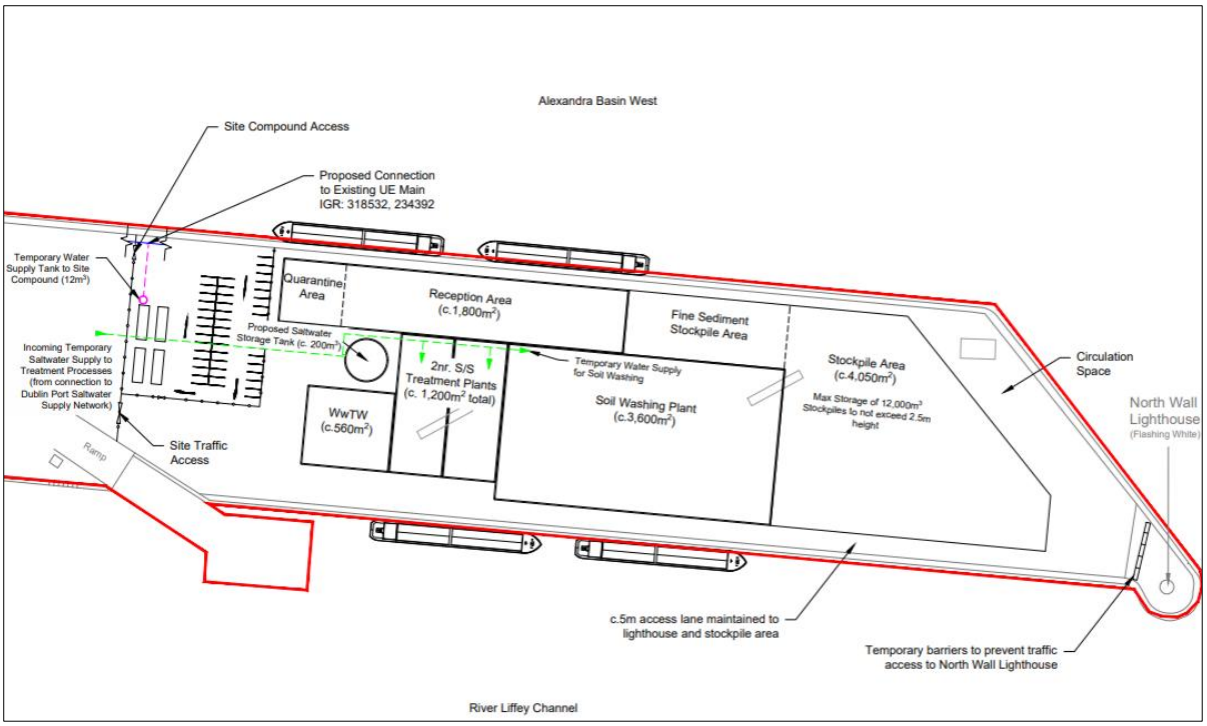


Figure 5-7: Treatment Compound and Working Area Layout at the North Wall Quay Extension

All works associated with the treatment compound and working area at North Wall Quay Extension are temporary in nature and shall be removed on completion. The works will include the following measures:

- All waste handling and processing will be undertaken in designated, bunded areas designed and constructed in accordance with current EPA Guidance. These bunds will be constructed on a separation liner (geotextile) laid over the existing surface to ensure separation and facilitate removal on decommissioning of the waste handling and processing equipment;
- Stockpile heights will be limited, so as not to exceed heights of the material being stored to ensure loading from materials onto the structure of North Wall Quay Extension remain below service loading (expected to be 50kPa);
- Spill plates will be utilised at quayside handling locations to avoid contamination of the surfaces forming the quay edge of the structure, arising from transfer of contaminated sediments from barges to North Wall Quay Extension treatment and handling infrastructure; and
- Temporary barriers will be provided to maintain separation of traffic associated with construction and treatment activities from the lighthouse located on the eastern edge of North Wall Quay Extension.

5.6.3.6 Berth 49 Treatment Compound and Working Area

Figure 5-8 shows the general areas associated with the treatment compound and working area located immediately north of Berth 49, in the vicinity of the existing ferry terminal building at Terminal 1. The soil washing and S/S treatment process will occur in batching type plants within the proposed treatment

area. The dredged sediment will be removed from the barges at the reception area before treatment, as required material may be stockpiled prior to treatment occurring. Depending upon operational constraints, there is potential for the location of the stockpile and the treatment infrastructure to be swapped in location. Furthermore, should soil washing be unable to occur at the North Wall Quay Extension, the area indicated for stockpiling at Berth 49 may host a soil washing plant.

The site compound will also include site offices, welfare facilities, storage areas, a canteen and a laboratory. Vehicular parking will be located adjacent to the accommodation area. Existing lighting is expected to be utilised to provide general illumination of the compound and working areas. Temporary lighting on-site for task-specific working and circulation within the working area will be limited to avoid overspill and light nuisance.

