FOREWIND

DOGGER BANK
TEESSIDE A & B

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2014

Environmental Statement Chapter 12 Appendix A Tranche B and Export Cable Corridor Benthic Survey Report

Application Reference 6.12.1

FOREWIND LTD

DOGGER BANK OFFSHORE WIND FARM

TRANCHE B AND TEESSIDE CABLE CORRIDOR BENTHIC SURVEY

JULY - NOVEMBER 2012

ENVIRONMENTAL CHARACTERISATION REPORT

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EXECUTIVE SUMMARY

Gardline Environmental Ltd (GEL) carried out a benthic characterisation survey for Forewind Ltd (hereafter referred to as Forewind) throughout Tranche B and the associated Teesside Cable Corridor (TCC) routes (Northern and Southern) for the Dogger Bank Offshore Wind Farm (OWF) Project. Forewind aims to develop a series of wind farms on Dogger Bank in four stages known as tranches (Forewind, 2012a). Survey work for Tranche B was conducted during July 2012 onboard the *MV Vigilant* with the survey of TCC routes conducted during September 2012 and October 2012 onboard the *MV Vigilant* for the offshore section and during November 2012 on the *MV Titan Endeavour* for the inshore section of the route.

This characterisation survey was undertaken to feed into the Environmental Impact Assessment (EIA) process to inform the Environmental Statement (ES). The report will contribute to a zone-wide characterisation of Dogger Bank investigating physical sediment characteristics, sediment contaminants and benthic community composition throughout Tranche B and the TCC routes.

Within Tranche B, a total of 55 stations were pre-selected by the Client to undertake camera investigation of the habitat and grab sampling for particle size and faunal analyses, 11 of which were also to be sampled for contaminant analyses. Along the TCC routes, 120 stations were pre-selected for camera investigation, of which 74 were selected for grab sampling for particle size and faunal analyses, including 24 stations for contaminant analyses. Camera operations utilised a digital stills camera and video system with a freshwater lens in order to ground truth the geophysical survey data and to investigate the survey areas for the presence of features of conservation importance. A modified mini-Hamon grab was used to acquire one 0.1m^2 sample at each station, with a sub-sample also taken for particle size analysis (PSA). One 0.1m^2 grab sample was acquired at all but four of the 55 Tranche B sampling locations and three of the 74 TCC sampling locations. A Day grab was used to acquire two 0.1m^2 samples at each station specified for contaminant sampling. Two 0.1m^2 Day grab samples were acquired at all of the 11 Tranche B sampling locations and all bar three of the 24 TCC sampling locations.

The Tranche B survey area falls within the Dogger Bank candidate Special Area of Conservation (cSAC), which is listed as such partly due to the presence of sandbanks which are slightly covered by sea water all the time. This Annex I habitat is protected under the UK's Offshore Marine Conservation (Natural Habitats &c.) (Amendment) Regulations 2010, which implement the EC Habitats Directive 92/43/EEC. The cSAC boundary, together with the locations of known sandbanks, in relation to the survey area is shown on the Location Map, page viii. Several areas of high reflectivity were identified on the sidescan sonar (SSS) data, indicating coarse sediments with the potential for Annex I 'stony reef' habitats, were identified. Nine transects within Tranche B and two transects along the TCC routes were proposed to allow for a more detailed assessment for potential Annex I 'stony reefs'.

Tranche B Results

Water depths across Tranche B ranged from 21.5m lowest astronomical tide (LAT) in the east to 38.5m LAT in the north. Areas with depths greater than 35m LAT occurred in the central northern area and in the west of Tranche B, comprising a series of elongated gullies, orientated northwest-southeast, up to 6m deep, where gradients reached up to 6° along their edges. Gradients across the rest of the seabed were generally less than 3°. The seabed sediments were interpreted as predominantly sand with scarce patches of coarse sand and gravel with megaripples. Frequent exposures of boulder clay/till within erosional features such as gullies and depressions were also observed, with accumulations of coarse sand and gravel within depressions.

