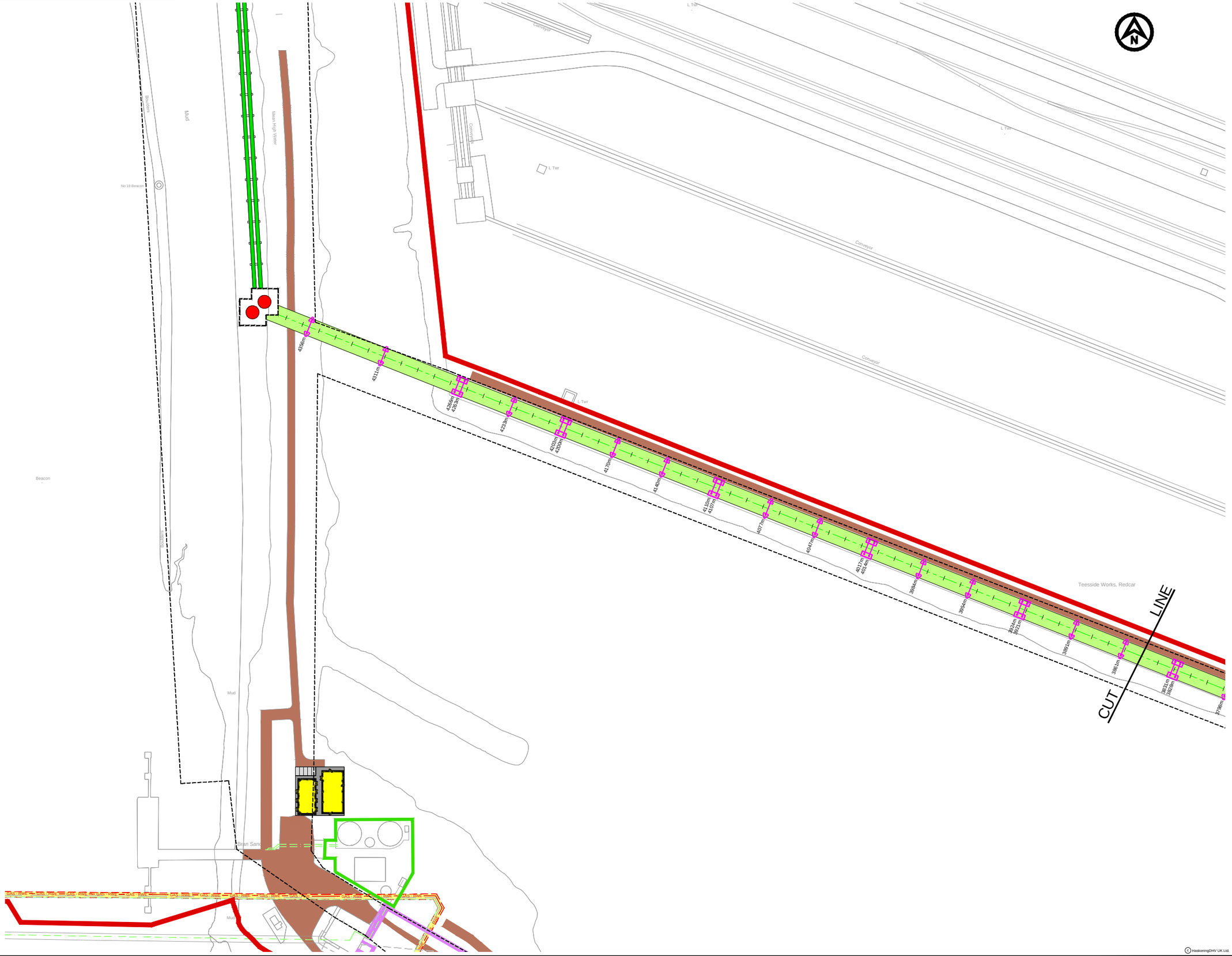
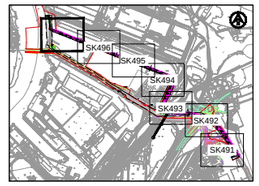
DRG No. PB1586-SK497



NOTES

MAJOR CROSSINGS

MC 0 : Eastern Boundary Road	- Pass over in bridge
MC 1 : Highway A1085	- Pass over in bridge
MC 2 : YPL 1st access road	- Pass over in bridge
MC 3 : Hot metal rail	- Pass over in bridge
MC 4 : NWL 2nd access road	- Pass over in bridge
MC 5 : National power grid lines	- Pass under 10 m clearance
MC 6 : SSI road bridge	- Pass over in bridge
MC 7 : National rail way	- Pass over in bridge
MC 8 : Access NWL W.T.P.	- Pass over in bridge
MC 9 : Outfall	- Pass over in bridge



KEY PLAN
SCALE 1:50000

LEGEND - CONVEYOR

- TYPE 3 - OPEN CONVEYOR - 2 LEGS
- TYPE 4 - OVAL ENCLOSED CONVEYOR - 2 LEGS
- TRANSFER TOWER
- ACCESS ROUTES
- CONVEYOR FOOTINGS
- CONVEYOR AT THE QUAY

LEGEND - EXISTING SERVICES

- EASEMENT ZONES
- GAS - BP CATS
- GAS - GDF SUEZ
- GAS - RWE
- FIBRE OPTIC CABLE
- MISC - DRAINS, CABLES, DUCTS
- FOUL WATER - SEMBCORP
- WATER - NWL
- GAS - ABANDONED
- ABOVEGROUND PIPELINE CORRIDOR
- OVERHEAD POWER CABLES
- CONVEYOR LATERAL LIMITS OF DEVIATION

REV	DATE	DESCRIPTION	BY	CHK	APP
E	18.03.15	PLANNING ISSUE	LW	DGB	MH
D	16.03.15	MINOR REVISIONS	CH	DGB	MH
C	11.03.15	MINOR REVISIONS	LW	DGB	MH
B	05.03.15	ISSUED FOR APPROVAL	TF	DGB	MH
A	27-02-15	FIRST ISSUE	LW	DGB	RWP

REVISIONS

YORKPOTASH
A Sirius Minerals Project

PROJECT
YORK POTASH

TITLE
THE YORK POTASH
HARBOUR FACILITIES ORDER 201X
CONVEYOR ROUTE PLANS
NORTHERN ROUTE - SHEET 7
REGULATION 5(2)(o) DOCUMENT 3.3O

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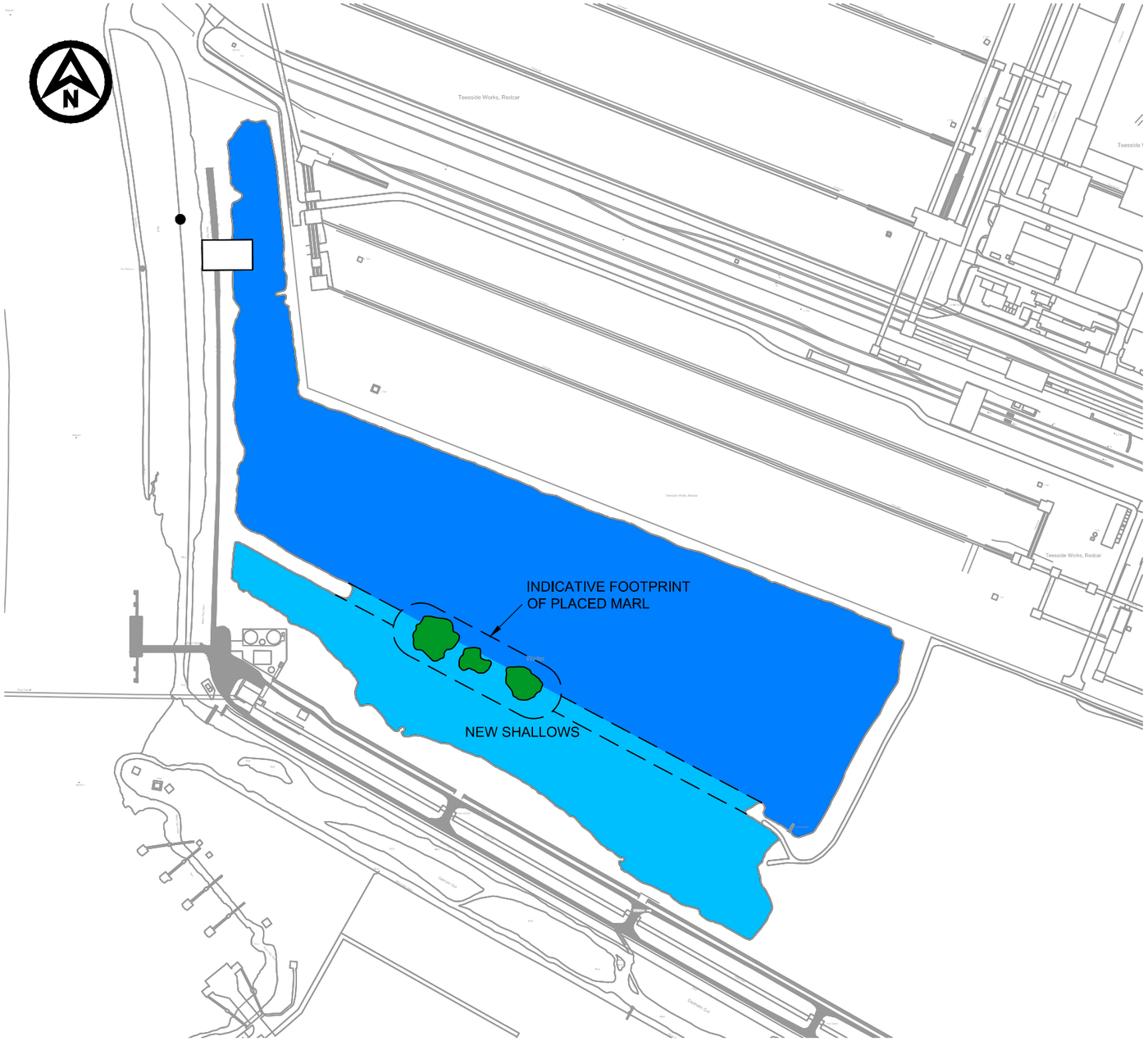
DRAWN	LW	CHECKED DGB	PASSED RWP
DATE	FEB'15	CLIENT'S REF.	
SCALE AT A1	1:1000	AUTOCAD REF.	PB1586-SK497

DRAWING No. PB1586-SK497
REVISION E

DRG No. PB1586-SK467



KEY

- PROPOSED NEW SHALLOWS
- OPEN WATER OF THE LAGOON
- PROPOSED ISLANDS

NOTES

1. THE TOP SURFACE AREA OF THE ISLANDS IS APPROXIMATELY 3,500m².
2. MAX HEIGHT OF ISLANDS TO BE +4.00mOD.
3. APPROXIMATE AREA OF NEW SHALLOWS IS 5.40ha.
4. THIS DRAWING IS ONLY INTENDED TO BE ILLUSTRATIVE OF THE FINAL SCHEME. SIZES AND POSITIONS OF THE VARIOUS ELEMENTS ARE SUBJECT TO FURTHER REVISION.
5. THIS DRAWING HAS BEEN PRODUCED TO ILLUSTRATE ONE POSSIBLE METHOD OF DELIVERING THE PROPOSED ENVIRONMENTAL ENHANCEMENTS TO THE BRAN SANDS LAGOON. HOWEVER, THE AREA AND HEIGHT PARAMETERS STATED WILL APPLY REGARDLESS OF HOW THE PROPOSALS ARE IMPLEMENTED.