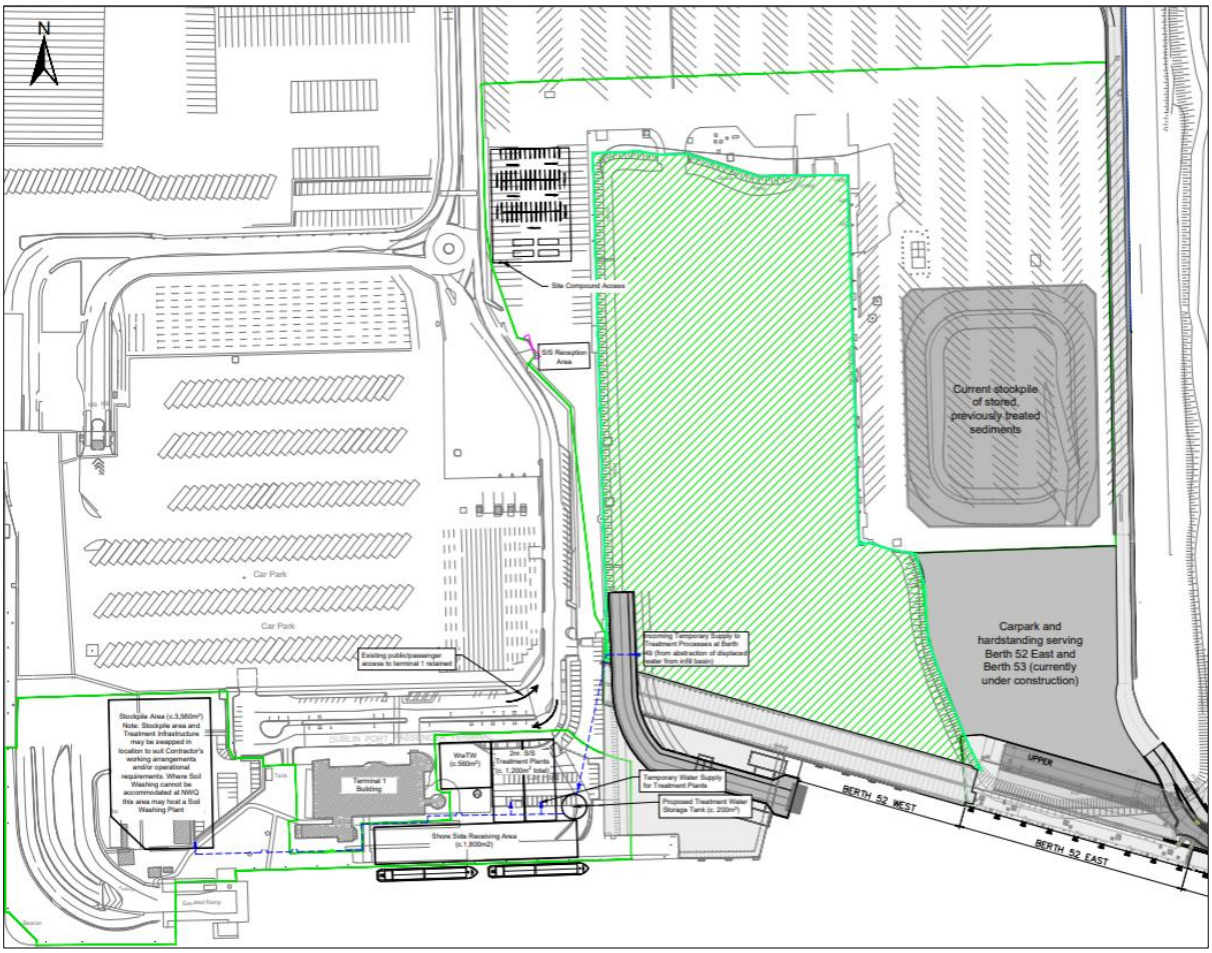


Figure 5-8: Treatment Compound and Working Area Layout at Berth 49

5.6.3.7 Berth 52 West Treatment Compound and Working Area

Figure 5-9 shows the general areas associated with the treatment compound and working area located around the immediate area of the Berth 52/53 basin. The soil washing and S/S treatment process will occur in batching type plants within the proposed treatment area. The dredged sediment will be removed from the barges at the reception area before treatment, as required material may be stockpiled

prior to treatment occurring. Should soil washing be unable to occur at the North Wall Quay Extension, an area is available for soil washing beside the proposed stockpile area.

The site compound will also include site offices, welfare facilities, storage areas, a canteen and a laboratory. At Berth 52 West, temporary modular buildings will be used to provide accommodation. Vehicular parking will be located adjacent to the accommodation area. Existing lighting is expected to be utilised to provide general illumination of the compound and working areas. Temporary lighting on-site for task-specific working and circulation within the working area will be limited to avoid overspill and light nuisance.

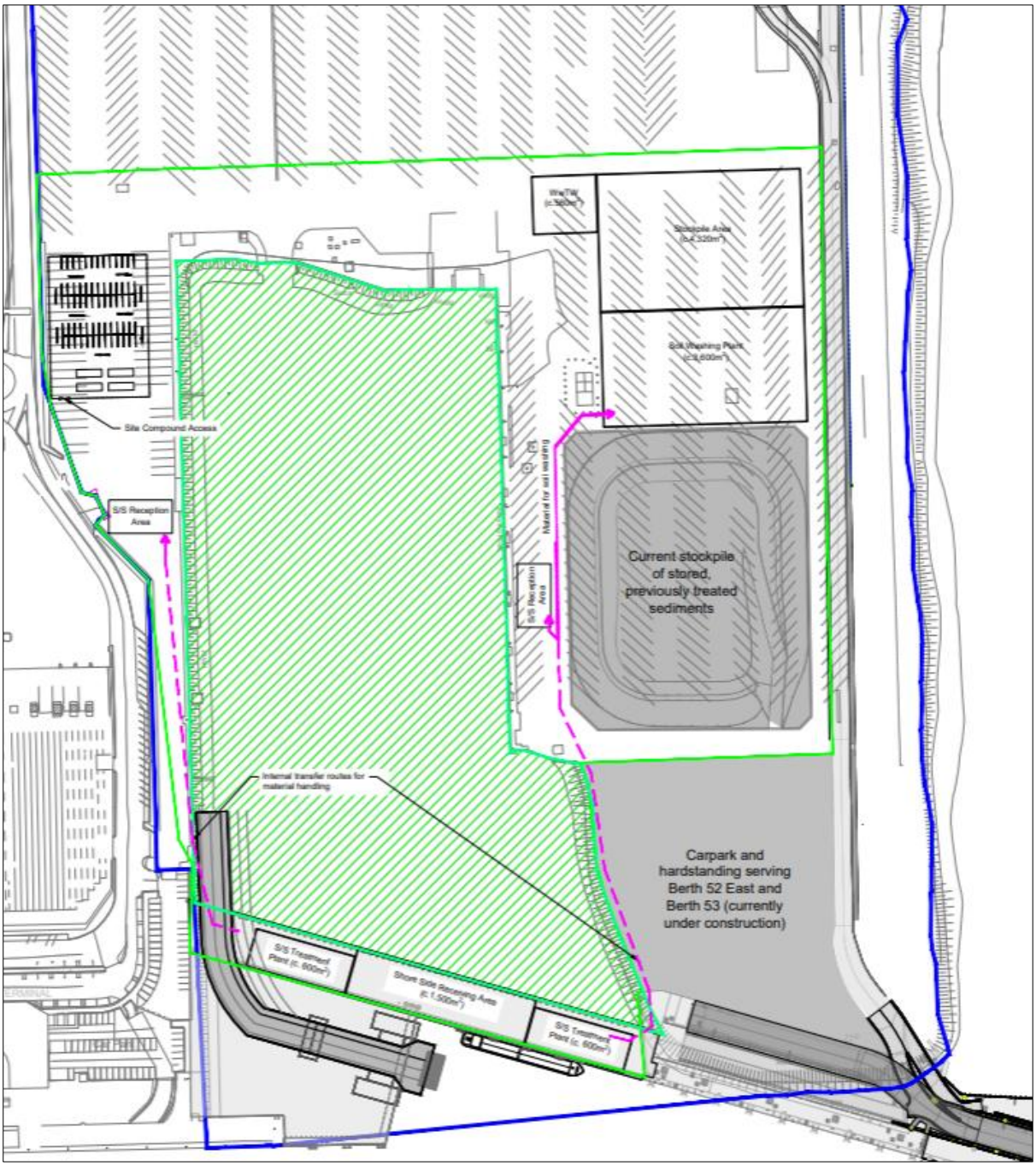


Figure 5-9: Treatment Compound and Working Area Layout at Berth 52 West

5.6.3.8 Material Stockpiling

As noted in **Sections 5.6.3.5** to **5.6.3.7**, there is potential for stockpiling of material to occur in the locations indicated at either the North Wall Quay Extension, Berth 49 or Berth 52 West as shown in **Figure 5-7** to **Figure 5-9**. At the North Wall Quay Extension, the stockpiles will not exceed heights imposing loads onto the structure of North Wall Quay Extension above acceptable service loading and, at Berth 49 and Berth 52 West, will not exceed the height of a stockpile placed at the natural angle of repose of the sediments within the footprints of the storage areas (nominally 4.5m in height).

As required, stockpiling may occur of both dredged sediment and sediment which has been treated by the soil washing process prior to this being used for infilling of the Berth 52/53 basin. If such stockpiling of dredged sediment occurs, it will only be on a short-term basis before the material undergoes S/S treatment for direct infilling within the Berth 52/53 basin. Stockpiling may also occur of coarse material which has been screened from the dredged sediments. Longer-term stockpiling will occur of the materials treated via soil washing as it is intended that this will be used for infilling after sediment treated via S/S has been placed within the Berth 52/53 basin.

