

REPORT

South Bank Quay

Non-Technical Summary

Client: Tees Valley Combined Authority

Reference: PC1084-RHD-ZZ-XX-RP-Z-1108

Status: S0/P01.01

Date: 29 October 2020

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1 INTRODUCTION

1.1 Background

South Tees Development Corporation (STDC) is proposing to construct a new quay at South Bank in the Tees estuary (referred to hereafter as the proposed scheme). The proposed scheme is required to support STDC's landside proposals for general industry and storage or distribution uses within part of the South Industrial Zone. It is envisaged that the new quay would be utilised predominantly by the renewable energy industry, as well as supporting more general industrial and storage/distribution activities.

In summary, the proposed scheme comprises demolition, capital dredging, offshore disposal of dredged material and construction and operation of a new quay (to be set back into the riverbank). **Drawing PC1084-RHD-SB-DN-DR-C-1380** presents a general arrangement of the proposed scheme, **Drawing PC1084-RHD-SB-DN-DR-C-1383** shows the proposed quay in plan view and **Drawing PC1084-RHD-EN-DR-EV-1113** shows the proposed dredge (and excavation in front of the proposed quay wall) footprint.

The proposed scheme has been subject to an Environmental Impact Assessment (EIA) which has assessed the potential environmental impacts of constructing and operating the proposed scheme. This document is the Non-Technical Summary (NTS) of the EIA Report, which has been submitted to the Marine Management Organisation (MMO) in support of a marine licence application and Redcar and Cleveland Borough Council (RCBC) in support of a planning application.

2 NEED FOR THE PROPOSED SCHEME

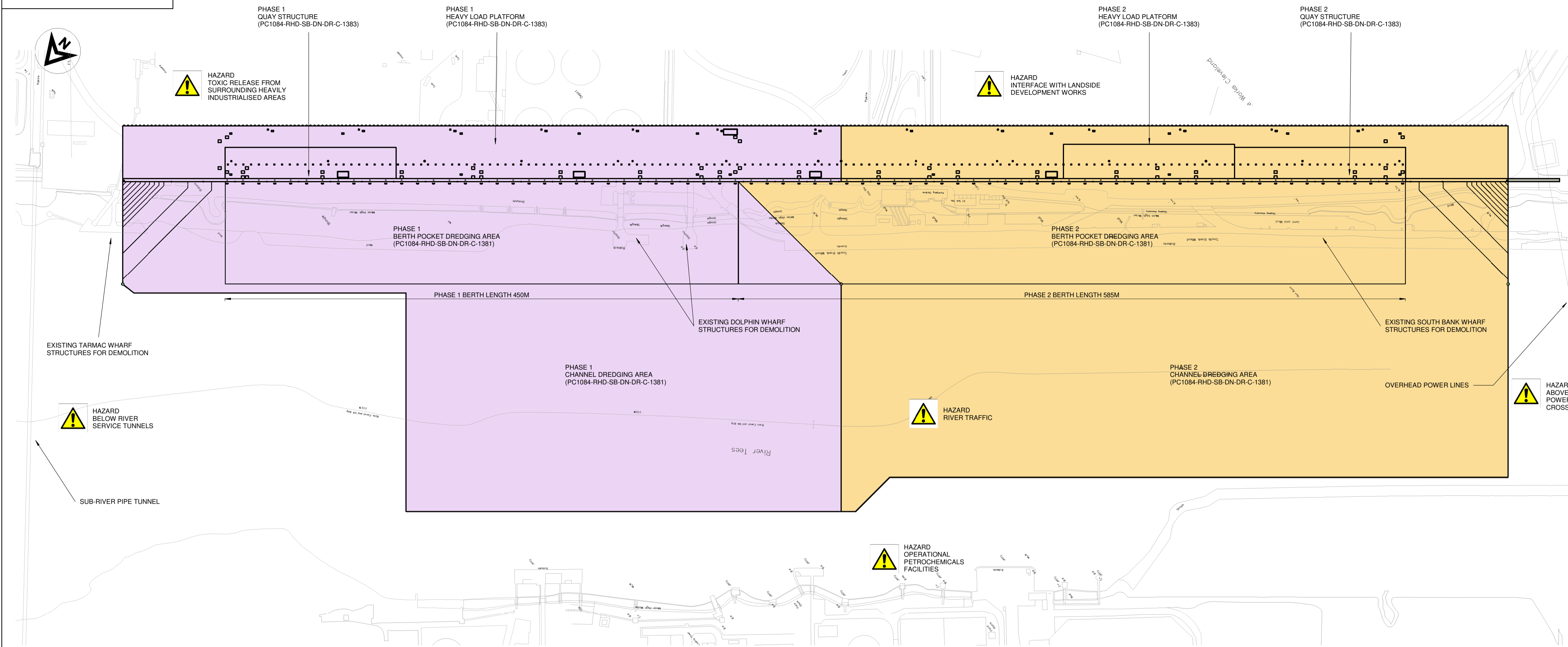
The proposed scheme is required to directly support the economic regeneration plans being progressed by STDC within the Tees Valley region. Of relevance is the outline planning application submitted by STDC in June 2020 to RCBC on land within the South Industrial Zone (reference R/2020/0357/OOM), immediately landward of the proposed scheme footprint.

The outline planning application was submitted in June 2020 to allow the development of up to 418,000m² of general industry and storage or distribution facilities on land at South Bank. The proposed scheme which is the subject of this report is specifically linked to the proposed development of the backing land at South Bank; a quay is required to support with the import and export of materials / products associated with the development of such land. Such requirements have therefore driven the proposed scheme's location with the Tees estuary, and specifically at the South Bank site in the South Industrial Zone.

3 DESCRIPTION OF THE CONSTRUCTION PHASE

The construction phase of the proposed scheme would comprise the following main elements:

- Demolition of the dilapidated wharf, three jetties downstream of the wharf (including the conveyor at the extreme downstream end jetty), a live electrical substation and pipework which previously abstracted water from the Tees estuary associated with the pumping station.
- Construction of a new solid piled quay structure up to 30m wide and 1,230m in length (with an approximate 1,050m of usable quay for berthing), set back into the riverbank. Although the useable surface of the quay itself would be up to 30m wide, the overall footprint of the quay would be up to 50m wide due to the proposals to construct an anchor structure further inland of the quay deck. The exact alignment of the quay is currently undefined and, therefore, for the purposes of the assessment, a maximum quay envelope of 1,300m x 75m has been defined and assessed.