REV	DATE	DESCRIPTION	BY	CHK	APP
A	12.03.15	ISSUED FOR APPROVAL	CH	MS	RWP

REVISIONS

YORKPOTASH
A Sirius Minerals Project

PROJECT

YORK POTASH

TITLE

BRAN SANDS LAGOON
PROPOSED HABITAT
ENCHANCEMENT

Royal HaskoningDHV
Enhancing Society Together

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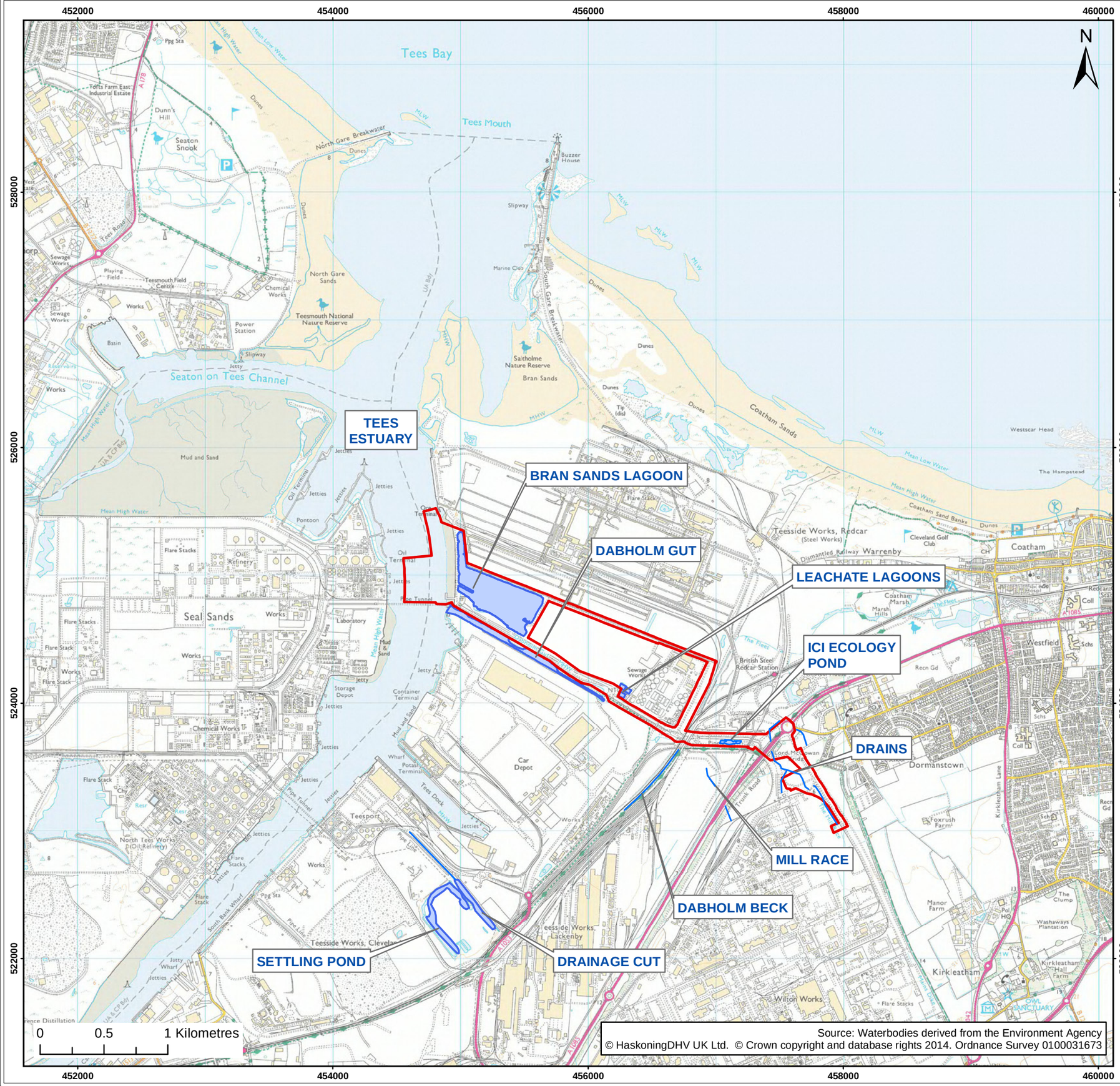
DRAWN	CH	CHECKED	MS
PASSED	RWP		
DATE	MAR '15	CLIENT'S REF.	
SCALE AT A3	1:5000	AUTOCAD REF.	PB1586-SK467

DRAWING No. PB1586-SK467

REVISION A



Legend:

- DCO Order Limits
- Surface Water Features

DCO Order Limits as of 24/02/15

Client:	Project:
York Potash Limited	York Potash Project Harbour Facilities

Title: Surface Water Features near Harbour Facilities

Part:	Figure:	Drawing No:
HF	1.1	9Y0989-HF-6-001

Rev:	Date:	Drawn:	Checked:	Size:	Scale:
1	06/03/2015	GC	SR	A3	1:30,000
0	09/12/2014	GC	SR	A3	1:30,000

Co-ordinate system: British National Grid

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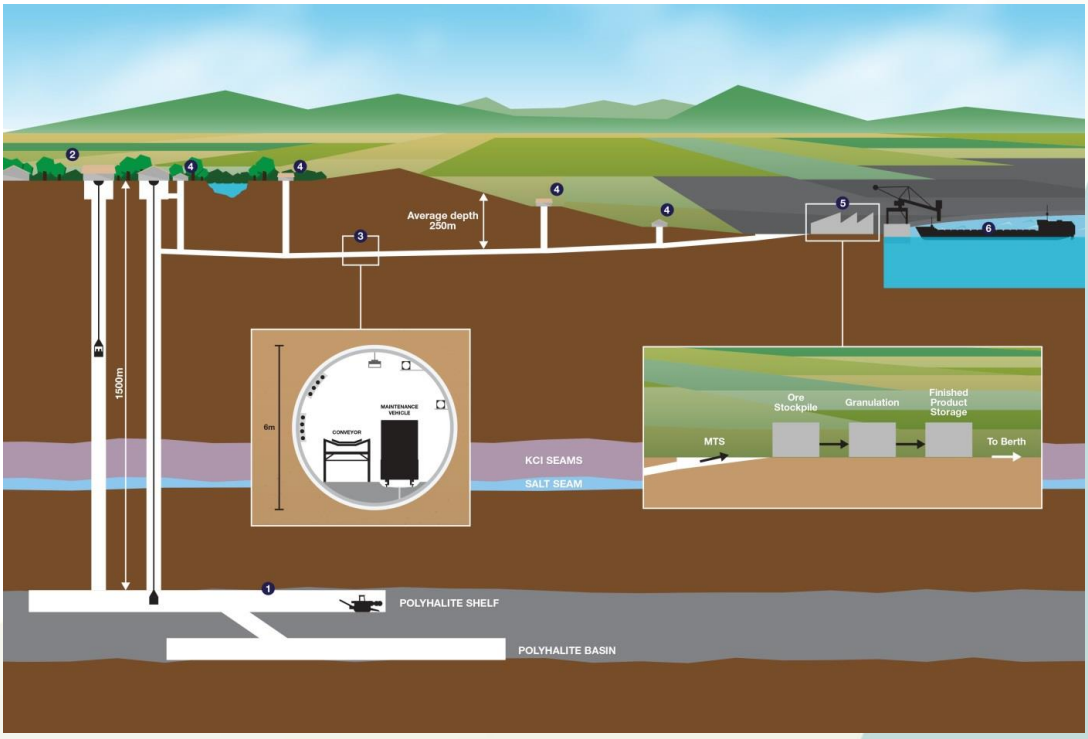
- The MTS would extend approximately 36.7km from Doves Nest Farm (where the MTS access shaft would be located) to the MHF at Wilton. The MTS would include three intermediate shafts installed along its route, located approximately 8km, 24km and 29.5km from the Mine.
- A straddling application was made in September 2014 to the North York Moors National Park Authority (NYMNPA) and Redcar and Cleveland Borough Council (RCBC) for the Mine and MTS and, in parallel, an application for the MHF was made to RCBC. Applications have been submitted to Scarborough Borough Council (SBC) and the NYMNPA for the Construction Village and P&R facilities and Operational P&R facilities respectively.
- The Harbour facilities would be located adjacent to the Port of Teesside, on the River Tees, and joined to the MHF by conveyors. The proposed volume of product to be handled by the facilities exceeds the threshold set out in the Planning Act 2008 for the export of bulk material from harbour facilities (5mtpa). This means that the proposed Harbour facilities constitute a Nationally Significant Infrastructure Project (NSIP) and require a Development Consent Order (DCO) from the Secretary of State.

1.1.9 A separate ES was prepared from the Mine and MTS, and MHF applications.

Figure 1-2 Overview of the key elements of the YPP



1. Conventional underground mining	4. Maintenance, ventilation and emergency access
2. Mine	5. Granulation and storage at the MHF
3. MTS	6. Harbour facility infrastructure

1.2 Consideration of alternatives

Alternative ports for the terminal

1.2.1 The port at Hull was considered as an alternative to export from a terminal at Bran Sands; however, this would have involved the MTS transporting the product approximately twice the distance from the Mine to the export facility as that required to export from Teesside (with greater associated disruption). The MTS also would have been required to cross the Humber.

1.2.2 The port at Whitby was also considered for the export of product. However, this port is too small to accommodate the facilities required to export the planned volumes of polyhalite product. Whitby port can only accommodate fishing trawlers rather than large shipping vessels required as part of the proposed schemes.

Alternative frontages within the Tees estuary for the terminal

1.2.3 Once the Tees estuary was confirmed as the preferred export location, YPL considered a number of different frontages within the estuary for a port terminal. Other potential locations which were considered comprised the Northern Gateway Container Terminal (NGCT), Queen Elizabeth II Berth (QEII) and No.1 Quay within Tees Dock.