5.6.4 Infilling Activities at Berth 52/53 Basin

The construction of Riverside Berth 52 permitted under the MP2 Project will provide closure between the Berth 52/53 basin and the navigation channel, so as to allow the infilling of the basin to occur and the raising of the levels of Terminal 5. The treated dredged material will be recovered for use as infill for the basin at Berth 52/53 as shown in **Figure 5-10**. Infilling will consist of sediments recovered from Phase 2 of dredging and treatment under the ABR2 Project and the treated material recovered during Phase 1 dredging undertaken as part of the ABR Project (c.84,300m^3) which is presently stored within the bunded structure to the east of the Berth 52/53 basin. These materials will be used to infill to the rim of the existing Berth 52/53 (c.3.2m OD). The existing storage bund will be decommissioned following the completion of infilling, this will include the demolition of the perimeter concrete containment walls with the area returned to hardstanding. Further minor infilling will occur within the basin to provide the final surface levels of the infilled material following settlement. This will create a temporary surface with surface gradient of up to 2.5% of which will be capped.

Capping and consolidation will take place as outlined in **Section 5.6.5**, this will facilitate drainage and shedding of incident rainfall and surface water from the infilled area without coming into contact with the infilled material. Briefly, this will involve a 1mm thick HDPE liner layer being used to cap the infill material which will be overlain by a needle punched geotextile layer to provide protection from overlying capping materials. Consolidation will involve surcharge material of imported stone fill of c.2m depth being used and this will remain in place for c.2 years and will be distributed across the infilled Berth 52/53 basin and adjacent land areas to the north-east and west to provide capping in advance of paving works occurring under the permitted MP2 Project.

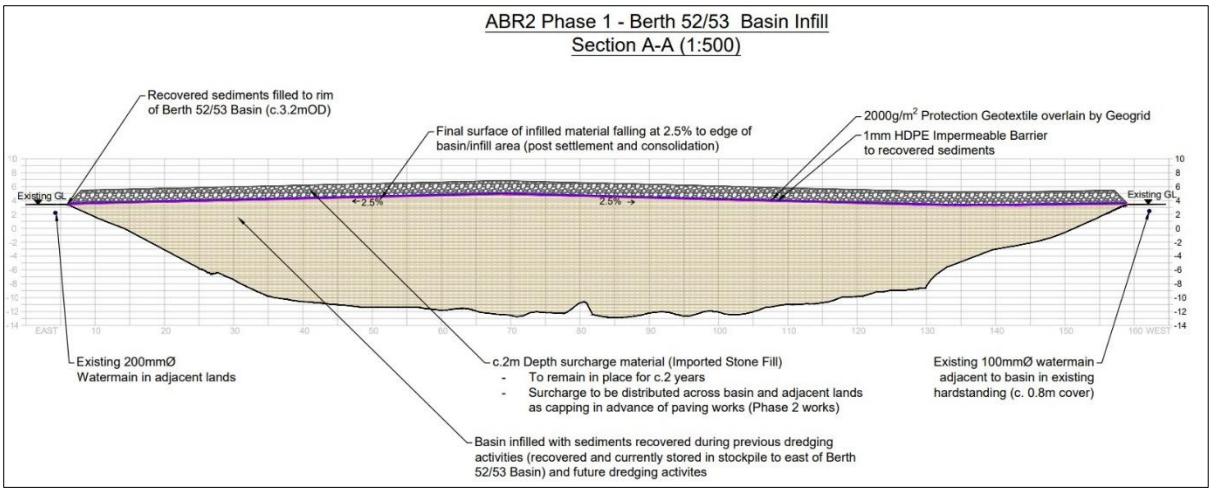


Figure 5-10: Schematic of Infilling Operations at the Berth 52/53 basin

Prior to the filling of the Berth 52/53 basin, the replacement Riverside Berth 52 West quay wall will be constructed to close off the Berth 52/53 basin from the main navigation channel. This will eliminate direct surface water flows from the main estuary into the basin. If required, a controlled outlet at Berth 52/53 will be constructed to control water level and flow. A written record of the types and quantities of material recovered at the infill area will be maintained. Ongoing monitoring of the soil washing and S/S processes will also take place during construction and will consist of the following:

- Environmental testing to measure the leaching of contaminants from the treated material as per the IE licence requirements;
- An ongoing monitoring programme will be undertaken prior to, during, and post the sediment recovery operations as per the IE licence requirements of Schedule C Control and Monitoring; and
- A Quality Assurance/Quality Control (QA/QC) programme will be established.

As outlined in **Sections 5.6.3.1** to **5.6.3.4**, a number of scenarios may be undertaken for the treatment, stockpiling and infilling of material into the Berth 52/53 basin, these are described below:

Scenario A

In the event that material is treated as outlined in Scenario A, then all treatment will take place at Berth 49. The dredged sediment will be transferred via barge to Berth 49 and will be off-loaded via excavators into the reception area before the sediment undergoes S/S treatment, the dredged material may be temporarily stored within a stockpile before being used for direct infilling into the Berth 52/53 basin following S/S treatment with transport via contained conveyance systems or trucks. Sediment which is treated via soil washing may be temporarily stored within a stockpile for a longer period of time before being used for direct infilling into the Berth 52/53 basin following S/S treatment with transport via contained conveyance systems or by trucks within the internal road network of the Port.

Scenario B

In the event that material is treated as outlined in Scenario B, all treatment will take place at Berth 52 West. The dredged sediment will be transferred via barge to Berth 52 West and will be off-loaded via excavators into the reception area before the sediment undergoes S/S treatment, the dredged material may be temporarily stored within a stockpile (noting that transfer between stockpile and treatment areas will be required) before being used for direct infilling into the Berth 52/53 basin with transport via pumping systems or trucks. Sediment which is treated via soil washing may be temporarily stored within a stockpile for a longer period of time before being used for direct infilling into the Berth 52/53 basin following S/S treatment with transport via contained conveyance systems or by trucks within the internal road network of the Port.

Scenario C

In the event that material is treated as outlined in Scenario C, all treatment will take place at the North Wall Quay Extension. The treated material will be transferred via barge to either Berth 49 or Berth 52 West and will be off-loaded (dry dig) using excavators into a reception area. The material which has been treated via soil washing may be temporarily stored within stockpiles using excavators and/or pumping systems before undergoing infilling. Material which has been treated by S/S will go for direct infilling into the Berth 52/53 basin with transport via pumping systems or by trucks within the internal road network of the Port.

Scenario D

In the event that materials are treated as outlined in Scenario D, where a selective treatment process operates at the North Wall Quay Extension for less contaminated sediments with soil washing activities undertaken before subsequent transfer via barge for the washed sediments to either Berth 49 or Berth 52 West, the material will either be temporarily stored within stockpiles using excavators or pumping transfer or go for direct infilling into the Berth 52/53 Basin with transport via contained conveyance systems or trucks.

Under Scenario D, the remaining more-contaminated sediments are transported via barge to either Berth 49 or Berth 52 West. These will be off-loaded via excavators into the reception area. This material may be temporarily stockpiled (noting that transfer between stockpile and treatment areas will be required at Berth 52 West) before the sediment undergoes S/S treatment, with the treated material subsequently transferred to the infill area of the Berth 52/53 basin via pumping systems or by trucks within the internal road network of the Port.

The placement of the treated material is most likely to include the use of a hopper and tremie pipework to direct treated sediment to the base of the basin and minimise washout of treatment additives from the treated sediment.

When infilling into water, process stabilisation will minimise contaminant release from material infill as the stabilised mixture is made before it is deposited into the fill area, with contaminant release reducing as the mixture cures in-situ contaminants as the stabilised mixture is made prior to its deposition into the infill area of the Berth 52/53 basin.