GENERAL ARRANGEMENT

1 : 2000



NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ALL LEVELS ARE IN METRES RELATIVE TO CHART DATUM (MCD) UNLESS NOTED OTHERWISE

KEY:

- PHASE 1 DEVELOPMENT AREA
- PHASE 2 DEVELOPMENT AREA

REV	DATE	DESCRIPTION	CH	CF	TJR
P01	24.08.20	FOR REVIEW AND COMMENT			

REV	DATE	DESCRIPTION	DRW	CHK	APR

REVISIONS

CLIENT



PROJECT

TEES STUDY

TITLE

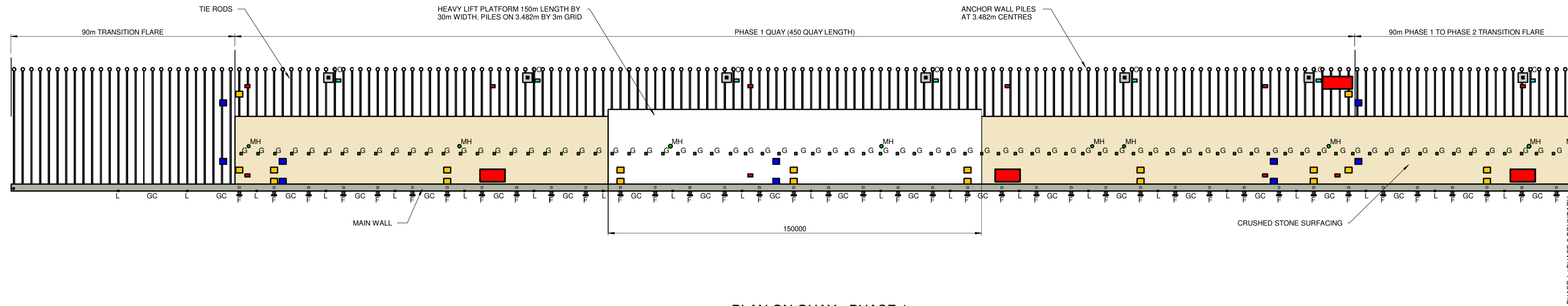
CONCEPT DESIGN
GENERAL ARRANGEMENT



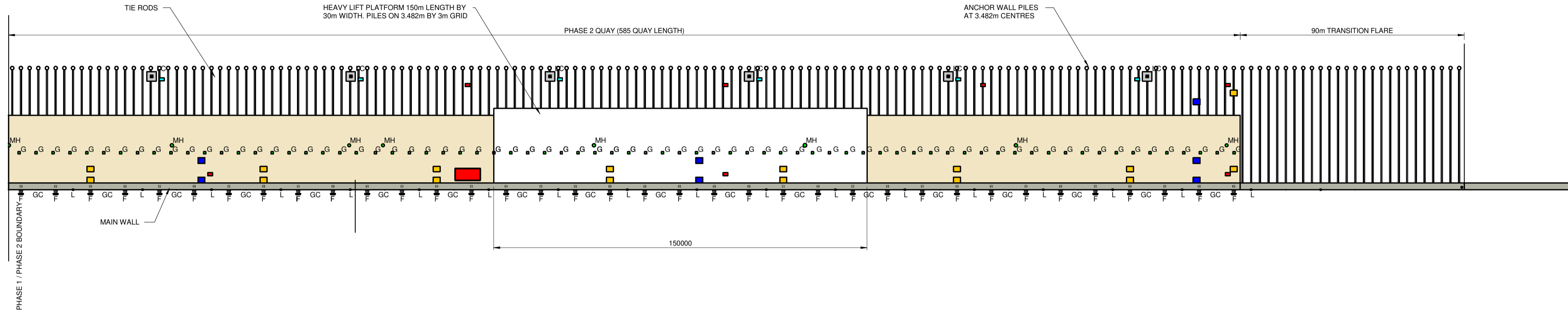
DRAWN	CH	CHECKED	CF	APPROVED	TJR

DATE	24/08/20	SCALE	AT A1	As indicated	REF.

DRAWING No.	SUITABILITY	REVISION
PC1084-RHD-SB-DN-DR-C-1380	S3	P01



PLAN ON QUAY - PHASE 1
1 : 1000



PLAN ON QUAY - PHASE 2
1 : 1000

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ALL LEVELS ARE IN METRES RELATIVE TO CHART DATUM (mCD) UNLESS NOTED OTHERWISE

KEY:

- G GULLY
- LC LIGHTING COULUMN
- F FENDER
- GC GRAB CHAIN
- L LADDER
- MH MANHOLE
- ☐ BOLLARD
- POTABLE WATER SYSTEM (REFER TO DRAWING PC1084-RHD-SB-DN-DR-C-1387)
- FIRE WATER SYSTEM (REFER TO DRAWING PC1084-RHD-SB-DN-DR-C-1387)
- LV ELECTRICAL SYSTEM (REFER TO DRAWING PC1084-RHD-SB-DN-DR-C-1386)
- HV ELECTRICAL SYSTEM (REFER TO DRAWING PC1084-RHD-SB-DN-DR-C-1386)
- DRAINAGE SYSTEM (REFER TO DRAWING PC1084-RHD-SB-DN-DR-C-1385)
- SURFACING