1.2.4 The consented (but not yet constructed) NGCT is a proposed container terminal on the southern bank of the Tees estuary. YPL has determined that the use of containers as a means of export of the product would not be economically sustainable for the proposed export volumes.

1.2.5 No.1 Quay was also discounted as a potential option as PD Ports indicated that it has other aspirations for the quay. The QEII Berth was discounted on technical grounds, as it is not possible to extend the berth to a size which would enable the export of 13mtpa of product.

Alternative designs and layouts for the storage of product at the port terminal

1.2.6 YPL initially considered the use of a conventional storage shed immediately landward of the proposed port terminal to cater for hatch changes and other ship loading interruptions, prior to selecting the use of surge bins for this purpose. The proposed use of surge bins means that there is no requirement for the partial reclamation of Bran Sands lagoon as part of the project, which would have been the case for a storage shed.

Alternative alignments for the conveyor system

1.2.7 A total of ten horizontal alignments for the overland conveyor were considered by YPL prior to selecting the preferred route for the conveyor. A total of four vertical alignment options were considered, namely:

- At grade – the route would be at existing ground level passing under bridges, where possible.
- Elevated above ground level and existing infrastructure.

- Tunnel from Wilton to Bran Sands.

1.2.8 The option of passing the conveyor under the A1085 was also assessed.

1.2.9 The most reliable method of conveying the material to the Harbour facility is a continuous conveyor from the MHF at Wilton. This preference ruled out several of the options under consideration. Of the remaining options, options located at grade (ground level) were rejected on technical grounds, given the high number of existing ground services and support structures already present under existing bridges which would obstruct the route required for the proposed conveyor. This left only one remaining option.

1.2.10 The elevated (but within a subway under the A1085 road) option for the conveyor was rejected for a combination of technical reasons. Progression of this option would require significant lengths of water retaining structure within the subway for flood protection purposes, closure of the A1085 for a significant length of time during construction, diversion of numerous services in the verge of the A1085, diversion of a culvert and closure of an existing access road.

1.2.11 The option of installing the conveyor within a tunnel was rejected as its construction would result in a significant volume of potentially contaminated material arising. There would also be a significant risk of damage to existing buried services, roads and rail services during construction of the tunnel, and there would be a requirement for control of groundwater ingress into it.

1.2.12 The recommended solution was the elevated option (with both a northern and southern conveyor route option within an overall conveyor route envelope). In this option, the impact on buried services and bridges would be minimised.

1.3 Project description

Key parameters of the proposed quay

1.3.1 As the design basis for the port terminal, the maximum vessels proposed are 85,000DWT, with an overall length of 244m. The maximum quay length that could be developed along the Bran Sands frontage is 486m and, therefore, this length has been used as the basis for assessment.

1.3.2 Based on the equipment geometry and allowances for access, the overall quay width would be up to 87m. The level of the quay is set such that significant flooding or overtopping of the deck would not be experienced during the design life of the facility.

1.3.3 Two forms of port terminal have been considered within the EIA, namely an open quay and a solid quay structure. Under the open quay option, the quay and access bridge would be suspended deck structures. Access to the open quay would be via approach bridge platforms. Under the solid quay option, the quay structure would be a combi-pile wall comprised of a line of steel tubular king piles linked by pairs of steel sheet piles. Access to the solid quay would be from the reclaimed area behind

the quay wall. It is proposed that the quay would be constructed over two phases (Phase 1 and Phase 2), to accommodate the phased increase in the production of polyhalite from the Mine.

Dredging of the approach channel and berth pocket

1.3.4 The proposed scheme requires capital dredging of the berth pocket (and approaches to the pocket) in order to allow the maximum design vessels access to the port terminal. This dredging would be undertaken in two phases and is linked to the phased construction of the quay.

1.3.5 The total volume of material to be dredged for the open quay option is estimated at up to 1,122,000m^3. For the solid quay option, there is no requirement to create a stable slope and the dredge volume to create the berth pocket and deepen the approach channel would be up to 814,000m^3.

1.3.6 For Phases 1 and 2, dredging of the silts would be undertaken using enclosed grabs due to elevated concentrations of contaminants within the sediment. Capital dredging of the sands and gravels is likely to be undertaken by Trailing Suction Hopper Dredger (TSHD) in Phase 1. It is envisaged that either a backhoe dredger, TSHD or Cutter Suction Dredger (CSD) could be used for dredging the clay and mudstone deposits for Phases 1 and 2 (and sands and gravels for Phase 2).

Use and disposal of dredged material (habitat enhancement)

1.3.7 The proposed dredging would generate silts, sands, gravels, clay and rock. As noted above, the silt to be dredged during Phase 1 and 2 is contaminated. Appendix 3.1 of the ES sets out the options available for the management of contaminated dredged material.

1.3.8 It is proposed that some of the (uncontaminated) sand and gravel from the capital dredging during Phase 1 would be used within Bran Sands lagoon as part of the habitat enhancement proposals. This would comprise the placement of dredged material within the lagoon to raise the bed level and provide a feeding habitat for waterbirds. A layer of fine mud would be placed over the sands and gravels. A proportion of capital dredged clay and mudstone would also be used to create a series of islands in the lagoon to provide nesting and roosting areas for waterbirds.

1.3.9 The volume of material required for the habitat enhancement proposals is small in comparison with the overall volume of material to be dredged. Other beneficial uses for this material will continue to be sought but, for the purposes of the EIA, it has been assumed that the rest of the dredged material (with the exception of the contaminated silts) would be disposed offshore (in a designated disposal ground).

Overland conveyor system

1.3.10 The conveyor system is proposed to consist of two parallel belt conveyors running in a single elevated conveyor bridge. The conveyor bridge would be a combination of enclosed and open trestle structures. The polyhalite would not be exposed to the atmosphere at any point along its route, as the product needs to remain dry.

1.3.11 It is proposed that the conveyor system would pass over all existing infrastructure between the MHF and the port terminal, excluding the National Grid power lines which are to be under-passed.

1.3.12 The proposed conveyor route envelope from the MHF to the port terminal splits at the south-eastern corner of the Bran Sands landfill site, resulting in a route that would run either along the northern or southern boundary of the landfill site. There would only be a requirement for a conveyor along one of these routes (i.e. they are options).

Construction programme

1.3.13 The current programme of works proposes that the mobilisation of construction plant, machinery and personnel to site is to commence in January 2017 and continue for a period of 2 months. The minimum construction period for both Phase 1 and 2 is 17 months. Phase 2 works are programmed to commence within 6 years of the completion of Phase 1.

Operational phase

1.3.14 Following the end of construction, the port terminal has been designed for a throughput of 6.5mtpa during operational Phase 1 (years 0 to 6) and 13mtpa during operational Phase 2 (years 6 to 50). Vessels using the port would be bulk carriers and it is estimated that approximately 191 vessel calls per year could be expected during operational Phase 2.

1.3.15 It is proposed that waste water generated from the facilities would be treated onsite and discharged to the River Tees. It is expected that maintenance dredging requirements would be met through the existing maintenance dredging regime.

Personnel

1.3.16 It is anticipated that construction phase employment for the Harbour facilities would peak at 175 employees per day during months 29 and 30 of the construction period. YPL predicts an operational staff of six per shift during Phase 1, with a total of 26 operational staff over the duration of one day. It is predicted that there would be eight operational staff per shift during Phase 2, with a total of 34 operational staff over the duration of one day. Car parking for up to 7 cars is envisaged.

Decommissioning

1.3.17 The proposed port terminal would be a long term infrastructure proposal, with no plans to decommission it. As such, decommissioning of the port terminal was not considered in the EIA.

1.3.18 The decommissioning of the conveyor system would comprise the complete removal of site infrastructure (including site wide utilities, concrete / steel structures, platforms, foundations and drainage systems) and remedial works to allow the site surfaces to blend into the surrounding environment. Materials would be kept on site and used within the restoration works, where possible. Materials which are taken off-site would be recycled if suitable.

1.4 The EIA process and method

EIA and the ES

1.4.1 The objectives of the EIA process are to ensure that environmental factors are considered throughout the project and in the decision making process, and that significant environmental effects (both positive and negative) are identified and assessed. As a result of this assessment process, measures to avoid or minimise any adverse impacts (mitigation measures) are identified.

1.4.2 The ES was prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009, as amended by the Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2012, and contains:

- A description of the development, including any alternatives considered.
- A description of the existing environment at the site and surrounding areas.
- Prediction of the potential impacts on the existing human, physical and natural environment at the site and on the surrounding environment, and assessment of the perceived effects.
- A description of mitigation measures employed to avoid or reduce any perceived significant effects.

1.4.3 Consultation is an ongoing part of an EIA that seeks the opinions of the planning authorities, statutory agencies, companies and individuals which may be impacted by the application (stakeholders).

Assessment methodology

1.4.4 In order to assess the impacts that a project may have with respect to a particular environmental topic (e.g. air quality or ornithology) it is important to look at the current conditions (or baseline) in the area that could be affected (the study area). This tends to be done through either desk study or site survey (or both).

1.4.5 Each section of the ES outlines the methodology used for the assessment of that topic. Assessment methodologies differ between topics but largely follow a similar overall approach. This approach identifies any people, places, characteristics and habitats that may be affected (the 'receptor') and determines how sensitive this receptor is to impacts (the 'sensitivity'), based on is value (importance), adaptability, tolerance and recoverability. Effects that could arise due to the project are identified and the severity of the effect predicted (the 'magnitude') is determined. Effect magnitude is dependent on how much change the receptor is likely to experience from baseline conditions. The magnitude of the effect and the sensitivity (and/or value) of the receptor are then used to determine the significance of the 'impact'. In general, where impacts are predicted to be moderate or major, they are considered to be 'significant'.

1.4.6 Where negative impacts are predicted to occur, where possible, mitigation is identified to reduce the impact as far as possible. Mitigation tends to be in two forms; mitigation that is built into the design of the project to reduce impacts that are identified at an early stage and mitigation that is proposed in

response to the impacts predicted in the EIA. Impacts are then reassessed, taking into account the proposed mitigation measures, to provide a residual impact.

2 SUMMARY OF ENVIRONMENTAL IMPACTS PREDICTED

2.1 Introduction

2.1.1 Each topic examined in the ES regarding the predicted impacts of the proposed Harbour facilities is considered below in turn. The key outcomes are highlighted; full details are provided in the ES.

2.2 Hydrodynamic and sedimentary regime

2.2.1 Hydrodynamic and sediment transport modelling were undertaken for the proposed Harbour facilities. A TELEMAC-3D flow model was established to simulate currents in the Tees estuary and Tees Bay. The model was used to simulate the effects of the scheme, comprising the proposed dredging and both the open and solid quay options for the completed (Phase 1 and 2) quay, on the baseline (existing) case.