Water quality will be measured during the filling operation to ensure that measured parameters are within agreed limits. A controlled outlet from the Berth 52/53 basin will be constructed to control water level/flow. A written record of the types and quantities of material recovered at the infill sites will be maintained. Ongoing monitoring of the soil washing and S/S process will also take place during construction and will consist of the following:

- Geotechnical tests e.g. permeability (hydraulic conductivity) and the compression strength of the stabilised materials after different strength development periods;
- Environmental testing e.g. batch leaching tests and diffusion testing to measure the leaching of contaminants from the treated dredge material as per the IE licence requirements;
- An ongoing monitoring programme will be undertaken prior to, during, and post the recovery operation (surface water quality in harbour, monitoring of pore water in the construction, sediment samples from the harbour, water levels and groundwater quality) as per the IE licence requirements; and
- A QA/QC programme will be established.

5.6.5 Capping and Consolidation

Following the relocation and compaction of the treated sediment recovered during Phase 1 of the parent ABR Project (currently stored at a bunded stockpile to the east of the Terminal 5 basin), the infill will be capped with a 1mm thick HDPE liner layer that will prevent water ingress into the infilled material. This impermeable isolation capping layer will be overlain by a 2,000g/m^2 needle punched geotextile protection layer to protect the HDPE from damage arising from the installation of the overlying capping materials.

To promote consolidation and settlement of the infill material and underlying soft basin sediments, surcharge materials will be imported (crushed rock and stone) and placed to a depth of c.2m. The consolidation process may be accelerated through the provision of vertical band drains into the underlying sediments to relieve pore water pressures generated from the loading imposed by the infill of recovered sediments. Porewater will be collected from the vertical band drains installed and surface water shed from the impermeable barrier/capping layer will be collected from the perimeter of the capped area for discharge via the Wastewater Treatment Works if required, subject to water quality.

The closure quay at Berth 52 West will be constructed in advance of these proposed works (under the separate planning consent of the MP2 Project) using a causeway constructed from imported rock. Following completion of construction activity for the Berth 52 West quay wall, this rock is proposed to be removed. Subject to the availability of storage during the works within the Port, quantities of that rock may be available for recovery and reuse as surcharge (to pre-compress soft material at the base of the basin for improved consolidation) and ultimately act as a source of material for the capping layer beneath final pavement levels. Where possible, DPC will endeavour to make lands available to store this material during the operations to infill the Berth 52/53 basin; however, for the purposes of the

environmental assessment this been assumed to not be feasible, and all necessary surcharge (for consolidation of the basin) has been assumed to require importation.

Following consolidation settlement (expected to take up to two years), surcharge capping material will be relocated between the infilled Berth 52/53 basin to Terminal Road South to the west and to Alexandra Road Extension to the east to a depth of c.0.9m.

The infill area at Berth 52/53 and the raised area adjacent to the infill site will subsequently be surfaced using a combination of concrete slabs and bituminous surfacing or block paving for trafficked areas and trailer parking to provide circulation spaces as outlined under the MP2 Project. Post-surfacing, the area of Berth 52/53 will be raised approximately 1.4m above existing ground levels.

Where the existing Terminal 5 substation has not yet been demolished in advance of infilling operations (as consented under the MP2 Project) existing surface levels will be retained around the substation to avoid any impact on the building or cables. A buffer zone will be provided around the perimeter of the building, and a slope will be formed around the extremities to meet the surrounding raised levels. An up-stand wall will be provided along the top of the slopes, and an access ramp will be provided to retain vehicular access to the substation.

5.6.6 Material Import and Export

5.6.6.1 Material Import

Importation of materials for use as surcharge (amounting to c.54,500m^3) is expected. Following consolidation and settlement of recovered dredge material within the Berth 52/53 basin, this material will be subsequently relocated to a depth of c.0.9m across the footprint of the development area as capping in advance of the installation of permanent paving, resulting in typical raising of existing ground levels by 1.4m.

Following closure of the existing Berth 52/53 basin, the existing rock armour in Berth 52/53 provided to protect the embankments from erosion and wave action becomes redundant. It is proposed that Class A rock armour which is visible between the rim of the basin (3.3m OD/5.81m CD) and to a depth of -0.12m OD/2.39m CD could be conceivably recovered for reuse within the Port complex (equivalent to c. 2,333m^3). This protection layer will be removed during demolition works to a location within the Port Complex (location presently to be determined) to facilitate reuse in maintenance activities within the Port.

5.6.6.2 Material Export

As described in Section 5.5.1 there remains potential that not all of the sediment proposed to be dredged from Alexandra Basin West may be accommodated by infilling within the Berth 52/53 basin. In the unlikely event that surplus material is generated through the dredging and treatment (as a result of bulking), application of the various proposed treatment methodologies and settlement of the infill material the following mechanisms will be employed to manage any excess in line with the waste management hierarchy:

- Material to be dredged from Alexandra Basin West will be revised to implement a variable (reduced) dredging depth within Alexandra Basin West to minimise the generation of dredge sediments as far as practicable following qualification of dredging depths with the Harbour Master.
- Further identified excess dredge material which cannot be either eliminated from the dredging required to provide navigable depths in Alexandra Basin West or recovered at the Berth 52/53 basin will be recovered at a soil recovery or soil treatment facility in Ireland, subject to testing of the sediments in line with the selected facility's licence at the time of the works. This material will be exported to one of two potential licensed waste management facilities located <60km of the site by road for recovery as identified in Chapter 20. One site is located c.50km away, with travel via c.24km via Motorway (M50), c.15km National Road network (N7) with the remainder of the journey via local roads of c.11km. The other site is located c.30km away with travel via c.25km Motorway (M50/M1) and c.5km local roads. This may amount to the export of up to 60,085m3 by Heavy Goods Vehicles (HGV).
- In the very unlikely event that a soil recovery or soil treatment facility is not available in Ireland, recovery of any excess material at a soil recovery or soil treatment facility in Europe is preferential to disposal, subject to the testing of the sediments in line with the selected facility's licence at the time of the works. As outlined in Chapter 20 a range of available facilities which are licensed to receive the dredge material have been identified in Belgium and the Netherlands for recovery and reuse using soil washing techniques. For the purposes of this EIAR, as a conservative assessment, transport of the maximum expected volume of excess dredged spoil to facilities in both Belgium and the Netherlands for recovery have been assessed. These assessments have been undertaken on the basis that:
    - These materials will be generated (i.e. all identified risks limiting the volume of dredge which can be recovered and reused within the Berth 52/53 basin occur and DPC are unable to reduce proposed dredging depths across the basin to minimise material generation).
    - Transport to facilities in Belgium and Netherlands is undertaken by sea following dewatering operations undertaken at Dublin Port, with the identified facilities having berthing for direct transfer of shipped material for recovery at the receiving facility
    - Transport is undertaken using typical transport vessels with nominal 5,500t cargo capacity, despite a number of these sites having berthing capacity for larger vessels, to minimise storage of materials at Dublin Port pending export.

The following facilities (as outlined in Chapter 20) have been assessed for export of dredged sediments for further recovery in the event that this is required:

- Transport by road (HGV) from Dublin Port to Enva, Blackhall Walshestown Naas, Co. Kildare W91 CF30

- Transport by road (HGV) from Dublin Port to IMS Hollywood, Great Nag's Head, Naul, Co. Dublin A41 YE92
- Transport by sea from Dublin Port to RC Antwerpen, Scheldedijk 30-Haven 1025 (poort 4), 9120 Beveren-Kruibeke-Zwijndrecht, Belgium, requiring 21 round trips of vessels carrying 5,500t of cargo (1,260 nautical miles per round trip)
- Transport by sea from Dublin Port to Innovarec B.V. (Westdorpe) Autrichehavenweg 1, 4554 MB Westdorpe, Netherlands, requiring 21 round trips of vessels carrying 5,500t of cargo (1,214 nautical miles per round trip)
- Transport by sea from Dublin Port to 2. BMR Schiedam (Boskalis) Nieuwe Waterwegstraat 52, 3115 HE Schiedam, Netherlands, requiring 21 round trips of vessels carrying 5,500t of cargo (1,274 nautical miles per round trip)

5.6.7 Demolition Works

Marine infrastructure will be removed prior to infilling of the Berth 52/53 basin, including Ramp No. 7, and the existing Berth 52 before the basin is closed off from the navigation channel.