Sediment composition across Tranche B, defined by grab sampling, was broadly uniform and confirmed the geophysical interpretation of the seabed. The majority of stations were described as moderately well to well sorted fine sand under the Wentworth classification system. Poorly sorted sediments were classified under Modified Folk as gravelly sand, sandy gravel and gravel. Highest fines (<63µm) were found at Stations TB_37 and TB_53 (3.7% and 7.2% respectively) with all other stations recording fines of ≤1.9%. Gravel (>2mm) dominated the sediments at Stations TB_30, TB_48, TB_50 and TB_53, ranging from 72.1% to 93.3%. Stations with high proportions of gravel were identified on the seabed features chart as areas of coarse sand or boulder clay with boulders, cobbles and patches of sand. Total organic carbon (TOC) was below the limit of detection (LoD) at all 11 sampled stations across Tranche B.

Grab samples taken for contaminant analyses were analysed for total hydrocarbon and polycyclic aromatic hydrocarbon (PAH) concentrations, metals and metalloid concentrations, polychlorinated biphenyls (PCBs) and organotins. Total hydrocarbon concentrations (THC) varied between 0.100mg kg^{-1} at Station TB_40 and 0.930mg kg^{-1} at Station TB_19. Individual hydrocarbon and PAH concentrations were below background levels, where available (Long *et al.,* 1995; Canadian Council of Ministers of the Environment; CCME), 1999). Manganese was above its Apparent Effect Threshold (AET; Long *et al.,* 1995) at Stations TB_04, TB_17, TB_19 and TB_36. All other metals were below their respective threshold values at all stations, with the exception of Station TB_17, where chromium, copper and nickel were slightly elevated. PCBs and organotins were below their respective LoDs at all stations across Tranche B, and considered representative of the wider area of the North Sea.

Univariate analyses revealed a taxonomically diverse and species rich faunal community which was dominated by polychaete annelids, accounting for 63% of all individuals and 38% of all taxa. The polychaete *Spiophanes bombyx* was observed as the most abundant species. The dominant species observed within Tranche B are characteristic of fine to medium sands and muddy sands and are commonly found in the North Sea. Higher diversity and lower dominance structures were generally observed in the centre of Tranche B, coinciding with areas of increased seabed complexity. Multivariate analyses indicated that there was a change in faunal community at areas of boulder clay exposure, characterised by encrusting polychaetes such as *Spirobranchus lamarcki* and *Spirobranchus triqueter*.

Biotope classification was undertaken to European Nature Information System (EUNIS) Level 4 and Level 5 where possible. Stations classified to EUNIS Level 4 were determined as circalittoral fine sand (A5.25, n=27), circalittoral mixed sediment (A5.44, n=5), circalittoral coarse sediment (A5.14, n=2) or as a mosaic of circalittoral fine sand and circalittoral coarse sediment (A5.25/A5.14, n=15). Stations classified to EUNIS Level 5 were determined as *Abra prismatica, Bathyporeia elegans* and polychaetes in circalittoral fine sand (A5.252, n=4) and *Pomatoceros triqueter* (now *Spirobranchus triqueter*) with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles (A5.141, n=2). A small number of *Arctica islandica*, a species listed by OSPAR (2008) as under threat and/or in decline in the North Sea were identified. Five additional camera transects identified areas with low resemblance to 'stony reef' and two transects identified areas with medium resemblance to 'stony reef'. Apart from the potential for Annex I reef habitat at these locations, there was no indication from the acoustic data, seabed imagery or seabed sampling within the Tranche B survey area of any other Annex I habitats protected under the UK's Offshore Marine Conservation (Natural Habitats, &c.) (Amendment) Regulations 2010, which implements the EC Habitats Directive 92/43/EEC.

Teesside Cable Corridor Results

Water depths along the TCC Northern Route ranged from 0.9m LAT to 88.2m LAT with a maximum gradient of 36.0°. Along the TCC Southern Route, water depths ranged from 1.0m LAT to 82.1m LAT with a maximum gradient of 18.8°. Significant gradients occurred in areas of outcropping mudstone bedrock. In general, seabed sediments were predicted to vary from slightly gravelly sand to sandy gravel depending on the influence of the underlying geology. Outcrops of mudstone dominated large sections of both routes with a veneer of slightly gravelly sand observed between outcrops. Occasional exposures of till were also observed throughout both routes.