2.2.2 The modelling undertaken predicted that the effects of the proposed works, and the new quay line/revetment in particular, on tidal currents and waves would be of a relatively small scale and local to the scheme. No change in the supply of fine sediment from offshore is predicted and the predicted accumulation of sediment within the berth pocket and the section of the approach channel to be dredged would represent a redistribution of the material that currently settles within the lower estuary only. As a result, no effect on the overall sedimentary regime of the Tees estuary is predicted and no effect on intertidal morphology (and, consequently, no indirect impacts would arise on intertidal areas used by waterbirds and fish).

2.3 Hydrology, hydrogeology and land quality

2.3.1 Definition of the environmental baseline was informed by data collated for a desk-based Preliminary Risk Assessment, third party reports and data collected during a Phase 2 intrusive site investigation.

2.3.2 The site is predominantly flat and comprises a utilities corridor south of the Bran Sands landfill and an embankment west of the lagoon. Immediate neighbours include other commercial / industrial operators as well as residential developments. A number of landfills are also located in the vicinity of the site.

2.3.3 The British Geological Survey published mapping and the Geology of Britain Viewer indicates that the majority of the site is underlain by Made Ground deposits, beneath which are superficial deposits comprising Tidal Flat deposits (sand, silt and clay) and Glaciolacustrine Deposits (clay and silt). The bedrock geology comprises mudstone of various ages. The results of intrusive investigations at the site generally concurred with the published geology and indicated that the Made Ground comprises of ‘slag’ to a considerable depth (approximately 10m). There are no sites designated for geological importance within the footprint of the proposed scheme.

2.3.4 Soil samples recovered from the site exhibited a limited range of potential contaminants of concern at concentrations exceeding human health assessment criteria for a commercial end use. Leachability

testing of samples recovered from the Made Ground also indicated that a number of contaminants of concern were potentially mobile at concentrations exceeding Environmental Quality Standards (EQSs).

2.3.5 There is hydraulic continuity between Bran Sands lagoon and the River Tees (via a pipe through the embankment) and with the groundwater present in the Made Ground. There are no surface water abstraction points within the proposed scheme footprint. However, there is one surface water abstraction point from the Tees approximately 500m to the north of the site boundary, which is utilised for cooling purposes.

2.3.6 The majority of the site is covered by alluvial deposits – a Secondary Aquifer (Undifferentiated). Below these, the bedrock aquifer has been designated as a Secondary B Aquifer. There are no groundwater abstraction points or Special Protection Zones (SPZs) present within the study area. The WFD quality status of the Tees Mercia Mudstone and Redcar Mudstone groundwater body has been defined as poor. Groundwater monitoring has indicated exceedances of the WFD estuarine EQSs for chromium, copper, zinc, iron, mercury, toluene and xylene.

2.3.7 Significant ground gas concentrations have also been recorded around the perimeter of the Bran Sands Landfill, although a monitoring well located on the embankment west of the lagoon (adjacent to the proposed quay) did not detect elevated gas concentrations.

2.3.8 During the construction phase of the project, with best practice procedures in place (to be secured through the Construction Environment Management Plan, the CEMP) and the avoidance of water bodies/surface water features as far as possible, predicted impacts range from those of negligible significance upon hydrology and human health receptors to those of minor adverse significance on hydrogeology. During the operational and decommissioning phases, predicted impacts upon hydrology and hydrogeology are of minor adverse significance, with an impact of negligible significance predicted on human health.

2.3.9 The assessment assumed that a range of environmental risk mitigation measures would be embedded within the works; in addition, further mitigation measures would be adopted, including the development of an asbestos management strategy, further investigation and assessment of the ground gas regime and adoption of the principles of the CL:AIRE Code of Practice.

2.4 Marine sediment and water quality

2.4.1 Existing marine water and sediment quality within the study area was investigated. The impact assessment took into account the requirements of European and national legislation and policy concerning EQSs for chemical contaminants and guideline values to determine water and sediment quality.

2.4.2 Previous sediment quality surveys undertaken in the Tees estuary have identified elevated concentrations of both heavy metals and Polycyclic Aromatic Hydrocarbons (PAHs) in the study area. The results from the survey undertaken for the proposed scheme were consistent with this data and identified metal and PAH concentrations in estuarine sediments which exceed Cefas Action Levels 1

and 2. The results also identified that contamination increases with depth through the vibrocore samples obtained (within the silts), demonstrating the influence of historical industry which once dominated the area. In comparison, water quality has shown improvements over the last 30 years; and this is reflected in data obtained by the Environment Agency where samples from very few sites in the Tees exceed the EQS for contaminants.

2.4.3 The assessment identified a number of impacts that could arise with regard to marine and sediment quality during the construction and operation of the Harbour facilities. These impacts include re-suspension of sediment as a result of capital and maintenance dredging and piling, and deterioration of water quality as a result of surface-run off and accidental spills and leaks.

2.4.4 However it was concluded that, by following best practice guidance (particularly with respect to spill control and management) and implementing appropriate mitigation measures (e.g. use of an enclosed grab during silt dredging operations), the potential impacts of the proposed scheme on marine water and sediment quality are predicted to be of negligible significance.

2.5 Marine ecology

2.5.1 The Tees estuary comprises intertidal sand and mudflats, rocky shore, saltmarsh and sand dunes. Activities such as land claim and the construction of breakwaters and training walls have all significantly modified the estuary over the last 150 years.

2.5.2 The study area contains a number of sites which have been designated for their nature conservation value. For example, Seal Sands is an important haul-out site for both common (harbour) seals and grey seals. Monitoring undertaken by the Tees Industry Nature Conservation Association (INCA) identified that the 2012 season saw the birth of 18 seal pups, which continues an upwards trend in pup births evident in recent years.

2.5.3 The intertidal area within the footprint of the port terminal consists of a mixture of bricks, rubble, road planings and gabions with areas of mud and standing water. It is estimated that the intertidal habitat within the footprint of the proposed port terminal comprises approximately 60-70% hard substrata and 30-40% mud. The habitat present is considered to be of low quality as demonstrated by the fact that there is a consistently low level of usage of this area by feeding waterbirds when the intertidal area is exposed and potentially available for waterbird feeding.

2.5.4 A number of potential impacts have been identified which could arise during the construction and operational phases of the proposed scheme, including the direct removal of the invertebrate resource due to capital dredging, piling and reclamation (solid quay only), indirect impacts on marine ecology due to potential reductions in water quality, noise disturbance to marine ecological receptors and the smothering of benthic habitats due to the offshore disposal of dredged material.

2.5.5 The dredging that would be required to create the berth pocket and approach would result in the direct loss of 16ha of the benthic community. This would not constitute a long term loss, as subtidal habitat would still be present below the dredged footprint but, in the short term, the benthic community would

be removed. Given the nature of the subtidal habitat and the fact the dredging would not result in an irreversible loss of habitat, a minor adverse impact was predicted.

2.5.6 The proposed scheme would result in the long term direct loss of up to 3.6ha of intertidal habitat due to reclamation (solid quay option) or the installation of a revetment (open quay option). In light of the quality of the intertidal habitat (described above), this feature is considered to be of low value and, as such, a minor adverse impact predicted. Notwithstanding this, habitat enhancement measures (in Bran Sands lagoon) have been designed into the proposed scheme in order to incorporate biodiversity enhancement into the proposals. In addition, YPL are happy to commit to making a contribution to the implementation of habitat improvement measures at Portrack Marsh and in the Tees.

2.5.7 The results of sediment plume modelling undertaken for the proposed scheme show that an average increase in suspended sediment would not occur over the intertidal for any of the potential dredge methods to be used during construction; leading to the prediction that negligible sediment would deposit onto intertidal areas.

2.5.8 An unmitigated impact of moderate adverse significance is predicted with regard to underwater noise and vibration disturbance to marine mammals during the construction phase. However, it is considered that the implementation of mitigation measures (i.e. adhering to JNCC 'soft start' guidelines) would result in a residual impact of minor adverse significance.

2.6 Marine and coastal ornithology

2.6.1 There are a number of sites within the Tees estuary that are designated (either in whole or in part) for marine and coastal waterbird interests under national and international legislation.

2.6.2 The bird count data collected by INCA shows that there is significant waterbird use of both Bran Sands lagoon and Dabholm Gut (see **Figure 1-1**) by a variety of bird species, with various species recorded in numbers exceeding 1% of the corresponding Tees Wetland Bird Survey (WeBS) site monthly count for at least one month. Bird surveys undertaken by INCA at low water indicate that functionality of the intertidal on the Tees in the footprint of the proposed scheme as a feeding area is limited.

2.6.3 The assessment has identified that the proposed scheme has the potential to result in impacts on marine and coastal ornithology. Potential construction phase impacts include:

- impacts to the feeding resource due to reduced water quality (associated with dredging);
- smothering of the intertidal food resource through deposition of sediment following dredging;
- disturbance to feeding and roosting waterbirds, particularly during piling for the conveyor and port terminal; and,
- reduced feeding habitat due to loss of intertidal habitat.

2.6.4 Potential impacts on the feeding resource and disturbance would be temporary during the construction phase. The potential disturbance impact to waterbirds from noise and activity would be mitigated through the use of acoustic screening between the works and Bran Sands lagoon and Dabholm Gut.

With this mitigation in place, potential disturbance related impacts are predicted to be of negligible significance.

2.6.5 The scheme includes measures in Bran Sands lagoon to enhance habitats for feeding and roosting waterbirds and it is predicted that there would be a net benefit as a result of the project in this respect.

2.6.6 Potential operational phase impacts include implications for existing feeding and roosting habitat, noise, visual and ship wash disturbance and interruption to sightlines and overshadowing.

2.6.7 Although the number of waterbirds using the intertidal area along the frontage is low in the context of the waterbird populations in the estuary, the fact that the intertidal habitat is scarce within the Tees makes further loss proportionately more significant in terms of bird use. Hence an impact of moderate adverse significance was anticipated in isolation given the value of the habitat which would be lost. With the implementation of the proposed habitat enhancement measures within Bran Sands lagoon, it is considered that there would be a net gain in the area and quality of habitat available for waterbird feeding.

2.6.8 The proposed scheme comprises the construction of structures around the perimeter of Bran Sands lagoon and this has the potential to affect the sightlines of waterbirds that use the lagoon as a feeding and roosting habitat. However, while the proposed structures are of significant height they are not of significant mass. Given the above, the proposed scheme would not minimise sightlines in any direction and disturbance related impacts during the operational phase are predicted to be of negligible significance.

2.6.9 In terms of overshadowing, the most significant effect would be due to the presence of the conveyor in the northern corridor, as the presence of this structure would result in some potential fragmentation of the lagoon habitat. However, this is not likely to result in significant behavioural effects or detract from the potential of this area to support feeding and roosting birds and hence an impact of low adverse significance is predicted.