Demolition waste will be collected onsite for disposal by a licenced waste contractor. An Asbestos Management Survey was undertaken on the structures at Berth 52 and 53 to be demolished as part of the proposed works. Whilst no suspected asbestos containing materials were identified in these marine structures, limited access was available to the underside of these structures, therefore, they will be subject to a detailed asbestos survey prior to demolition.

Rock armour proposed to be recovered for reuse in maintenance activities within the Port (as outlined in **Section 5.6.6**) will be removed following closure of the Berth 52/53 basin.

Following the completion of infilling as outlined in **Section 5.6.4** with the excavation of the bunded structure of the treated material dredged during Phase 1 of the parent ABR Project, the existing storage bund will be decommissioned, this will include the demolition of the perimeter concrete containment walls with the area returned to hardstanding.

5.6.8 Plant Associated with Construction Process

5.6.8.1 Sediment Washing Plant

Soil and sediment washing is a technique used for the recovery/reuse of polluted and contaminated sediments. Soil washing is a flexible and proven process technology and is considered as the BAT for different contaminants including heavy metals and hydrocarbons. It is proposed that selected sources of sediments arising from dredging at Alexandra Basin West will be subjected to soil washing techniques appropriate to the source concentrations of contaminants. The treatment of soil and sediment by the intensive washing removes the pollutants, transferring them to the finest particles (silts and clays), from the solid phase to the liquid phase and allows the recovery of the inert fraction with coarser particle size (sands and gravels) for reuse on-site.

In the liquid phase, contaminants tend to bind to the finer inert fraction (silts and clays). This produces a wastewater flow containing suspended solids and pollutants which is sent to treatment of purification and clarification. The clarified water is reused in the washing process by a closed cycle loop, while the residual fine soil content, containing the pollutants, is proposed to be subjected to S/S treatment as required by the residual contamination within this fraction.

The process waters used to wash the sediment materials are subject to appropriate physical and chemical clarification and reused in a closed circuit, without any dispersion to the surrounding environment.

Soil washing mobile plant consists of modular units as required to provide operational and process flexibility to treat different types of soils, sediments and matrices, and manage a wide range of contaminants with variable concentrations. Capacity of modular plants are dependent on the process requirements being undertaken, and in the case of mid-capacity plants throughput can be of the order of 50-100m^3/hr, occupying a footprint of up to 40m x 80m. An exemplar of a modular soil washing treatment plant is outlined in **Figure 5-11** below.

The soil washing treatment plant will be brought to the treatment area by road on low-loaders or by sea and set up on site. Plant and equipment will be installed on concrete hardstanding areas.



Figure 5-11: Exemplar of a Modular Soil Washing Plant

5.6.8.2 Stabilisation/Solidification Treatment Plant

Some of the specialty S/S contractors have developed or modified a variety of mixing equipment to meet specific project requirements. Conventional mixing techniques, including the use of spaders and screening/mixing buckets are used in the ex-situ application. The plant will be designed and scaled according to the volume to be treated and mitigation measures will be implemented in the design of the plant, so as to minimise the impact on the surrounding environment. Assessments undertaken as part of the EIAR relate to the maximum anticipated plant sizes and material throughputs.

The dredged material will be fed to the S/S treatment process from the reception area by a grab and transferred by conveyor/chutes to the reaction vessel where mixing will take place.

The S/S treatment process will be performed within a controlled reaction vessel with a sufficient degree of process control to ensure the correct ratios of untreated sediment and reagent/binder enter the process and that sufficient mixing (and residence time) is achieved. The process will be automated to ensure that loading, charging and the mixing device(s) can be monitored and controlled. With the data acquisition and control system, the operator will control all the functions of the process and the stabilisation equipment, including accurately setting the amount of the binder to be fed into the dredged sediments. Binders will be fed dry or wet as required to the stabilisation equipment. **Figure 5-12** indicates the typical S/S treatment process which will be undertaken.

Stop/start sequences will be programmed to minimise emissions. A stop procedure will also be developed to minimise emissions to the environment during malfunctions, breakdowns and momentary stoppages. Bulk transfer of dry reagent/binder will be undertaken by screw feeders, gravity or pneumatic means. Where possible, dry reagent/binder will be stored by enclosed storage e.g. silos, bunkers, hoppers and containers.

The S/S treatment plant will be brought to the treatment area by road on low-loaders or by sea and set up on site. Plant and equipment will be installed on concrete hardstanding areas.

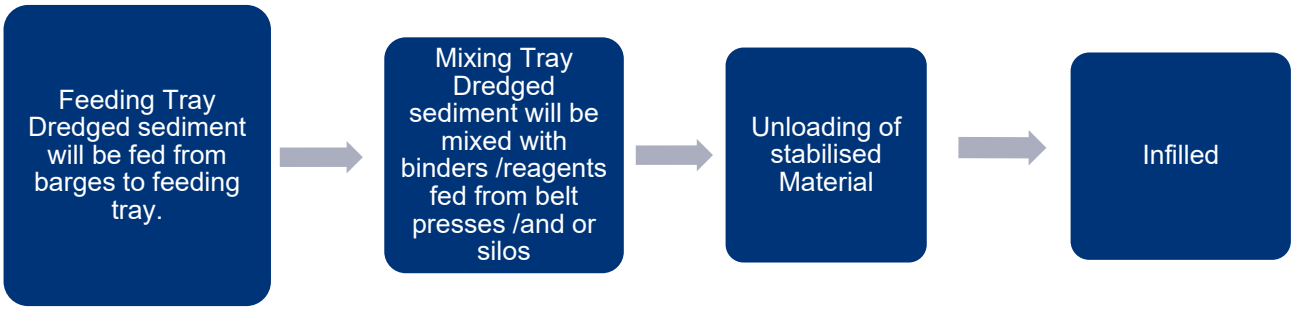


Figure 5-12: S/S Treatment Process

A single S/S plant as utilised in Phase 1 of the parent ABR Project (shown below in **Figure 5-13**) had a potential nominal treatment capacity of c. 1,000m^3/day. As the plant will be designed and scaled according to the volume to be treated it has been assumed that 2 Nr equivalent plants will be provided in Phase 2 of the ABR2 Project, occupying a nominal total footprint of 30m x 40m, with peak capacity to manage treatment of sediments generated by peak daily dredge rates.