REV	DATE	DESCRIPTION	DRW	CHK	APR
P01	24.08.20	FOR REVIEW AND COMMENT	CH	CF	TJR

REVISIONS

CLIENT



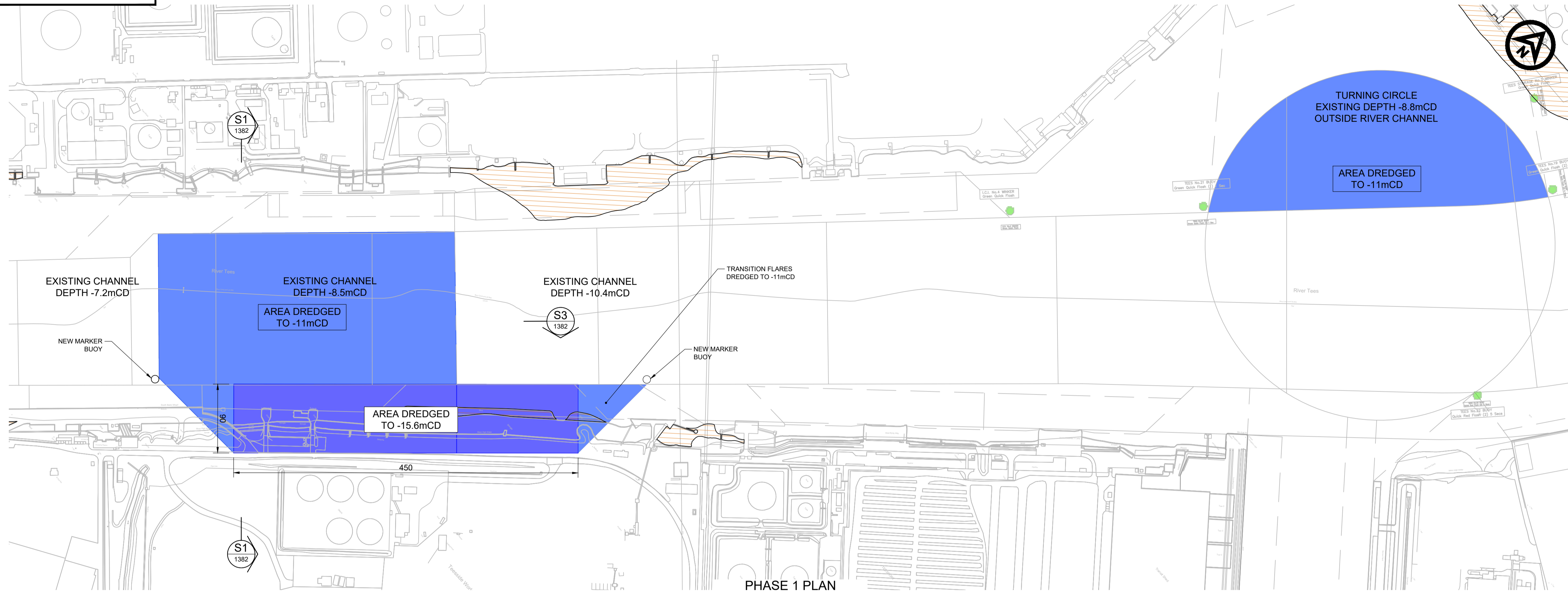
PROJECT
TEES STUDY

TITLE
CONCEPT DESIGN
QUAY PLAN

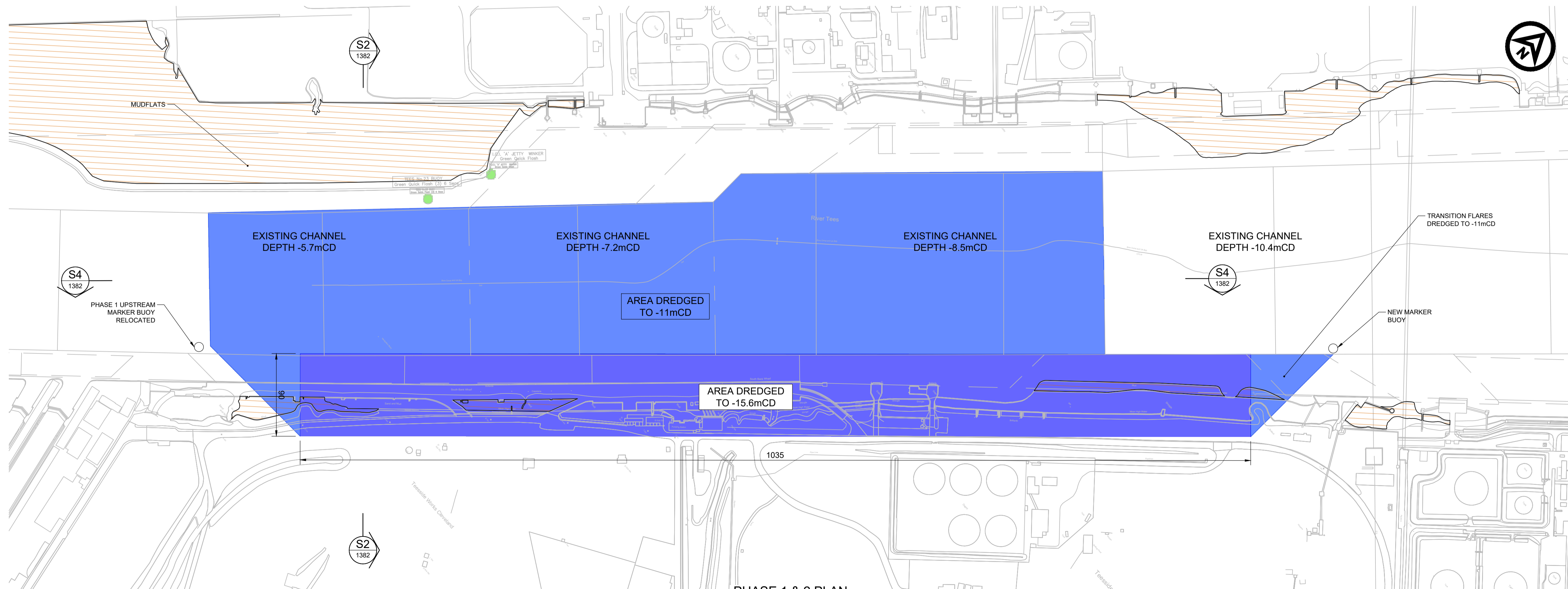


DRAWN	CH	CHECKED	CF	APPROVED	TJR
DATE	24/08/20	SCALE	As indicated	REF.	

DRAWING No.	SUITABILITY	REVISION
PC1084-RHD-SB-DN-DR-C-1383	S3	P01



PHASE 1 PLAN
SCALE 1:3000



PHASE 1 & 2 PLAN
SCALE 1:2500

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES RELATIVE TO ORDNANCE DATUM NEWLYN (mOD). FOR RELATIONSHIP BETWEEN ORDNANCE DATUM AND CHART DATUM REFER TO DIAGRAM BELOW.
3. REPORTED AREAS OF MUDFLAT EXTRACTED FROM NATURAL ENGLAND'S PRIORITY HABITAT INVENTORY DATA SET.