2.7 Terrestrial ecology

2.7.1 An extensive suite of desk and species-specific surveys (for bats, amphibians, reptiles, water vole, otter and terrestrial birds) were undertaken between 2011 and 2014 to inform the Ecological Impact Assessment (EcIA). Based on the findings of the Phase 1 habitat surveys, it is considered that none of the habitats surveyed are of significance, being for the most part semi-improved calcareous or mesotrophic grasslands (unmanaged) which have lost most of their interest due to becoming overgrown and rank.

2.7.2 Whilst the Phase 1 surveys highlighted some areas of slightly more biological diversity, none of the areas surveyed were of sufficient botanical interest or habitat scarcity to merit more detailed investigation (e.g. Phase II National Vegetation Classification (NVC) survey) or examination for other biological groups such as invertebrates. NVC survey is normally only worthwhile in areas where there

is likely to be loss or damage to scarce or valuable habitat which may require mitigation, such as Local Wildlife Sites.

2.7.3 Both the construction and operational phases of the proposed scheme would give rise to impacts on terrestrial ecological receptors, however, all such impacts are predicted to be of negligible significance (without mitigation) or of minor beneficial significance.

2.7.4 On removal of all elements of the conveyor (during decommissioning) and the establishment of additional areas of grassland, scrub and woodland planting, the overall biodiversity value of the site would be expected to increase.

2.8 Fisheries and fishing activity

2.8.1 Tees Bay and the Tees estuary provide important habitats for a number of fish species. Environment Agency data on fish migrations shows that the month of May generally represents the start of the salmon and sea trout migration period, with migrations peaking during July or August. Salmon and sea trout migrations continue through to October and November, however the numbers of fish migrating during these months are significantly lower than in the peak months.

2.8.2 There is very limited commercial fishing activity within the Tees estuary itself, with most fishing efforts being undertaken offshore. Existing noise generated by shipping and industrial activity on the banks of the Tees estuary are likely to influence the fish distribution within the estuary.

2.8.3 The construction phase of the proposed scheme has the potential to impact upon fish species due to noise disturbance from piling and dredging, reduced water quality due to spills and leakages, and the direct uptake of fish and fish eggs during dredging.

2.8.4 Underwater noise modelling predicted that source noise levels would not result in a lethal effect on fish, however, traumatic injury could arise if fish are located within very close proximity to the source of the impact piling noise. It also predicted that there is greater potential for fish species to exhibit a behavioural response (in comparison with traumatic injury), due to the larger modelled impact range for a behavioural response (particularly in the case of herring). Piling activities would not present a constant noise source and those periods between pile driving (e.g. when repositioning the piling barge) would provide the opportunity for unimpeded movement of fish species within the estuary; moreover the noise disturbance to fish would cease once the piling works were completed.

2.8.5 The overriding consequence of the generation of noise during piling operations (as well as dredging and other construction activities) would be fish moving away from the noise source. Therefore, in the worst case, the construction works would be expected to result in the localised redistribution of resident fish species and temporary disturbance to migration patterns of fish passing through the Tees estuary. However, it is proposed that impacts to migratory fish would be minimised as far as possible through the implementation of timing restrictions on piling activity.

2.8.6 There is the potential for accidental releases of substances into the marine environment which could result in a pollution incident and consequently impact upon the health of marine species. The implications of a pollution incident on water quality, and therefore on other environmental parameters such as marine ecology and fisheries, are highly dependent on both the nature of the substance released and the scale of the incident. However, the risk of a pollution incident occurring and the extent of its impact on fish can be controlled through the implementation of appropriate mitigation measures, such as the adoption of good practice techniques (e.g. when refuelling) and ensuring the availability of spill kits on site.

2.8.7 The proposed dredging works have the potential to result in the direct uptake of fish, fish eggs and the food resources on which fish rely. The results of the benthic survey show that the benthic ecology within the navigation channel is likely to be influenced by maintenance dredging. The seabed in the berth pocket supports a different ecological community to the navigation channel. However, the direct disturbance to a localised area of subtidal habitat is unlikely to have a significant impact upon fish populations within the estuary. An impact of minor adverse significance is predicted.

2.8.8 Operational phase noise disturbance from vessel movements is not anticipated due to the existing heavy use of the Tees estuary by vessels.

2.9 Traffic and transport

2.9.1 The potential for traffic and transport impacts from the proposed Harbour facilities on the baseline highway environment within the identified local study area has been assessed. The assessment took into account other known committed developments within the study area.

2.9.2 In the worst case scenario, the residual impacts in relation to traffic and transport during the construction and operational phases are predicted to be of minor adverse and negligible significance respectively. Those elements of the YPP that would generate traffic within the wider study area and which could lead to cumulative impacts have been addressed at the project level and the conclusions are summarised in **Section 3** of this NTS (CIA).

2.10 Air quality

2.10.1 An assessment was undertaken which considered the potential for the proposed Harbour facilities to impact on local air quality at identified existing receptor locations during their construction, operation and decommissioning phases.

2.10.2 A construction (and decommissioning) phase fugitive dust and particulate matter assessment was undertaken in accordance with guidance provided by the Institute of Air Quality Management (IAQM). Site specific dust emission classes for activities associated with demolition, earthworks, construction and trackout were identified and mitigation measures recommended. As a consequence, the impact is not predicted to be significant.

2.10.3 A qualitative assessment was undertaken to consider potential emissions from Non-Road Mobile Machinery (NRMM) and onsite plant associated with the construction (and decommissioning) phases. Mitigation measures were recommended and, together with the temporary and short term requirement for NRMM and onsite plant, the impact on local air quality is not predicted to be significant.

2.10.4 An assessment of road traffic emissions associated with the construction and operational phases of the Harbour facilities was undertaken. The traffic generation associated with the proposed scheme was compared to relevant screening criteria and would be below the threshold for assessment and, hence, not significant.

2.10.5 An assessment of pollutant emissions as a result of traffic generated by the cumulative YPP was undertaken, for both the construction and operational phases. The assessment indicates that the cumulative impact of traffic emissions at sensitive receptor locations is not predicted to be significant.

2.10.6 Vessel movements associated with the operational phase of the proposed scheme were considered qualitatively, with predicted increases compared to existing vessel movements in the Tees estuary. In this context, the additional vessel movements were predicted not to be significant. Impacts associated with pollutant emissions from vessels docked at the proposed quay were predicted at the closest human receptors and designated ecological sites. The impact at human and ecological receptors is not predicted to be significant..

2.10.7 The transportation of product from the MHF to the vessels for export would be an enclosed process, with the only potential for emissions to air at the final loading point into the ship hatch. However, the product would be encased in a thin wax coating to prevent degradation of the pellets and, therefore, the potential for any dust generation is considered to be minimal.

2.11 Noise and vibration

2.11.1 Within the noise and vibration assessment, consideration was given to the potential impacts that could arise during the construction, operation and decommissioning phases at the most sensitive receptors surrounding the site and on the surrounding road network. The assessment was undertaken following consultation and in accordance with approaches agreed with the Environmental Health Department of RCBC. It drew upon the results of a detailed baseline noise survey, to establish the prevailing noise environment in the vicinity of the proposed scheme.

2.11.2 The majority of activities associated with the construction of the port and conveyor were predicted to generate noise levels that would be no more than the daytime noise threshold level at any of the surrounding residential and ecological receptors, and therefore satisfy the design guidance provided in British Standard 5228-1 and the National Planning Policy Framework (NPPF). A conventional approach to good construction noise management would be implemented though measures set out in the CEMP. Given this, the residual impact was predicted to be negligible.

2.11.3 Ground-bourne construction vibration (assessed at suitable residential and ecological receptors) and offsite construction road traffic were predicted to have impacts of negligible significance.

2.11.4 During the operational phase of the proposed Harbour facilities, noise over a day and night time period was predicted to be of negligible significance for all receptors.

2.11.5 Noise impacts associated with decommissioning activities would be similar (and most likely of lower significance) to those identified for the construction phase.

2.12 Archaeology and heritage

2.12.1 The potential for impacts from the proposed Harbour facilities upon the known archaeology and cultural heritage resource in the study area, including individual heritage assets, was assessed.

2.12.2 Record searches were conducted of the Redcar and Cleveland Historic Environment Record (HER), Tees Archaeology HER and the National Record for the Historic Environment in order to ensure that all known heritage assets were identified and an Archaeological and Heritage Desk-based Baseline Appraisal was produced.

2.12.3 Following this and a heritage site visit in February 2014, the potential for setting effects associated with the port facilities were scoped out. The site and surrounding area show very obvious signs of recent and (in some cases) now ceased modern heavy industrial activity and manufacturing.

2.12.4 Heritage setting assessment work was conducted in November 2014 for the conveyor. This concluded that there would be no change to the settings of the vast majority of the heritage assets identified in proximity to the overhead conveyor system. Any views of the conveyor from surrounding assets would also include the large scale modern industrial facilities at Wilton, Teesside and other industrial plants, meaning that there would be no material alteration to the setting and no resultant harm.

2.12.5 No areas of previously undisturbed ground were identified as falling within the proposed scheme footprint, with the exception of the extreme easternmost section, adjoining the Wilton MHF site. This area was subject to ground-truthing for a recorded archaeological feature. No standing structures, earthworks or any evidence for medieval or later settlement was identified.

2.12.6 None of the residual impacts identified as part of this assessment would cause substantial harm under the terms of the NPPF (2012). Overall, the assessment identified nothing that would preclude the development of the proposed scheme on heritage grounds.

2.13 Commercial navigation

2.13.1 The potential for impacts from the Harbour facilities upon commercial navigation within the Tees estuary was assessed. The estuary experiences significant commercial vessel traffic, with up to approximately 900 shipping movements taking place every month (based on data from 2013 and the first 10 months of 2014). The approach channel is maintained by PD Ports, which has a statutory responsibility to maintain the channel for safe navigation. Traffic in the Tees estuary is controlled by a sophisticated Vessel Traffic Service (VTS).

2.13.2 The potential impacts of the proposed scheme on commercial navigation are considered to be well understood, and were informed by the production of a Marine Navigation Risk Assessment (which utilised a large and complete data set of shipping traffic data sourced directly from the Harbour Master) and by hydrodynamic modelling.

2.13.3 It was predicted that the Harbour facilities would result in impacts of negligible significance on commercial navigation during both the construction and operational phases. Nevertheless, a number of controls should be implemented to ensure safe navigation, including the issue of Notices to Mariners, and ensuring that all construction vessels have appropriate signals.