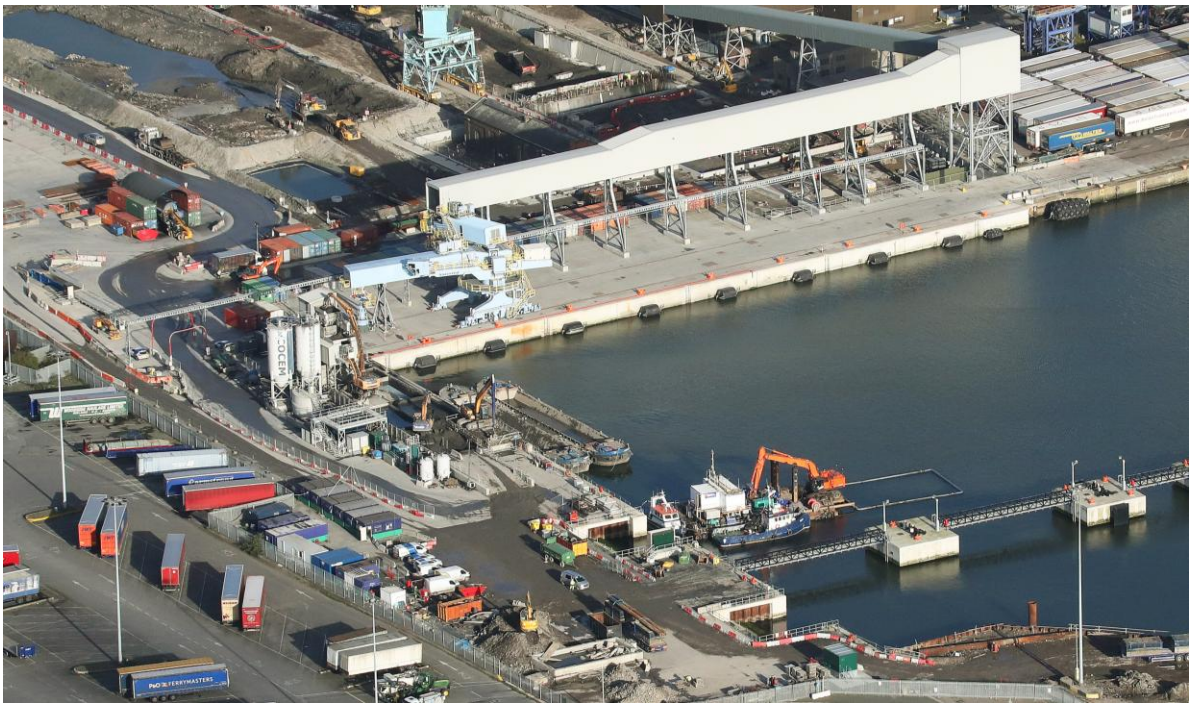


Figure 5-13: S/S Treatment Plant utilised in Phase 1 of the parent ABR Project

5.6.8.3 Wastewater Treatment Plant

Through appropriate site layout and design of surface water collection systems, uncontaminated water will be kept separate from contaminated water, and good housekeeping measures will be utilised to minimise the potential for cross-contamination.

The existing IE licence accounts for the provision of two Wastewater Treatment Works within the licensed boundary. For the purposes of the assessment, it is assumed that the combined discharge from these treatment works does not exceed either:

- The prescribed limits outlined in Schedule B2 of the IE licence (6.9l/s at Emission Limit Values (ELVs) outlined in the licence); or
- Combined discharge at a rate of up to 69l/s with a corresponding reduction in contaminant concentrations to retain the equivalent mass balance (subject to a review of the IE licence as outlined in Section 5.6.2).

Assessments undertaken as part of the EIAR relate to the maximum anticipated plant sizes and material throughputs. During the construction phase of the works, any contaminated water arising from the sediment handling process will be required to be managed, should dewatering be required. A water treatment plant will comprise a single lane treatment process to remove suspended solids, product and contaminants (if present) from the wastewater produced from dewatering and treatment processes. The volume of water to be treated will be determined by the amount of water to be removed prior to the treatment process and the wastewater treatment plant will be sized accordingly.

The wastewater will be pumped from the treatment area into a settlement holding tank/lagoon. From the tank/lagoon, water will be directed through a separator (Class 1 Full Retention) to prevent suspended solids and oil from entering the treatment process. From the separator, the remaining water will be directed through a sand filter to remove further suspended solids, and an activated carbon vessel to remove any organic contaminants before discharge via a designated discharge point to Alexandra Basin West or the Berth 52/53 basin as applicable. Sampling points will be included within the pipe work system to allow for the collection of water samples. The proposed sampling and testing schedule will be based on flow and effluent quality prior to discharge. The sand filter and activated carbon will be replaced as required. These will be disposed of to a licensed facility. **Figure 5-14** below indicates the typical wastewater treatment plant process which will be undertaken.



Figure 5-14: Wastewater Treatment Plant Process

5.6.8.4 Construction Plant

The levels of construction plant (excavators, trucks etc) at various stages of the construction process will be dependent on the rate at which material dredged from Alexandra Basin West will be received on to land, which may be expected to occasionally peak at up to 4,000m^3/day. The associated dredge treatment plants will be scaled according to the volume of material to be treated. Where daily dredging rates exceed treatment capacity on a given day, surplus sediments generated over and above the installed treatment capacity will be stockpiled locally to the relevant treatment plant for treatment on subsequent days where dredging rates do not exceed treatment capacity.

5.6.8.5 Ancillary Plant

5.6.8.5.1 Wheel Wash

The contractor will be required to ensure that the internal Port road network, and all local roads, including the access road to the site, are maintained and kept clean as far as is reasonably practicable. This shall be achieved by providing a self-contained wheel wash and sufficient hard standing area for parked vehicles within the site working areas.

In addition to this, road sweepers will be used to ensure local roads are kept clean and free of debris which may have originated from the site and associated construction activities.

5.6.8.5.2 Laboratory Facilities

Laboratory facilities may also be required onsite for certain testing requirements or, alternatively, testing will be undertaken at accredited external laboratories. It is proposed that necessary samples shall be

taken and adequate facilities will be put in place to facilitate the preparation and storage of samples for the duration of the treatment phase of the dredged materials recovered from Alexandra Basin West. Other samples will be sent to an accredited laboratory for independent analysis where required.

It will be necessary as part of the quality control of the treatment processes to undertake analysis on the treated dredge material including leachability tests using the standardised CEN (European Committee for Standardisation) leaching procedures and compressive strength. All samples will be required to be kept for a specified length of time for analysis to take into account the curing time and time taken to achieve full stability in the case of materials subjected to S/S treatment. This will provide assurances that the necessary process input controls are in place and that treated dredge material are in compliance with the project specification.

The frequency of sampling for the project will be in line with requirements outlined in the IE licence.

5.6.8.5.3 Design and Location of Fuel Storage Areas

Fuel required for mechanical excavators and generators on-site shall be contained in a designated fuel location to ensure that surface water and ground water is protected from potential adverse impacts.

5.6.8.5.4 Quarantine Area

Where laboratory analysis has shown a non-conformity to the project specification, the rejection procedure shall be implemented. Measures to remove and dispose/recover such materials will be undertaken in accordance with the CEMP. Such measures will include the provision of a waste quarantine area where the material will be placed pending removal if deemed necessary. These quarantine areas are indicated for each of the treatment scenarios within the working area in **Figure 5-7** of the North Wall Quay Extension; for working areas within Berth 49 and Berth 52 West, any quarantine requirements would be accommodated as required within the stockpile areas indicated in **Figure 5-8** and **Figure 5-9** respectively.

5.6.8.5.5 Sediment Handling

It is proposed to treat the sediment through soil washing and a S/S treatment process as applicable. In the case of S/S process, stabilisation equipment can be an efficient and well-functioning technique for the treatment of contaminated sediments. The stabilisation and the immobilisation of the fine particles start immediately after mixing. The process allows accurate proportioning of additives with the sediments.

The additives, water and contaminated sediments will be loaded into the stationary mixing drum in the correct proportions, where it is blended into a mortar consistency and then discharged into a ready-mix truck or the hopper of a concrete pump for transport to the recovery area. The binder/additives will be transported to site via sea or in tank lorries and stored in silos or in stacks under cover at the treatment area.

Any transfer of materials from Alexandra Basin West and the North Wall Quay Extension to the Berth 52/53 basin will be undertaken by barge. Removal of materials from the North Wall Quay Extension to external recovery facilities will be undertaken by HGV and road transport.