KEY:

- DREDGE TO -11.0mCD
- DREDGE TO -15.6mCD
- MUDFLATS

PO1	28.10.20	FOR REVIEW AND COMMENT	CC	CF	TJR
REV	DATE	DESCRIPTION	BY	CHK	APP

REVISIONS

CLIENT



PROJECT

TEES STUDY

TITLE

DREDGING PLAN



DRAWN	CC	CHECKED	CF	APPROVED	TJR
DATE	28.10.20	SCALE	AS SHOWN	REF.	

DRAWING No.	PC1084-RHD-SB-EN-DR-EV-1113	SUITABILITY	S3	REVISION	P01
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- Excavation and re-use of approximately 275,000m³ of soils behind the proposed quay wall to install tie rods to the anchor wall. Excavation and re-use of a further approximately 1,140,000m³ of soils in front of the proposed quay wall to create the berth pocket.
- Capital dredging of approximately 1,800,000m³ of marine sediments with offshore disposal into the Tees Bay C disposal site. It is proposed that dredging is undertaken using a trailing suction hopper dredger (TSHD) and a backhoe dredger.
- Installation of approximately 200,000m³ of rock within the berth pocket to form a rock blanket.

STDC is intending to commence construction during 2021 to enable operation of the facility by 2023 (an approximately three-year construction phase). It is proposed that the quay is constructed in phases, with an initial berth length of approximately 450m proposed in Phase 1 (total quay length of approximately 630m). The quay would be extended to provide a total useable berth length of 1,050m (total quay length of approximately 1,230m) as required in Phase 2, based on market demands.

4 DESCRIPTION OF THE OPERATIONAL PHASE

During the operational phase, it is envisaged that the proposed quay would be utilised predominantly to support with the construction of offshore wind farms, as well as supporting more general industrial and storage/distribution activities linked to the works to be undertaken within the general industrial units proposed for the backing land (which have been subject to a separate planning application and EIA).

With regard to the wind farm industry, it has been assumed that the quay would be used to support both staging (pre-assembly and storage) and manufacturing of wind farm components.

It has been estimated that up to 390 offshore wind vessel calls would take place at the facility on an annual basis. This includes approximately 300 vessel calls per year associated with offshore wind staging and 90 vessel calls per year associated with offshore wind manufacturing activities.

5 ALTERNATIVE OPTIONS CONSIDERED

5.1 Alternative locations within the Tees estuary

STDC considered a number of locations within the Tees estuary for the proposed facility prior to selecting the South Bank site as the preferred option. The options which were originally considered comprised the existing Redcar Bulk Terminal (RBT), the currently undeveloped Bran Sands site and the disused South Bank site.

A feasibility study identified that the environmental impacts associated with each of the three possible options were largely the same, and therefore the decision regarding which site to progress was predominantly driven by technical and commercial decisions.

5.2 Alternative dredging plant

There is likely to be a requirement to utilise a number of different types of dredger depending on the nature of the material being dredged. Therefore, for different parts of the dredging it will be necessary to use a TSHD or backhoe. The environmental implications of using these dredgers have been assessed and no other alternatives exist that could undertake the work.

5.3 Alternative dredge depths

The proposed dredged depth in the navigation channel has been chosen to maximise the tidal window to which the quay and channels are accessible for vessels of particular drafts. The proposed depth of the berthing pocket is required to enable berthing of vessels at the quayside throughout the tidal cycle. The width of the proposed berth pocket has been set by the widest vessel which is anticipated to use the facility. There are no real alternatives to the proposed design depths and widths as these are inherent to the proposed scheme design.

5.4 Alternative phasing

Phasing of the development (specifically phasing of the construction of the quay wall) has not yet been defined and will be subject to the capital cost of the first phase of the development, taken together with the customer demand and the utilisation of the existing facilities. Options with respect to phasing include differing lengths for an initial phase of the development with the completion of the remaining length during a subsequent phase (or number of phases). For the purposes of the assessment, it has been assumed that the scheme would be constructed in phases, with an initial berth length of 450m, being subsequently extended as required up to the full 1,050m.

5.5 Alternative positions along the river axis

The South Bank site is bounded at the upstream end by a large electricity pylon with overhead power lines, and a set of pipe tunnels which cross underneath the River Tees at the downstream end. These constraints severely limit the alternative positions for the proposed quay along the river axis.

6 ASSESSMENT METHODOLOGY

The characteristics of the existing (baseline) environment were defined, and the potential environmental impacts of the proposed scheme identified and assessed, through the following methods and activities:

- Desk based reviews, interpretation and assessment of existing data.
- Site surveys.
- Consultation.

The EIA Report reports the findings of the EIA process. The following environmental parameters / topics were considered in detail within this process:

- Hydrodynamic and sedimentary regime.
- Marine sediment and water quality.
- Land quality.
- Marine ecology.
- Marine mammals.
- Terrestrial ecology.
- Marine and coastal ornithology.
- Fish and fisheries.
- Commercial and recreational navigation.
- Traffic and transport.
- Archaeology and cultural heritage.
- Noise and vibration.
- Air quality.
- Landscape and visual.

- Flood risk and coastal defence.
- Socio-economics.
- Climate change.
- Use of natural resources.
- Disaster risk.
- Health risk assessment.
- Offshore disposal of dredged material.

Where potential adverse impacts have been identified, mitigation measures have been recommended to reduce or avoid potential impacts to acceptable levels

7 SUMMARY OF PREDICTED ENVIRONMENTAL IMPACTS

7.1 Hydrodynamic and sedimentary regime

The assessment of potential effects on the hydrodynamic and sedimentary regime has been undertaken using a combination of: (i) a review of existing information; (ii) field data collection; (iii) numerical modelling techniques; and (iv) expert geomorphological assessment.

During construction, the demolition of the wharf and jetties will have only minor, localised and temporary effects that are not of significant concern. Construction of the new quay (to be set back from the riverbank) will be from land, using predominantly land-based plant, with no construction activity in the river and so will cause no effects on the hydrodynamic and sedimentary regime.

The capital dredging of the river and the offshore disposal of dredged sediments both will cause plumes of sediment to form. The plume effects arising from the river dredging are characterised by a short-lived localised increase in suspended sediment concentrations by the order of a few hundred mg/l at the point of dredging activity, followed by a general dispersion in spatial extent and reduction in concentration over following hours. Since the dredging is a near-continuous operation, the plume effects will be observed throughout much of the approximately four-month period, but at varying extents depending on the dredging activities undertaken at any one time.