2.14 Coastal protection and flood defence

2.14.1 The Tees estuary contains both formal and informal flood defences which contribute to minimising the risk of flooding to adjacent developments. The Environment Agency's Tees Tidal Flood Risk Management Strategy has identified the requirement to raise existing flood defences within the estuary, upstream to the Tees Barrage.

2.14.2 The footprint of the proposed port terminal is within Flood Zone 3. It is accepted that it comprises 'water-compatible' development and would be constructed in a high flood risk area.

2.14.3 The Harbour facilities overall fall within Flood Zones 1, 2 and 3. The key flood risks to the site are from tidal sources, particularly in the southern and western areas. The other major flood risk is from pluvial (rain related) flooding. While the conveyor route is in Flood Zones 1, 2 and 3, it is proposed that it would be elevated to a minimum invert level of +5.25mAOD and would not be at risk of flooding.

2.14.4 Hydrodynamic modelling has shown that the open quay structure is predicted to fully transmit wave energy through to the shore protection behind the quay. A highly localised strip of increased wave height is predicted adjacent to this structure due to the dredging required for the scheme. The solid quay structure has higher reflection properties than the existing shoreline. The effect of it in reflecting wave energy towards the north would result in localised increases in significant wave height. However, based on the predicted increases, an impact of negligible significance is predicted with regard to increased flood risk due to these alternations.

2.15 Infrastructure

2.15.1 The potential for impacts from the proposed Harbour facilities upon relevant infrastructure within the study area has been assessed through a combination of desk-based assessment, online searches, site walkovers and consultation (which is on-going).

2.15.2 The routes of the two conveyor corridor options intercept a number of infrastructure assets, including an underground gas main pipeline, the Hot Metal line, a railway line, roads, an embankment (classified as a landfill site) and bridges. There are numerous other pipelines and assets present within the immediate vicinity of the southern corridor, as well as pipelines and tunnels which cross underneath the

Tees estuary. The potential therefore exists for adverse impacts to occur to such assets during construction and decommissioning. Fewer infrastructure constraints exist within the northern corridor.

2.15.3 Although this potential exists, the conveyor system will be designed to ensure that its construction, operation and decommissioning would not impact upon existing infrastructure assets (e.g. through careful siting and hand excavation where required). No impacts are, therefore, expected.

2.15.1 The capital dredging within the estuary would reduce the depth of cover overlying the Breagh Onshore Gas pipeline and, therefore, the potential exists for indirect impact on this asset to arise due to heave and the seepage of water. Given this, subject to detailed geotechnical information and assessment, a strategy of soil stiffening above the pipeline could be implemented prior to dredging being undertaken. With an appropriate mitigation strategy in place, it is anticipated that the risk of an indirect impact occurring due to dredging (e.g. heave) would reduce to a low level.

2.16 Socio-economics

2.16.1 Construction employment for the proposed scheme would average at 122 employees per month with two peaks of 175 employees. This peak represents 1.7% of the total employment in Dormanstown ward. The operational workforce would be 26 employees at 6.5mtpa and 34 employees at 13mpta. In the context of the local labour market, this increase in demand for labour would not have a significant effect.

2.16.2 There would be beneficial indirect and induced impacts resulting from the investment in construction and through operational expenditure. Initial investment to reach an output of 6.5mtpa would be £75m; of which £42m would be purchases. Through the supply chain, this would result in 413 indirect jobs and 70 induced (one year) jobs in the economy. The geographical distribution of this expenditure cannot be accurately estimated, but a significant proportion could be within the Redcar and Cleveland, Middlesbrough and Stockton-on-Tees districts and the Local Enterprise Partnership (LEP) area, resulting in a negligible to minor beneficial impact.

2.16.3 For the £74.8m of construction investment in Phase 1, the direct GVA would be approximately £30m. The estimated annual GVA generation associated with 6.5mtpa of product would represent approximately 0.2% of the current estimated GVA of the Tees Valley LEP. Including induced and indirect GVA, there would be a total annual GVA increase of £35.4m or a total increase over the construction period of £50m. There would be further GVA benefits associated with the expansion to 13mpta of output (see **Section 3**).

2.16.4 Once operational, there would be wider multiplier benefits during the operational phase due to spending through the supply chain, supporting jobs in the wider economy and as employees spend their wages. This would also result in indirect and induced jobs.

2.17 Landscape and visual character

2.17.1 The proposed scheme footprint is entirely located within the heavily industrialised setting of the Teesside industrial and port complex, which is characterised by very large scale steelworks, port, petroleum and chemical production sites. The landscape is further fragmented by road and rail links passing through the centre of the south bank industrial complex between Middlesbrough and Redcar.

2.17.2 Reminders of the earlier estuarine landscape are present across the mouth of the River Tees at North Gare Sands and Bran Sands and are noted for their international wildlife value in addition to providing local opportunities for recreation. Fragmented pockets of green space remain within the industrial complex, although these are typically heavily altered and form part of separation zones or connecting pipeline and access corridors.

2.17.3 The landscape and visual character within the study area is dominated by industrial activity with large buildings, cooling towers, chimney stacks, distillation towers and flare stacks, with their associated plumes and emissions being visible in foreground, midground, background and in skyline views in most directions.

2.17.4 Views to the proposed scheme footprint are relatively limited, being contained by surrounding industrial structures, raised landforms and screen planting. Local views to the conveyor corridor are possible from nearby residential areas at Dormanstown, the A1085, the Redcar to Middlesbrough Railway and from Public Rights of Way (PRoW). Distant views to the footprint of the proposed port facilities would be possible from beaches and dunes, including areas of wildlife value, across the mouth of the Tees estuary.

2.17.5 An assessment of potential effects on landscape character has been undertaken and concluded that the proposed scheme would be in keeping with the existing industrial character of the landscape and would not give rise to any significant adverse or beneficial effects.

2.17.6 An assessment of potential effects on visual receptors has been undertaken and concluded that the proposed scheme would give rise to some significant adverse effects within existing views from nearby residential areas, the A1085 road crossing and in views from PRoW between the A1085 and Bran Sands site during the construction, operation and decommissioning phases of the scheme. Mitigation measures would be employed to minimise adverse effects but the presence of the raised conveyor structure as a new element within available views would remain. At the A1085 crossing point, it is proposed that the conveyor bridge structure would be designed to reflect the role that the road corridor plays in providing a gateway to Redcar.

2.17.7 No significant adverse effects are predicted due to the lighting proposals associated with the Harbour facilities.

2.18 Recreation and access

2.18.1 The potential for impacts from the proposed Harbour facilities in relation to recreation and access has been assessed. Water based recreational activities generally do not take place within the study area and, therefore, were scoped out of the assessment.

2.18.2 The Tees estuary supports a range of land based recreational activities, many of which are highly seasonal and the majority of which are outside the areas of the main river and port operations. The main recreational activity undertaken within the study area comprises walking along the PRoW, including the Teesdale Way National Trail. Within the proposed scheme footprint, there is one dead end footpath (adjacent to Dabholm Gut), one combined footpath and traffic-free cycle route (alongside the A1085 road) and the Teesdale Way National Trail.

2.18.3 The potential exists for direct disturbance onto recreational users of footpaths during the construction and decommissioning phases due to the presence and movements of machinery and heavy plant. However, such impacts would be limited through the implementation of a temporary closure of the PRoW adjacent to Dabholm Gut and, potentially, temporary closures (to enable night time working) of the affected sections of Teesdale Way National Trail and the combined footpath and traffic-free cycle route. Direct disturbance impacts to recreational users would not occur during the operational phase as the conveyor would be elevated and covered to prevent product falling from it.

2.18.4 There is also potential for indirect disturbance to recreational users of the footpaths during construction, operation and decommissioning due to noise and visual disturbance and reduced air quality. It is predicted that a combined indirect impact of minor adverse significance would occur during the construction and operational phases of the proposed scheme (largely due to the visual effect). The residual impact associated with indirect disturbance during decommissioning would be of negligible significance.

2.19 Disposal of capital dredged material

2.19.1 Taking into account the fact that contaminated material cannot be disposed offshore, as a worst case (i.e. all capital dredged material apart from the contaminated material), it is proposed that the following quantities of dredged material would be disposed offshore at dredged material disposal sites in Tees Bay:

- 615,000m^3 of clay and mudstone (open quay structure); and,
- 326,000m^3 of sand and gravel (open quay structure; for the solid quay all sand and gravel could be used and would not be disposed offshore).

2.19.2 Although the contaminated silts would not be disposed offshore, the modelling undertaken with regard to this disposal included the assessment of fine sediments on a precautionary basis. The disposal of material offshore has the potential to have an influence on fish populations and fisheries, benthic ecology and commercial navigation. However, the assessment of the dispersion of fine sediment from the offshore disposal site shows that there would be a minimal effect on water quality beyond the boundary of the site. Hence it was concluded that there would be no significant impact on fish and fisheries interests due to offshore disposal of dredged material.

2.19.3 The proposed quantity of the disposal of dredged material at the site would be significantly greater than the amount of material that has been deposited at the site over recent years. The disposal would be

expected to smother the seabed within the (designated) disposal site but any longer term erosion and dispersion of material from the site would not be detectable on the seabed outside of the site. An impact of negligible significance was therefore predicted.

2.19.4 The number of vessels transiting through the channel in the study area at any one time would be low, and no significant impact on commercial navigation is predicted.

3 CUMULATIVE IMPACT ASSESSMENT

3.1 Introduction

3.1.1 A tiered approach was adopted for the CIA, based upon the following definitions:

- Site-specific (or within-development) cumulative impacts – different effects associated with the Harbour facilities have the potential to interact and, together, influence common receptors (e.g. noise and visual effects on ecology). Where applicable, these inter-relationships are considered in the Harbour facilities ES (in ES Section 23) and Habitats Regulations Assessment (HRA; **Document 6.3**).
- Project-wide cumulative impacts which arise from the combined effects (additive or interactive) of the Harbour facilities with the other components of the YPP. These are considered in Part 2 of the CIA (**Document 6.6**).
- Wider cumulative impacts which are the combined impacts (additive or interactive) that may occur between the Harbour facilities, the YPP (where appropriate) and any other relevant 'non YPP' development(s). These are considered in Part 3 of the CIA.

3.1.2 Construction and operation phase cumulative impacts have been predicted, but not cumulative decommissioning impacts, as these are considered to be too speculative to predict with any confidence or certainty. The conclusions of Parts 2 and 3 of the CIA are summarised below.

3.2 Socio-economics

3.2.1 With regard to potential socio-economic impacts, a temporary beneficial impact during the construction phase (of up to moderate beneficial significance) is predicted due to employment opportunities across the YPP. YPL is committed to maximising the number of firms within the LEP that are able to access and succeed in tendering for opportunities and is working in partnership with the LEP stakeholders towards this goal. In the context of the LEP economy, the indirect impact of investment and job creation, therefore, could be temporary, short term and major beneficial at a LEP level.