Material received or treated at Berth 49 or Berth 52 West may be transferred to the infill area at the Berth 52/53 basin by contained conveyance system, or alternatively by road haulage within the Port Estate. Removal of materials from Berth 49 or Berth 52 West to external recovery facilities will be undertaken by HGV and road transport.

5.6.9 Decommissioning of Treatment Infrastructure

Decommissioning of treatment infrastructure associated with soil washing, S/S treatment plants and Wastewater Treatment Works will be undertaken as part of the construction phase of the ABR2 Project in accordance with an Environmental Management Programme incorporating plans submitted to, and agreed with, the EPA in line with the IE licence for these activities. This includes a Closure, Restoration and Aftercare Management Plan (CRAMP) outlining measures to decommission, render safe or remove for disposal/recovery any soil, subsoil, buildings, plant or equipment, or any waste, materials or substances that may result in environmental pollution.

Decommissioning works on completion of treatment activities will therefore include:

- Full decontamination and decommissioning of all soil washing, S/S process treatment equipment and Wastewater Treatment Works using standard procedures and authorised contractors, this will include any associated temporary building and equipment off-site;
- Recovery on-site of all treated contaminated dredged material;
- All excess raw materials removed from site;
- All storage areas fully emptied and stored material transported or disposed of;
- All waste disposed of or recovered in a manner that complies with regulatory requirements;
- All site services fully decontaminated, decommissioned and verified;
- All relevant records relating to waste and materials movement, transfer or disposal will be managed and retained throughout the closure process; and
- Independent verification and certification of clean closure status.

5.6.10 Construction Sequence Summary

5.6.10.1 Phasing

The phasing and sequencing of the construction activities for the proposed works of the ABR2 Project is outlined below (however, the dates indicated may change, depending upon factors including the date upon which consents may be granted):

- Demolition works of marine infrastructure within the Berth 52/53 basin (anticipated Q4 2028);

- Phase 2 of capital dredging to be undertaken within Alexandra Basin West (Q1 2029 – Q4 2030);
- Remediation of dredged materials at the North Wall Quay Extension and/or Berth 49, and/or Berth 52 West (subject to operational constraints and land availability) (Q1 2029 – Q4 2030);
- Infilling of the Berth 52/53 basin using remediated dredged sediments recovered during Phase 2 of capital dredging (Q1 2029 – Q4 2030);
- Infilling of the Berth 52/53 basin with the existing stockpile of remediated dredged sediments recovered during Phase 1 of the parent ABR Project (Q4 2030 – Q1 2031);
- Provision of impermeable capping to infilled sediments within the Berth 52/53 basin (Q4 2030 – Q1 2031);
- Installation of band drains into underlying sediments (if required) with the import and placement of c. 2m depth surcharge materials to accelerate consolidation of infilled materials and underlying existing strata of the Berth 52/53 basin (Q4 2030 – Q2 2031);
- Following completion of consolidation and settlement of the infilled material, excavation and relocation of the surcharge materials will occur to raise ground levels (capping) within the wider Terminal 5 area, between the infilled Berth 52/53 basin to Terminal Road South to the west and to Alexandra Road Extension to the east (anticipated throughout 2033); and
- Provision of final surfacing (as consented under the MP2 Project planning permission).

5.6.10.2 Site Compounds and Working Areas

5.6.10.2.1 Security

Throughout the construction period, the site will be made secure from trespassers for the duration of the construction works.

5.6.10.2.2 Site Compounds and Working Areas

As outlined above in **Section 5.6.3**, there are a number of potential site compounds and working areas which may be utilised during the construction period dependent upon operational constraints within the Port. At the commencement of construction, site compounds will be established as required (indicated in **Figure 5-7 – Figure 5-9**). It is anticipated that approximately 30 construction personnel may be located on-site at any one time. Accommodation and site facilities will be provided to accommodate these numbers, including site offices, welfare facilities, storage areas, canteen facilities and a laboratory. These facilities will be provided through the use of temporary modular buildings as required.

5.6.10.2.3 Working Hours

The current IE licence facilitates operation of the treatment infrastructure between the hours of:

- 08:00 and 18:00 on Monday to Friday.

- 08:00 and 13:00 on Saturday.

The current IE licence additionally states that there will be no activity on Sundays or Bank Holidays. Amendments to these restricted operational hours may be otherwise agreed with the EPA, subject to operational hours consented by planning.

In the case of dredging activities, where construction activity takes place for the development in the vicinity of residential properties, the activities operate between the hours of 07:00 and 19:00 Monday to Friday and between 08:00 and 13:00 on Saturday. There will be no activity on Sundays or Bank Holidays, unless a derogation to permit these works is provided by DCC.

Due to operational constraints in the Port, it is proposed that dredging activities will be undertaken on a 24-hour basis, 7 days per week within specific areas of Alexandra Basin West, where possible, as noted above in **Section 5.6.1**. For the treatment of sediment and infilling activities, these may occur between the hours of 07:00 to 23:00, dependent upon the location of possible treatment activities, as noted above in **Section 5.6.3. Table 5-1** denotes the proposed limits of working hours applicable to the various potential activity locations, based on the known local sensitivities.

Table 5-1: ABR2 Working Hours by Location

Activity	Working Hours		
	Daytime (07:00-19:00)	**Evening (19:00-23:00)**	**Nighttime (23:00-07:00)**
Dredge Area 1	Yes	Yes	Yes
Dredge Area 2	Yes	Yes	No
Dredge Area 3	Yes	Yes	No
Dredge Area 4	Yes	Yes	Yes
Barge Transportation of Dredged Material	Yes	Yes	Yes
Dredged Material Offloading at the North Wall Quay Extension	Yes	No	No
Dredged Material Offloading at Berth 49 or Berth 52/53	Yes	Yes	No
Mechanical treatment, separation and washing of dredged material at the North Wall Quay Extension	Yes	No	No

Activity	Working Hours		
	Daytime (07:00-19:00)	Evening (19:00-23:00)	Nighttime (23:00-07:00)
All treatment activity types at Berth 49 or Berth 52/53	Yes	Yes	No
Infilling activity at the Berth 52/53 basin	Yes	Yes	No
Wastewater processing and discharge at the North Wall Quay Extension	Yes	Yes	Yes
Wastewater processing and discharge at Berth 49 or Berth 52/53	Yes	Yes	Yes

The wastewater processing and discharge activities will continue during the night with mitigation in place to reduce the noise generated at source to ensure compliance with Best Practice British Standards Construction Guidelines.

5.6.10.3 Construction Traffic

Construction traffic will arrive at and depart from the Port via the national road network. All HGV movements will comply with the DCC HGV Management Strategy. Within the Dublin Port Estate, traffic will be routed through the existing road network to reach the proposed ABR2 Project site.

Regarding the importation and exportation of material from the site, it has been estimated that this will generate five arrivals to the site of vehicles per working hour (on assumption of a 10-hour working day) and five departures from the site per working hour.

5.6.10.4 Construction Environmental Protection Measures

A series of ABR2 Project construction environmental protection measures have been developed through the preparation of this EIAR and details of the proposed mitigation are set out in individual chapters dealing with the various relevant environmental factors, and an ABR2 Project-specific CEMP has been prepared to ensure effective implementation of required mitigation and best practice measures.

The preparation of the environmental appraisals was guided by the requirements of EU Directives and Irish law regarding Environmental Impact Assessment. The following legal provisions and guidelines, amongst others, were followed:

- The requirements of EU Directives (Directive 2011/92/EU as amended by 2014/52/EU) and Irish law regarding Environmental Impact Assessment (including the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, as amended);
- European Commission Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by Directive 2014/52/EU) (European Commission, 2017);
- The Planning and Development Act 2000 (as amended); and
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).