The plume effects arising from the offshore disposal similarly show peak concentrations at the point of release, but because a larger volume of material is near-instantaneously disposed, the peak concentrations are typically a few thousand mg/l at the point of disposal activity. Plumes become advected from the offshore disposal site by tidal currents along the principal axis of tidal flow (north-west to south-east), diminishing in magnitude over a few hours after disposal. Deposition thicknesses of sediment from the plumes on the river or seabed will be very small.

During operation of the new quay, the quay alignment and capital dredging of the river will not significantly affect the existing baseline hydrodynamic conditions, although there will be flow occurring in the area of the new quay because it is being set-back from the existing riverbank, but even the peak flows in this area will be low. Elsewhere, there will be a general small magnitude reduction in baseline flows, the magnitude and location of which will vary during different phases of the tidal cycle, but always remaining largely within the reach immediately opposite the new quay. This reduction in baseline flows is caused by both a slight widening of the channel (due to the new quay alignment) and the local deepening of the bed due to the capital dredging. There are no predicted changes in water level or wave conditions near the site or in the wider estuary, other than locally in the area of newly set-back quay.

There will be a direct 'footprint' loss of 25,000m² of intertidal area, impact upon 325,000 m² of existing subtidal area and creation of 55,000m² of new subtidal area. However, the change in the overall tidal prism of the estuary will be minor (0.8% increase) and is not deemed to be a cause of significant estuary-wide change in hydrodynamics.

The modelled reductions in current speeds within the reach of the channel local to the proposed new quay, combined with the creation of a new berth pocket at the quay, may lead to a small increase in sediment deposition rates and hence a requirement for more sediment to be dredged annually from this local reach. However, even under this scenario, the maintenance dredging from the reach local to the new quay will make a very low overall contribution to the net annual maintenance dredging requirements from the estuary as a whole. Therefore the potential increase in maintenance dredging requirement is not expected to be significant and could easily be managed within existing maintenance dredging and offshore disposal regimes.

There is no predicted effect on the baseline sediment transport regime and seabed or shore morphology across the wider study area of the Tees estuary or Tees Bay.

7.2 Marine sediment and water quality

The assessment of potential impacts associated with marine sediment and water quality has been undertaken with reference to publicly available sediment and water quality data. A site-specific sediment quality survey is proposed and the results will be provided to the MMO once available. As results from that survey were not available at the time of writing, it has been assumed that the sediment quality within the proposed scheme footprint would be similar in nature to that found during the 2019 survey for the Northern Gateway Container Terminal (NGCT).

A potential impact on water quality has been identified due to the resuspension of sediment, principally as a result of the proposed dredge. However, on further consideration of the potential impact, the risk of exceeding water quality standards was deemed to be low. Additionally, sediment plume modelling shows relatively limited areas of high suspended solids concentrations, which only occur for a matter of hours at a time before the suspended sediment concentrations return to baseline values. No significant impacts are therefore predicted.

Other impacts such as demolition and removal of existing structures and construction of the new quay wall would have small and localised effects on water quality, but the effects of this would be highly localised and temporary only. Landside material within the riverbank (to be excavated to create the new berth pocket) would be characterised and (if necessary) remediated before any works commence.

Best practice measures would be adopted during the dredging process to minimise the potential for resuspension of sediments. Such measures include dredging in long strips to ensure the plume is located only on one side of the channel at a time and using experienced operators. Best practice measures when working in and around water would also be adopted and captured in a Construction Environmental Management Plan (CEMP) to ensure impacts on the Tees estuary are minimised as far as possible.

7.3 Land quality

A desk-based assessment of available information indicates that there is the potential for contamination to be present in soils and groundwater within the landward parts of the proposed scheme footprint. This contamination is likely to originate from historical industrial land uses both within the footprint of the proposed scheme boundary and on neighbouring land. Construction activities will disturb soils and groundwater and

may result in the mobilisation of contaminants which have the potential to impact on controlled waters and human health receptors.

It is concluded that the impact during the construction phase of the proposed scheme would be of negligible significance to groundwater, moderate adverse to the Tees estuary and associated ecological receptors and minor adverse significance to human health. This is on the basis that the embedded mitigation measures set out in a CEMP would be adhered to, and the measures detailed in an outline remediation strategy would be implemented.

A programme of site characterisation is proposed in advance of the construction phase commencing to ascertain whether contaminants are present in concentrations that could result in harm to human health or controlled waters. Should unacceptable risks be identified, remediation works will be undertaken in addition to the works outlined in the remediation strategy. With implementation of mitigation measures, the residual impacts are of minor adverse significance at worst.

During operation, site remediation works will have taken place. As a result, the impacts during operation are minor beneficial to controlled waters and negligible to human health.

7.4 Marine ecology

The assessment of potential impacts to marine ecological receptors has been undertaken with reference to publicly available benthic ecology survey data and site-specific observations. A site-specific benthic ecological survey is proposed to be undertaken during 2020 and the results will be provided to the MMO once the survey and analysis is complete. As results from that survey were not available at the time of writing, it has been assumed that the benthic communities within the proposed scheme footprint would be similar in nature to those found during the 2019 survey for the NGCT. This is considered a reasonable assumption given proximity, nature of the subtidal substratum present within the footprint of the proposed scheme and the apparent similarity in the nature of the intertidal communities present at the location of the proposed and the NGCT footprint based on the intertidal walkover survey.

Predicted construction phase impacts are linked to habitat loss from the demolition of existing structures and capital dredging, increased suspended sediment concentrations and increased sediment deposition.

Based on the sensitivity of the benthic communities and habitats expected to be present within the proposed scheme footprint and the results of the hydrodynamic and sediment plume modelling, an impact of minor adverse significance is predicted with regard to habitat loss. No significant impacts are predicted to marine ecological receptors as a result of increased suspended sediment concentrations or sediment deposition during construction.

Predicted operational phase impacts include the creation of new subtidal habitat within the proposed berth pocket, impacts to marine ecological receptors due to a change in the flow regime and impacts associated with maintenance dredging. All operational phase impacts are predicted to be of negligible significance, with the exception of the subtidal habitat creation within the proposed berth pocket; this is predicted to result in a minor beneficial impact.

7.5 Marine mammals

A desk-based review of available literature indicates that the marine mammal species most likely to occur in the vicinity of the proposed scheme are harbour seal. However, there is also potential for harbour porpoise, minke whale and grey seal in the wider area, including at the Tees Bay C offshore disposal site.