3.2.2 Increased expenditure during the YPP construction phase by YPL would result in economic benefits for the supply chain of major beneficial significance and beneficial effects in terms of 'value added' to the economy and in terms of tax revenue. Further beneficial impacts in terms of construction and operational phase employment generation are predicted when the YPP is considered with other plans and projects.

3.2.3 During the operational phase, beneficial employment effects are predicted of up to major beneficial significance at the North York Moors National Park (NYMNP) and RCBC level. The demand for operational labour would not result in any pressure on the labour market that cannot be absorbed by natural churn of employees. Therefore, there would be no impact due to the YPP on the labour market at any spatial level. It was also concluded that the likely impact with respect to the demand for accommodation would be negligible.

3.2.1 The YPP would make substantial contributions to direct, indirect and induced employment, GVA and tax. Whilst these effects are very large, especially for the effects of a single project, they may be dispersed around the country and, in the context of the UK economy as a whole, they would be of negligible significance. However, inevitably, this would be true for any single project. Moreover, the project would have significant and positive economic benefits, directly, through employment and output and, indirectly, through the supply chain and employee expenditure. It would result in an increase in GDP; a nationally significant reduction in the trade deficit; over 1,000 high value direct jobs and many more in the supply chain, boosting the employment rate and spending power; corporate and income tax receipts; and royalty payments. The project would be effective in contributing to meeting a need to rebalance the national economy and substantially strengthen the regional and local economies. The in-combination macro-economic effects at national level with respect to exports would be major beneficial and permanent.

3.2.2 When assessed with other non-YPP plans and projects, minor beneficial effects are predicted with regard to supporting local tourist accommodation providers. The cumulative effect of employment would be major beneficial within Redcar and Cleveland, Stockton-On-Tees and the NYMNP, and minor/moderate beneficial for the wider regional economy.

3.3 Traffic and transport

3.3.1 The cumulative traffic and transport assessment assessed the potential in-combination traffic and transport impacts of the Mine, MTS, MHF and Harbour facilities on the baseline highway environment within the identified study area for the Harbour. The assessment also took into account the proposed construction and operational P&Rs, as well as other committed developments within the study area.

3.3.2 Residual impacts in relation to traffic and transport during the construction and operational phases are forecast to be of minor adverse significance at worst.

3.4 Noise and vibration

3.4.1 As set out above, the traffic data generated for the project included cumulative increases in traffic from all YPP components and the predicted traffic generated by committed developments. Noise levels at all assessed receptor locations defined for the Harbour facilities, MHF, MTS and Mine components due to traffic were predicted to be below the relevant Design Manual for Roads and Bridges (DMRB) standards and objectives; hence no cumulative impact would arise.

3.4.2 No significant cumulative impacts are predicted when the YPP is assessed together with the potential impacts of other non-YPP plans and projects.

3.5 Air quality

3.5.1 A cumulative road traffic emissions assessment was undertaken to consider the impact of all elements of the YPP. Detailed air dispersion modelling was undertaken and NO_2, PM_{10} and $PM_{2.5}$ concentrations predicted at identified receptor locations for both ‘without’ and ‘with’ YPP development scenarios.

Predicted pollutant concentrations were compared to the relevant air quality Objectives and changes in pollutant concentrations were compared to relevant significance criteria. The results of the assessment showed that changes in pollutant concentrations, as a result of the cumulative impact of road traffic during construction and operation phases of the YPP, are not predicted to be significant.

3.5.2 The YPP cumulative impact assessment for air quality (including dust/fine particulates and the effect of road traffic emissions) also concluded there would be no significant impacts on human receptors. Construction phase emissions from the Harbour facilities (capital dredging and other plant) were not considered to require detailed assessment due to the short term nature of the impacts and a lack of nearby sensitive receptors.

3.5.3 Furthermore, the cumulative air quality assessment of construction and operational phase controlled plant, shipping, traffic and process emissions with non-YPP plans and projects predicted that any effects would not be significant.

3.6 Hydrogeology and land quality

3.6.1 Potential cumulative impacts on geology and hydrogeology were considered with respect to aquifers and surface waters at the catchment scale. The YPP cumulative assessment concluded that the significance of the potential impact on groundwater due to the installation of foundations and piling is predicted to be negligible. There would be no deterioration in the status of the groundwater body.

3.6.2 In addition, the maximum potential cumulative impact which could be associated with risks to land quality from piling activities as a result of the Harbour facilities with non-YPP developments was predicted to be of negligible significance.

3.7 Hydrology and flood risk

3.7.1 Assessment of the potential for cumulative impacts on hydrology and flood risk incorporated the consideration of potential impacts on the supply of fine sediments and contaminants, direct disturbance to watercourses during construction, and the potential for changes to existing flood risk through increased surface flows during the operational phase.

3.7.2 Cumulative impacts were assessed to be of negligible significance for the YPP and no deterioration in the status of relevant water bodies was predicted. This conclusion held when the YPP was assessed with non-YPP plans and projects.

3.8 Terrestrial ecology

3.8.1 With regard to terrestrial ecology, the potential for cumulative impacts included habitat loss and effects on noise levels and lighting during construction and operation. However, it was concluded that a cumulative impact would not arise with regard to habitat loss due to the YPP in combination. It was also concluded that there would be no cumulative impacts on designated sites, habitats or species due to lighting, noise and vibration, air quality and transport emissions due to the Harbour facilities in

combination with the other components of the YPP. No significant cumulative impacts as a result of the operational phase of the YPP were predicted.

3.8.2 Cumulative impacts with non-YPP plans and projects, including potential habitat loss and disturbance to protected species, were assessed as being of negligible and minor adverse significance respectively. With regard to protected species (specifically reptiles and birds), appropriate mitigation would reduce the impact to a negligible level.

3.9 Landscape and visual environment

3.9.1 The CIA undertaken with respect to the landscape and visual environment for the YPP took account of other relevant projects (as agreed with Natural England and the NYMNPA) in the first instance.

3.9.2 Of the YPP construction phase elements, the temporary winding towers at the Mine and MTS sites were identified as having the potential to create project-wide cumulative impacts. Assessment of the YPP, using ZTV mapping and fieldwork identified that the proposed winding towers would not cause project-wide cumulative impacts due to the large distances between the towers and their relative scale within expansive views. At all locations assessed, the cumulative impact would not exceed the worst case individual winding tower impact.

3.9.3 Changes in construction phase traffic and HGV flows would give rise to a localised moderate adverse impact on landscape character along the B1416 corridor where it passes through the Central and Eastern Moors (1B) character area. Construction phase traffic is predicted to result in a minor adverse impact along other road corridors, including the A171 and A169. Operational phase traffic flows are not predicted to have an impact on landscape character, with perceptible effects remaining.

3.9.4 The overall construction phase cumulative impact of the YPP on the designated landscapes of the NYMNP and North Yorkshire and Cleveland Heritage Coast was predicted to be minor adverse.

3.9.5 The duration of winding tower impacts would be up to four years at the Mine site and around 3 years at the Lady Cross Plantation, Lockwood Beck and Tocketts Lythe MTS sites. Cumulative in-combination and in-succession visual and character effects associated with the Mine and MTS towers would last for around three years, with the more limited impacts associated with the Mine winding towers alone continuing for a further year.

3.9.6 Sequential impacts within views from linear receptors would broadly comprise significant adverse impacts for sections of routes that lie relatively close to the project sites and are within open areas (moorland for example), as well as a wider range of less significant impacts for sections of routes that are distant from the sites or pass through complex wooded landscape (the Esk valley for example).

3.9.7 Adverse cumulative impacts are not predicted to arise during the operational phase of the YPP, due to the limited extent of scheme effects, the distance between the operational sites and the lack of intervisibility between the sites. Minor beneficial operational phase cumulative impacts are predicted to occur as a result of the proposed habitat improvements at the Mine and Lady Cross Plantation sites,

and proposed native broadleaved woodland planting across the NYMNP as a carbon offsetting measure.

3.10 Cultural heritage

3.10.1 No project-wide cumulative impacts would result from the proposed developments at the Mine, the three MTS Intermediate Shaft Sites, the MTS Portal and MHF, and the Harbour facilities.

3.10.2 In terms of potential physical cumulative impacts, none of the areas that would be affected by these separate components of the YPP have been found to contain significant concentrations of archaeological remains. Only a small number of primarily agricultural and industrial remains of recent origin and limited, if any, heritage significance have been identified. It has been agreed with English Heritage, the NYMNPA archaeologist and RCBC that the small number of possible anomalies identified during geophysical survey are anticipated to be of potentially limited significance and any impacts on them could be mitigated, if necessary, through an industry-standard programme of archaeological monitoring (e.g. controlled archaeological strip / watching brief). Only if a substantial number of these anticipated lower-value heritage assets were to be significantly adversely impacted across the entire YPP would a material cumulative impact occur, which is not predicted to be the case. Rather, only a small number of low-value heritage assets (predominantly post-medieval / modern agricultural and industrial features) have been identified as being susceptible to an overall limited level of impact. Cumulatively, therefore, no physical impact is anticipated with respect to the heritage resource due to the YPP or any other non-YPP development.

3.10.3 In terms of potential non-physical cumulative impacts (for example a cumulative impact that occurs due to the alteration of the setting of heritage assets as a result of the YPP), only two Grade II Listed farm buildings at Plantation Farm would be susceptible to an impact as a result of alteration to their setting. Grade II Listed is the lowest listed status and the farm buildings would only be susceptible to a possible small level of indirect impact as a result of the proximity of the proposed intermediate shaft at Tocketts Lythe. As no other heritage assets would sustain any level of harm through the alteration of their settings, and no other YPP components (including the Harbour facilities) or relevant non-YPP developments have the potential to affect the Grade II Listed buildings that could be affected by Tocketts Lythe, no non-physical cumulative impact is anticipated with respect to the heritage resource.

3.11 Amenity and recreation

3.11.1 No direct or indirect cumulative amenity and recreation impacts are predicted to result from the proposed development of the Harbour facilities with the Mine, the three MTS Intermediate Shaft Sites and the Construction Village and P&R. The MTS Portal and the MHF were ‘scoped out’ of the EIA for amenity and recreation because the proposed works are located on privately owned land (the Wilton Industrial Complex) and the Wilton site does not contain any recreation facilities, include any access routes (footpaths) or provide any recreational opportunities. In addition, no cumulative impacts were predicted with regard to other plans and projects.