Detailed project consultation and scoping is described in Chapter 3 of this report. Scoping was undertaken in respect of the ABR2 Project in accordance with the European Commission's 2017 "Environmental Impact Assessment of Projects Guidance on Scoping", the EPA's 2022 "Guidelines on the information to be contained in Environmental Impact Assessment Reports", and greatly benefitted from the environmental monitoring programme which is currently in place for the construction of the parent ABR Project and the MP2 Project. The site-specific scientific data collected to date has been used to support the preparation of the EIAR and NIS for the ABR2 Project and facilitates an in-depth understanding of the environment in and around Dublin Port, including the inner Liffey channel, Alexandra Basin West and the Berth 52/53 basin. The scope of the ABR2 Project was further considered in the context of the extensive environmental datasets collated during the preparation of the Strategic Environmental Assessment (SEA) which complemented the review of the Dublin Port Masterplan during 2017 and 2018. Above all, the extensive consultation process undertaken during both the review of the Dublin Port Masterplan and specifically for the ABR2 Project provided a sound basis for confirming the key issues to be addressed, the extent of the environmental appraisals required, and the level to which these issues needed to be addressed.

Following the scoping process, all environmental topics required by the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) have been comprehensively addressed within the EIAR.

Once the key issues were identified, baseline studies/surveys were carried out. The studies enabled the prediction of the likely environmental impacts arising from the ABR2 Project. These impacts have been evaluated in terms of their significance, nature and magnitude with mitigation measures proposed to address these impacts as far as possible.

Mitigation by avoidance has also been used, where possible. Following an examination, analysis and evaluation of the direct and indirect significant effects of the project in relation to the receiving environment, additional mitigation measures and monitoring programmes have been recommended which will be effectively implemented during the construction phase of the ABR2 Project. These include a range of noise, dust and construction traffic mitigation measures to minimise nuisance to neighbouring communities during construction. Precautionary measures will be undertaken to minimise the risk of injury or disturbance to marine mammals in the area of operations in line with National Parks and Wildlife

Service (NPWS) Guidelines (2014). Notably a trained and experienced Marine Mammal Observer (MMO) will be put in place during dredging and demolition operations. The MMO will scan the surrounding area to ensure no marine mammals are in a predetermined exclusion zone in the 30-minute period prior to operations. The NPWS exclusion zone is 500m for dredging and demolition works. **Chapter 21** of the EIAR sets out all of the mitigation measures and monitoring programmes which will be implemented during the construction phase of the ABR2 Project.

5.6.10.5 Construction Environmental Management

The ABR2 Project construction works will be undertaken in compliance with a finalised CEMP which will include all measures identified in the CEMP submitted with the planning application, as well as any additional measures required pursuant to development consent. A CEMP has been prepared to enable comprehensive assessment of the construction phase of the ABR2 Project and forms part of the application for permission (under separate cover).

5.7 Operation, Maintenance and Decommissioning Phases

The works proposed to be undertaken as part of the proposed ABR2 Project are required to complete elements of work previously permitted under the parent ABR Project. These are, in effect, accommodation works required to facilitate the development of the separately consented MP2 Project. It is not proposed or envisaged that any of the works proposed under the ABR2 Project will be decommissioned in the future, aside from the temporary treatment plants established for the recovery of dredged sediments as outlined in **Section 5.6.9**.

The ABR2 Project dredging and sediment treatment process aims to address legacy contamination within Alexandra Basin West. Following completion of dredging, some siltation of the basin may occur, however, the water depth is such that this is unlikely to cause any significant problem in the short term. Any maintenance dredging which may be required in the longer term will likely be carried out as part of DPC's regular maintenance dredging programme. The material generated would likely be disposed of at sea at a licensed disposal site, subject to further chemical testing demonstrating the suitability of the dredged material for disposal at sea and to be agreed in accordance with DPC's maintenance dredging licence. This has been standard practice for DPC for decades.

Following completion of infilling activities north of the new Riverside Berth 52, the Unified Ferry Terminal, as consented under the MP2 Project, would be complete.

The operation and maintenance of the remaining MP2 Project development works which have not yet been completed will be as outlined in the documents supporting the planning consent for the MP2 Project. Summaries of the services and operation of the area around the basin at Berth 52/53 following completion of the ABR2 Project accommodation works are summarised below.

5.7.1.1 Stormwater Drainage

The previously consented drainage proposals in the MP2 Project outlined the extensions of existing outfalls within the existing basin to relocated outfalls at the new Berth 52.

5.7.1.2 Wastewater Drainage

There are no envisaged additional wastewater discharges to public sewers as a result of the ABR2 Project.

5.7.1.3 Lighting

It is proposed to utilise the existing High Mast Lighting and Street Lighting (already consented under the MP2 Project) where required to provide required luminance and uniformity.

5.7.1.4 Navigation

The proposed development will require updating of the appropriate navigation charts for the area. This will be completed through consultation with the UK Hydrographic Office. Global Positioning System navigation charts will be updated based on updates to Navigation Charts. The development will not impact on other aspects of navigation in the Port. The navigation speed limit enforceable within the harbour will apply to all new facilities. Impacts on radar, or Very High Frequency (VHF) radio and other communication systems are not envisaged. Marine Notices will be issued to alert the port users and the general public to the proposed changes to the Port.

5.8 Description of the Risk of Major Accident Hazards

DPC is responsible for the safe management, control, operation and development of the Port, and is committed to ensuring the safety of its employees and other persons affected by its activities. The potential risk of major accident hazards can arise during both the construction and operational phases of the ABR2 Project. There are no substances or technologies being proposed that are not considered 'normal' either by the construction industry or by Port operations. Risk of accident is managed by strict adherence to DPC's Health and Safety Policy and supporting accredited documentation.

The proposed development is within the vicinity of several establishments that fall within the scope of the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, 2015 (the COMAH Regulations) including the NORA fuel storage establishments that are notified to the Health and Safety Authority as an Upper Tier Seveso site. In light of the nature of the activities that will take place at the ABR2 Project site, and the nature of the surrounding environment, the most significant risks of major accidents and disasters are associated with the COMAH establishments.

The assessment of the risk of major accidents and disasters is presented in **Chapter 6** of this EIAR which concludes that, from a COMAH perspective, the potential direct and indirect risks arising from the ABR2 Project satisfy the Health and Safety Authority's COMAH land use planning guidance. It also concludes that other, non-COMAH direct and indirect major accident and disaster risks arising from the ABR2 Project are not significantly different from the current risks.

DPC has developed a comprehensive Emergency Management Plan that caters for the range of accident and emergency events that may occur within its estate (or that may occur outside the estate and that have a direct, knock-on effect), and this plan is provided to the other relevant stakeholders,

including An Garda Síochána, DCC, Transport Infrastructure Ireland, and the Principal Response Agencies. In the event of an incident at a COMAH establishment that could impact on people at other facilities in the Port, or on road traffic entering or exiting the Port, DPC will activate its Emergency Management Plan, in which case people would be directed away from the source of the hazard.

5.9 Decommissioning

Following completion of the construction phase of the works, all temporary works required to facilitate project construction will be removed from site.

It is not planned or envisaged that the permanent marine elements of the ABR2 Project will be decommissioned given the nature of port development which can be considered as 'permanent works', with a 100-year design life.

The landside elements of the ABR2 Project have been designed as far as possible to allow for maximum flexibility to ensure sufficient space is available for future port activities including the delivery of the Unified Ferry Terminal as consented under the MP2 Project. To provide this flexibility, the proposed landside structures have been kept to a minimum, with building locations guided by existing services and minimising disruption to the overall flow of the Port.