Based on the outcome of underwater noise assessment, the potential impact of permanent auditory injury to marine mammals from dredging has been assessed as negligible. The assessment has concluded impacts of negligible significance to all marine mammals with regard to potential for temporary auditory injury from all other activities.

As piling is to take place on land and out of water, underwater noise levels will be below those that could potentially cause temporary threshold shift (short-term adverse effects on hearing) of seals, even under worst case conditions.

Although there will be a small temporary increase in construction-related vessel traffic during dredging and construction, vessel strikes are not anticipated to be significant due to the existing number of vessel movements in the area. A worst-case impact of negligible significance (not significant) is predicted.

The haul out site at Seal Sands is not anticipated to be affected by the proposed scheme due to its distance from the proposed scheme footprint background vessel traffic movements. Prey resources are also not anticipated to be significantly affected by the proposed scheme, with a worst-case impact of minor adverse predicted.

7.6 Terrestrial ecology

An ecological field survey was undertaken in 2019 and 2020 which confirmed that the habitats within the proposed scheme footprint were of limited ecological value for brown hare, hedgehog, breeding birds, invertebrates, foraging bats and commuting otters.

The proposed scheme will result in the permanent loss of a small area of broadleaved woodland; however, the trees within this area are predominately young birch trees and therefore have been assessed as having low ecological value. Invasive non-native species (namely Japanese Rose and Japanese Knotweed) were also recorded within the footprint of the proposed scheme. No other species or habitats of importance were recorded.

The proposed scheme would result in the following environmental impacts to terrestrial ecological receptors:

- disturbance on foraging and commuting bats;
- disturbance (lighting and noise) on commuting/foraging otters;
- disturbance and loss of habitat for breeding birds;
- loss of foraging and breeding habitat for terrestrial invertebrates;
- potential spread of invasive non-native species; and
- disturbance and habitat loss for brown hare and hedgehogs.

Best practice measures would be adopted during construction and operation to minimise adverse impacts to all species. In addition, lighting requirements will be designed in accordance with the industry guidance to reduce impacts to bats and otters. Where possible, vegetation will be removed during winter months whilst birds are not nesting, and an Invasive Species Management Plan will be prepared to ensure the control of spread of non-native plant material. Following the mitigation outlined above, a worst-case impact of minor adverse is predicted for the identified terrestrial ecology receptors.

7.7 Marine and coastal ornithology

The proposed scheme is located within the Teesmouth and Cleveland Coast Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI), and is adjacent to the Teesmouth and Cleveland Coast Ramsar site. The Tees estuary provides supporting habitat for wintering waterbirds and breeding terns. The

understanding of the existing environment within the study area has been informed by a desk-based review of existing data plus ongoing site-specific surveys for both estuarine waterbird species and terns. The existing information indicates that the North Tees Mudflat hosts foraging waterbirds at low tide, and the river channel itself is used by foraging common terns.

Direct impacts on supporting habitat would only affect areas of relatively low value for foraging waterbirds and terns, notably the depauperate intertidal area and the artificial structures at the South Bank. The footprint of the proposed scheme does not overlap with high value habitat such as intertidal mudflats at North Tees Mudflat, Vopak Foreshore or other such areas further downstream. As a result, impacts on foraging / roosting waterbirds as a result of changes to supporting habitat are expected to be minor adverse.

It is predicted that there would be no effects on benthic prey resources at mudflats and other intertidal areas. Impacts on fish resources within the subtidal area, as a result of increased suspended sediment, would only affect a minute portion of the common tern foraging range and would be temporary and short-lived. As such, impacts on prey resources and foraging are predicted to be minor adverse, at worst.

Some noise and visual disturbance is expected during construction particularly as a result of the proposed piling works. Following the implementation of mitigation measures, including shrouding on the piling rigs, noise levels at the North Tees Mudflat, Vopak Foreshore and other high-value supporting habitats within the Tees will fall below significant sensitivity thresholds. With mitigation in place, disturbance impacts are predicted to be minor adverse, at worst.

During the operational phase, hydrodynamic modelling suggests that there will be no measurable change to water levels in the estuary and therefore no significant impacts on mudflat exposure time. The increase in vessel traffic is expected to be insignificant in the context of existing traffic, and operational activities are in keeping with other activities in the area. Therefore, significant disturbance effects are not predicted.

7.8 Fish and fisheries

The Tees estuary provides both intertidal and subtidal habitat for a number of resident fish and shellfish species, with plaice, cod, dab, whiting and flounder being the principal species recovered during fish surveys. Migratory fish species regular commute along the Tees, notably salmonids, lampreys and European eel. Most commercial fisheries operate outside of the Tees, but there are small, seasonal fisheries that target lobster and velvet swimming crab.

Adverse impacts may be expected as a result of temporary increases in SSC during the capital dredging works, notably if creating barrier effects that may deter migratory patterns. However, with mitigation measures in place to reduce the magnitude of such effects, any residual impact is predicted to be minor. Other water quality issues, such as a reduction in dissolved oxygen or suspension of contaminants, are not considered to have any significant impact on resident or migratory species.

Alteration of subtidal habitat due to the proposed dredge is expected to be temporary and would be similar to that already experienced through regular maintenance dredging that is already undertaken within the Tees, and is therefore expected to have a negligible effect on fish. The removal of the existing wharf structure has potential to remove sheltering habitat for juvenile fish, however the implementation of mitigation measures such as creation of new complex habitat within the proposed quay walls via proposed 'verti-pools' means that the net loss would only result in a minor adverse effect on juvenile fish.

Based on the expected underwater noise levels associated with capital dredging activities, sound thresholds for causing physical injury will not be exceeded. In terms of behavioural responses, it is expected that fish will already be habituated to regular dredging noises within the estuary and a minor adverse impact is

predicted. A review of potential impacts from land-based piling resulted in a conclusion that there will be negligible impacts on both resident and migratory fish. Disturbance during the operational phase, either as a result of vessel calls to the new quay or the use of quayside lighting, is predicted to have a negligible effect.

Given that there is very little fishing within the affected area, there is unlikely to be any significant impact on fishing activity as a result of the proposed scheme. As the channel is dredged on an almost daily basis, the area within the footprint of the scheme is unsuitable for placement of fishing pots targeting crabs or lobster. As a matter of course, any conflicts will be resolved through coordination via the harbour. Bait digging takes place on intertidal mud and sandflats within the Tees estuary, but the area of intertidal that will be lost during the construction of the proposed scheme is small and has restricted public access.