3.12 Marine environment

3.12.1 With regard to the marine environment, the cumulative impact on marine water quality due to an increased suspended sediment concentration arising from capital dredging for other projects (should they coincide with the dredging for the Harbour facilities) was predicted to be of minor adverse significance (temporary increases in peak concentration above those normally experienced). The effect would be additive, with an overall combined increase in suspended sediment concentration where the sediment plume from more than one projects overlap. However, the cumulative impact on fish populations as a result of this effect is predicted to be of negligible significance (because they would only exhibit one avoidance reaction).

3.12.2 The cumulative impact on water quality due to maintenance dredging for the Harbour facilities with the wider maintenance dredging programme in the Tees estuary was also predicted to be of negligible significance, given the very small change in the overall fine sediment regime predicted (i.e. redistribution only).

3.12.3 The dispersion of suspended sediment and deposition on the seabed during capital dredging has the potential to affect benthic invertebrate communities due to smothering; however, the cumulative impact was predicted to be of negligible significance due to the low magnitude of the effect and its temporary nature.

3.12.4 The cumulative impact on the hydrodynamic and sedimentary regime of the Tees estuary was predicted based on results of modelling studies undertaken for the other projects scoped into the CIA. It was concluded that there would be no cumulative impact on the sediment budget given that the YPP would not change the sediment supply to the Tees estuary or result in an overall increase in the maintenance dredging requirement within the Tees. Based on this conclusion, no cumulative impact on intertidal areas was predicted (i.e. erosion or accretion) and, therefore, no cumulative impact on intertidal benthic invertebrate communities or habitats available for feeding waterbirds.

3.12.5 Whilst a cumulative impact of major adverse significance could be predicted for disturbance to marine mammals and fish due to underwater noise generated during construction works, the adoption of suitable mitigation measures (e.g. timing restrictions) would reduce this potential cumulative impact to a residual cumulative impact of minor adverse significance.

3.12.6 The potential cumulative impact on commercial navigation was assessed with respect to the potential impact during marine construction works. Relevant management measures would be applied to any marine construction works in order to manage the risk to navigation and it is predicted that the cumulative impact would be of negligible significance. Operational phase cumulative impacts (i.e. implications for vessel traffic management) are also predicted to be of negligible significance and all vessel traffic would continue to be effectively managed and controlled by the VTS.

4 WATER FRAMEWORK DIRECTIVE COMPLIANCE

4.1.1 The Water Framework Directive (Council Directive 2000/60/EC) was transposed into law in England and Wales in 2003. The WFD requires that all EU Member States must ensure that new schemes do not adversely impact upon the biology, hydrology, geomorphology and chemistry of all rivers, lakes, estuaries, coastal waters and groundwater.

4.1.2 A detailed assessment was undertaken to determine whether the proposed Harbour facilities have the potential to impact upon surface waters and groundwater bodies in the study area. At the outset it was determined that they have.

4.1.3 The construction of the proposed conveyor and temporary construction compound have the potential to impact WFD compliance parameters via the release of sediment laden surface water or surface water contaminated by accidental spills. However, the magnitude of these impacts can be reduced significantly by the implementation of suitable mitigation measures (e.g. prevention of the rapid release of surface water flows through good site drainage design; adoption of Environment Agency Pollution Prevention Guidance; use of soft start piling techniques; and use of an enclosed grab for dredging contaminated sediments). Therefore, the residual impact is unlikely to be sufficient to cause deterioration in the hydromorphological and associated biological quality elements of the Tees Estuary (S Bank) Area surface water body.

4.1.4 The proposed development also has the potential to alter a number of WFD compliance parameters within the Tees estuary transitional water body, e.g. due to temporary deterioration in physico-chemical parameters, but the main potential impacts would be controlled by design and are unlikely to be significant in the long term.

4.1.5 Similarly, the proposed scheme is not likely to result in any significant groundwater impacts and would not cause deterioration in the status of the Tees Mercia Mudstone & Redcar Mudstone groundwater body, or prevent good status being achieved in either of these water bodies in the future.

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5 HABITATS REGULATIONS ASSESSMENT

5.1.1 A HRA has been undertaken for the proposed Harbour facilities in line with the requirements of the Conservation of Natural Habitats and Species Regulations 2010 (as amended).

5.1.2 The HRA provides information to enable 'screening' of the Harbour facilities alone and in combination with other plans and projects (including the other elements of the YPP insofar as they are relevant to the HRA) with respect to its potential to have a Likely Significant Effect (LSE) on European sites (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)) and Ramsar sites. In this context LSE is any effect that may be reasonably predicted as a consequence of the Harbour facilities (alone and in combination) that could adversely affect the conservation objectives of the qualifying features for which a site is designated, but excluding trivial or inconsequential effects.

5.1.3 The screening stage concluded that the Harbour facilities and MHF have the potential to have a significant effect on the Teesmouth and Cleveland Coast SPA and Ramsar site, with respect to habitat loss, water quality, disturbance and the potential alteration of coastal processes. The screening stage also concluded that in combination effects could arise for the Harbour facilities with other projects, including the MHF, NGCT, QEII Berth Development, maintenance dredging within the Tees estuary and the Tuned in! arts and media centre.

5.1.4 The above designated sites and other plans and projects were, therefore, taken forward into the 'Appropriate Assessment' for the Harbour facilities. That is, the potential impacts identified were considered in the context of the defined conservation objectives for the relevant qualifying features / criteria and a view was given on whether the Harbour facilities would have an adverse effect on the integrity of the SPA and Ramsar site, alone and in combination with other plans and projects.

5.1.5 It was determined that the proposed Harbour facilities would not directly affect habitats used by waterbirds within the boundary of the Teesmouth and Cleveland Coast SPA and Ramsar site; all proposed works are located outside the boundaries of the designated sites.

5.1.6 The predicted effects of the proposed port terminal and capital dredging on the hydrodynamic and sedimentary regime (which have the potential to indirectly affect habitats within the designated sites) during the operational phase were demonstrated to be of a localised nature and a low magnitude; with no effect on the supply of sediment to intertidal areas within the Tees estuary or wider coastal processes predicted.

5.1.7 The proposed Harbour facilities would have a direct effect on a habitat, outside the designated sites, used by waterbirds which form part of the SPA population; that is, the intertidal footprint of the proposed quay. While this area is used by greater than 1% of the population (measured by the Tees WeBS site counts) for some species of waterbird (i.e. shelduck, redshank and turnstone on the river frontage), the total number of birds and species supported by this area is low and the area is not considered to be integral to the structure and function of the designated sites.

5.1.8 Nevertheless, habitat enhancement measures in Bran Sands lagoon are proposed. It is concluded that these measures would provide a significant net benefit to waterbird populations and make a contribution to the functioning of the SPA and Ramsar site.

5.1.9 Two areas in close proximity to the proposed Harbour facilities (Dabholm Gut and Bran Sands lagoon) are demonstrably of importance to the structure and function of the designated sites. It is concluded that the proposed scheme does not have the potential to have a significant effect on the habitats within these areas because any direct works would be minimal (restricted to a small number of supports for the conveyor). However, there would be impacts on waterbirds feeding and roosting in the lagoon and, to a lesser extent, Dabholm Gut. The most significant potential effect would be noise disturbance during the construction works, particularly during piling for the quay construction and conveyor when birds would redistribute away from the noise source. This potential impact would be mitigated through the use of acoustic barriers, which would also act as a screen to personnel movements during construction, and the potential use of noise reduction curtain over the hammer piling rig during percussive operations for the quay. Based on the implementation of these measures, these effects are not predicted to have the potential to have an adverse effect on the waterbird population of the SPA and Ramsar site.

5.1.10 Visual disturbance due to lighting (in construction and operation) is also likely to arise. However the lighting scheme would be specifically designed to avoid adversely affecting waterbirds that feed and roost at Bran Sands lagoon and Dabholm Gut.

5.1.11 Water quality in Bran Sands lagoon is currently in compliance with the requirements of the Environmental Permit and it is considered that there is no mechanism whereby the habitat enhancement proposals could have an impact of any significance on existing water quality conditions. Monitoring of water quality in the lagoon would continue in the future in accordance with the requirements of the Environmental Permit and Closure Plan.

5.1.12 In conclusion, in the context of the conservation objectives of the Teesmouth and Cleveland Coast SPA, it is predicted that the proposed Harbour facilities alone would not affect the structure and function (the integrity) of the SPA. On the basis of the information presented in the HRA, it is further concluded that the proposed Harbour facilities (alone) would not affect the structure or function of the Ramsar site.

5.1.13 It is also concluded that the proposed Harbour facilities, when assessed in-combination with other relevant projects, would not result in an adverse effect on the integrity of the SPA or the Ramsar site.

6 CONCLUSION

6.1.1 The ES has reported on the diverse range of local, regional and national assets present in the study area and provides details of the assessment of potential impacts resulting from the construction, operation and decommissioning phases of the proposed Harbour facilities.

6.1.2 The EIA, its findings and the outcomes of the consultation process have been integral to the iterative design of the Harbour facilities. Where possible mitigation has been designed in to the project to prevent or minimise potential adverse impacts. The EIA has also identified the potential for enhancements. In summary, key findings of the EIA for the Harbour facilities include:

- The provision of economic opportunities for the area with a peak of 175 people on-site during the construction phase of the Harbour facilities.
- No significant impact upon the hydrodynamic and sedimentary regime of the Tees estuary, and no indirect effect on intertidal areas during the operational phase.
- No significant impacts upon marine or terrestrial ecological receptors.
- No significant impacts on traffic and transport, air quality, noise and vibration or commercial navigation due to either the construction or operational phases.
- An impact of negligible significance on coastal protection and flood defence.
- A low risk to existing infrastructure through appropriate design of the conveyor system, extensive consultation with owners and operators and the drafting of Protective Provisions.
- No significant impact upon landscape character, though adverse impacts on existing views are predicted from residential areas, the A1085 and from some PRoW during the construction, operation and decommissioning phases of the scheme. Mitigation measures would be employed to minimise adverse impacts, though the presence of the raised conveyor structure as a new element within available views would remain through the operational phase.
- Under the requirements of the Water Framework Directive the proposed Harbour facilities would not cause deterioration in the status of any water body or prevent good status being achieved in relevant water bodies in the future.
- The HRA predicted that the proposed Harbour facilities, both alone and in combination, would not affect the structure and function (the integrity) of the Teesmouth and Cleveland Coast SPA or Ramsar site.

6.1.3 From the above it is clear that it was identified that the Harbour facilities would have a variety of impacts, not all of which would be adverse and significant but, for those that would be, the EIA process identified mitigation measures to avoid such impacts where possible. The EIA also highlighted where, with the right management, the proposals would have positive benefits as well, for example in long-term job creation and biodiversity enhancements from the habitat enhancement proposals within Bran Sands lagoon.

6.1.4 For a full report of the EIA process, its findings and the Harbour facilities proposals, please refer to the ES; available on the Planning Inspectorate's website.