7.9 Commercial and recreational navigation

Many of the riverside industrial plants along the 17km stretch of the River Tees have docking and cargo facilities and, therefore, the River Tees experiences significant commercial vessel traffic. PD Teesport (PDT) has confirmed that on average, there are between 800 and 950 vessel movements per month within the Tees estuary.

The only potential impact which could arise during the construction phase is a conflict between construction vessels and ongoing commercial navigation within the estuary. It is envisaged that PDT would manage any potential conflicts in the same way as routine dredging and other construction activities, through coordination between STDC, the appointed Contractor and the Harbour Master. Management of dredging operations within a busy port environment is a standard activity for the Harbour Master.

The use of a Vessel Traffic System (VTS) would provide a satisfactory mechanism for the effective management of all shipping traffic within the Tees estuary and Tees Bay. STDC would liaise with the Harbour Master to ensure that Notices to Mariners are issued at the appropriate times to inform other users of the proposed construction works. In addition, construction vessels would use appropriate signals as required by International Regulations to allow safe navigation. An impact of negligible significance on commercial navigation is predicted during the construction phase.

The proposed scheme will result in more frequent movements of larger vessels within the Tees estuary compared with the existing situation. This has potential to impact on navigational safety within the estuary. A navigation risk assessment has been undertaken to determine the significance of potential operational phase impacts; the risk assessment has concluded that operational phase hazards would be 'As Low As Reasonably Practicable', and are therefore, acceptable in terms of risk with the proposed scheme determined to have minimal effect on the existing navigation profile. An impact of negligible significance is predicted during operation.

7.10 Traffic and transport

The traffic and transport assessment has been supported by a detailed Transport Statement (TS). The TS includes details of the existing highway environment and the proposed schemes forecast traffic demand and assignment via the highway network. An assessment of the proposed increases in traffic when compared to background traffic flows has been undertaken and (in accordance with the Guidelines for the Environmental Assessment of Road Traffic), the impact is considered to be negligible significance.

7.11 Archaeology and cultural heritage

The historic landscape/seascape character of the South Bank area is one of 19th and 20th century industrial heritage, and, industry still defines and dominates the region today. Elements of the proposed scheme (dredging and construction of the new quay) are in keeping with the historic (and current) character of the study area. Both the historic landscape and seascape character of the study area have capacity to accommodate this change in line with the ongoing industrial uses of the wider locality. Similarly, there will be no impact upon the significance of heritage assets as a result of changes to their setting.

There are no designated heritage assets, nor any extant, non-designated heritage assets recorded within the proposed scheme footprint. However, the dilapidated remains of the early 20th century South Bank Wharf and three jetties will be demolished as part of the proposed scheme and it is recommended that a suitable record of the structures be prepared prior to demolition, anticipated to comprise a photographic record / drone footage of the wharf and jetties. The suitability of this record will be confirmed in advance of demolition being undertaken with RCBC and submitted to the RCBC Historic Environment Record (HER). The live electrical substation, conveyor and pipework (associated with the pumping station) which are to be demolished as part of the proposed scheme are not considered to be of heritage value in themselves and no mitigation is proposed prior to the removal of these elements.

The potential for buried archaeology to be present within reclaimed areas is limited to the potential for in situ prehistoric deposits which may survive beneath the reclamation deposits and beneath the currently maintained depths within the channel. Given this potential, geoarchaeological assessment of vibrocores/boreholes, planned as part of a marine ground investigation, will be undertaken in advance of work commencing.

The potential for the survival of in situ archaeological material within the river channel, associated with the recorded losses of wrecks and aircraft for example, has been significantly reduced by disturbance from previous dredging. Archaeological material may still survive, albeit fragmentary and dispersed, or potential preserved within intertidal areas along the riverbank, as suggested by the record of a seaplane close to the existing dilapidated South Bank Wharf. Although the reported position of this seaplane is unreliable, and the position, nature and extent of this previously reported seaplane are unclear, remains may be present, possibly buried or fragmented, and potentially within the proposed scheme footprint.

It is proposed that an archaeological reporting protocol is adopted to mitigate the potential impact on any as yet unidentified marine archaeological remains arising from construction activities. It is proposed that this protocol would be formalised in a Written Scheme of Investigation (WSI) which would be produced by a suitably qualified marine archaeological specialist.

Indirect impacts to heritage assets from changes to the hydrodynamic and sedimentary regime are also assessed and significant effects are not anticipated to occur.

7.12 Noise and vibration

The assessment of potential noise impacts has been informed by baseline noise monitoring and computer modelling. Consultation with RCBC confirmed that vibration could be scoped out of the assessment due to the separation distance between the proposed scheme footprint and sensitive receptors. Potential operational phase noise disturbance impacts to noise sensitive receptors were not considered as part of the assessment through agreement with RCBC.

The assessment of potential noise impacts has focussed on construction phase road traffic and use of construction phase plant and machinery. Given the separation distance between the proposed scheme

footprint and residential properties, it was agreed with RCBC that the assessment would focus on commercial receptors at the South Tees Business Parks. The outputs from computer modelling predict that construction phase noise levels at the South Tees Business Parks would be negligible. No mitigation measures are required.

7.13 Air quality

Impacts on human and ecological receptors were considered as a result of air emissions generated during the construction and operational phases of the proposed scheme. Qualitative assessments were undertaken to consider the impacts of construction phase dust emissions and construction and operational phase road traffic, plant and vessel emissions.

Mitigation and control measures are recommended to minimise the effects of dust and plant emissions during construction. Impacts of road traffic emissions were considered to be insignificant due to the low level of generated traffic. Impacts of vessel emissions were considered in relation to the low number of vessels generated by the proposed scheme and the relatively short duration of use and were considered to be insignificant. Onsite plant emissions were also considered and, as the proposed scheme is located at a distance from human receptors and habitats sensitive to air pollution, impacts of plant emissions were considered to be not significant.

7.14 Landscape and visual

The proposed scheme is located in an extensive industrial area. Existing landscape character and views are strongly influenced by large industrial buildings, dockside cranes, chimney stacks, silos and associated infrastructure including busy road and rail corridors and very tall electricity pylons. The proposed scheme also lies within a wider area of future economic regeneration, to be delivered through the South Tees Regeneration Programme. As a result, the existing industrial character of the site and its surroundings is predicted to be further reinforced by future, large scale industrial development.

The landscape and visual impact assessment (LVIA) establishes that operational effects of the proposed quay and other associated ground level features, will not incur significant effects. Potential landscape and visual effects will be derived from the operational use of very tall heavy lift cranes and the storage and assemblage of tall wind farm components. Tall features may be seen rising above local visual horizons, or may be visible from elevated vantage points within the study area.

Given the existing, strongly industrial character within the study area and the effects that industrial and urban features have on existing views, the LVIA concludes that the proposed scheme will not result in significant, adverse landscape or visual effects. There will be no views to ground level, quayside activity. Where proposed tall structures are visible in close range views, they will be seen in context of other, tall industrial features. In more distant or elevated views, proposed tall structures may be seen in the skyline but the overall change in both views and the character of the landscape, will not be significant.

7.15 Flood risk and coastal defence

Given the location of the proposed scheme, there is the potential for impact on coastal / tidal defences and flood risk during the construction and operational phase. The assessment of flood risk and the coastal / tidal defence has been informed through a combination of desk-based assessment, hydrodynamic modelling studies and a site-specific Flood Risk Assessment (FRA) carried out in accordance with national policy.

The FRA includes details of the existing flood risk from all sources of flooding, future flood risk as a result of climate change and the impact that the proposed scheme may have on flood risk both now and in the future. The primary sources of flooding that may affect the proposed scheme have been identified as tidal flooding from the Tees estuary or localised surface water flooding to the area of land required for the proposed quay.

The existing riverbank comprises a tidal defence, providing protection during a tidal event within the Tees estuary. As part of the proposed scheme, a new quay wall is proposed in a set-back position into the existing riverbank providing a revised defence line and continued protection during an extreme event, both now and in the future.

As part of the proposed scheme the quay would be constructed such that surface water would drain into the underlying material without the need for a formal drainage system across the majority of its length. A drainage system collecting surface runoff through gullies would be required for the proposed heavy lift areas which are to be surfaced with concrete. The collected water will be discharged into the Tees estuary through the quay wall, via an interceptor.

As such the potential impacts of flooding to and from the proposed scheme have been mitigated within the design and therefore no impact is predicted during either the construction or operational phase.

7.16 Socio-economics

A desk based socio-economic assessment has been undertaken to inform the assessment of potential impacts. The desk-based assessment involved a review of nationally published data from the Office for National Statistics, as well as local authority statistics and other data including the 2011 Census, Experian datasets and other publicly available national statistics. The study area comprises the local authorities of Redcar and Cleveland, Middlesbrough and Stockton-on-Tees.

The assessment concludes that the proposed scheme will have a temporary, short-term and minor beneficial impact on the local economy by creating new construction (and supply chain) jobs and a temporary, short-term and minor beneficial effect in relation to economic output (as measured by Gross Value Added) during the construction period. No mitigation measures during the construction phase are required.

The operation of the proposed scheme is intended to facilitate the operation of the South Industrial Zone warehousing/distribution ('landside') development proposal which itself is likely to bring about a significant uplift in employment opportunities locally. However, the scale of employment (and related economic output) generated by the proposed scheme is likely to be small. As such, the anticipated operational impacts are assessed as being permanent and negligible. No mitigation measures during the operational phase are required.

7.17 Climate change

Greenhouse gases would be released during the construction and operational phase of the proposed scheme (from machinery and plant required to construct and operate the proposed scheme). In the context of existing emissions generated across the region, these emissions are not predicted to be significant.

7.18 Use of natural resources

The proposed scheme will require the use of natural resources during construction and operation (i.e. water for drinking/WC use). However, this is not considered to be significant or unusual for a project of this nature and no significant natural resource demands are anticipated.

7.19 Disaster risk

There is a series of pipe tunnels that cross under the Tees estuary in the vicinity of the proposed scheme. However, the proposed scheme has been designed to ensure that works are not required above the pipe tunnels and therefore no disaster risk (e.g. due to destabilising) associated with the pipe tunnels is envisaged.

In addition, an electricity pylon is located at the upstream of the proposed scheme footprint, with electricity cables passing over the river channel. Potential impacts to such infrastructure which could lead to disaster risks from a health and safety perspective, have been designed out of the scheme by locating the proposed quay downstream of such infrastructure.

7.20 Health risk assessment

The assessment of impact to human health has been undertaken using the findings of the air quality, noise and vibration and land quality assessments. Impacts to human receptors due to land quality, noise disturbance and reductions in air quality are considered to be negligible during construction and operation. It is therefore concluded that impacts to human health would be of negligible significance.

7.21 Offshore disposal of dredged material

It is proposed that all dredged material would be disposed of offshore at the Tees Bay C offshore disposal site. An assessment has been undertaken to determine the potential impacts as a result of such disposal. Based on the findings of hydrodynamic and sedimentary plume modelling, the disposal of dredged material is predicted to have a negligible impact on fisheries, marine ecology and marine mammals, and no impact on navigation.

8 CUMULATIVE IMPACT ASSESSMENT

The EIA Regulations require that an assessment is made of the potential for cumulative effects to arise. This should consider the impacts of the proposed scheme with other past, present and reasonably foreseeable (proposed) projects and was undertaken in this case.

There are a number of other plans and projects within the Tees estuary and along its banks which could result in cumulative impacts with the proposed scheme, should they be undertaken at the same time as the proposed scheme. A worst-case cumulative impact of minor adverse significance is predicted.

9 WATER FRAMEWORK DIRECTIVE COMPLIANCE ASSESSMENT

A Water Framework Directive (WFD) compliance assessment has been undertaken for the proposed scheme. The scoping stage of the assessment identified a number of WFD compliance parameters for the Tees coastal water body that could be at risk from the proposed activities, which were subject to further assessment.

Further detailed assessment of these activities was undertaken and determined that the above aspects would not cause deterioration in water body status, potential problems with respect to the ability of the water body to meet its objectives in the future or compromise the mitigation measures in place for the water body.

10 HABITATS REGULATIONS ASSESSMENT

An assessment of the potential for the proposed scheme to affect sites designated under European nature conservation legislation has been undertaken. The assessment concluded that the proposed scheme would

result in a likely significant effect on the Teesmouth and Cleveland Coast SPA and Ramsar site. However, the effects and impacts of the proposed scheme are considered to be of sufficiently low magnitude and can be mitigated such that an adverse effect on the integrity of the SPA and Ramsar site would not occur (either alone or in-combination with other plans and projects).