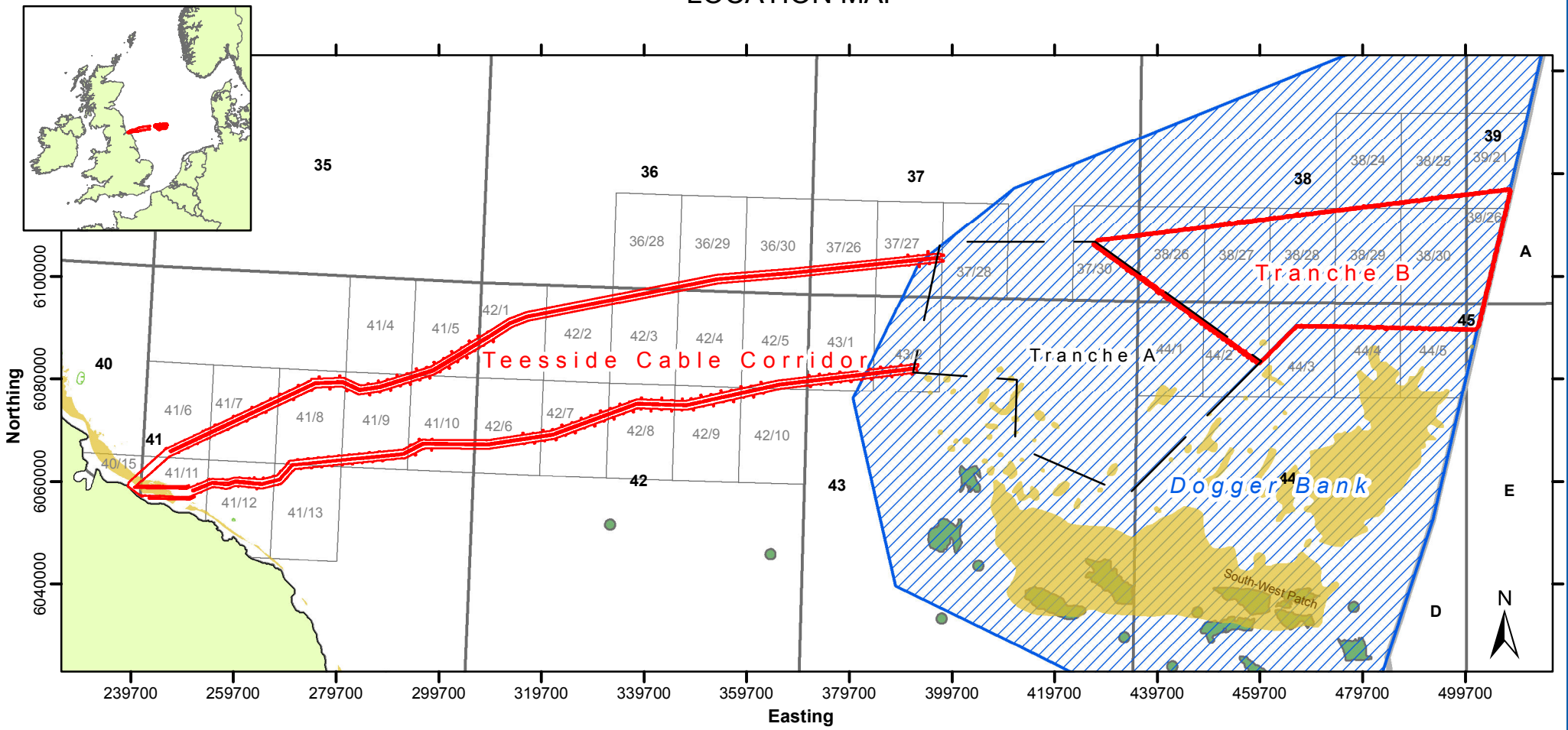
The majority of TCC stations were dominated by sand sized particles with relatively low fines and gravel content. Fine material dominated at the nearshore Station TCC_09 (62% fines), resulting in a Modified Folk classification of slightly gravelly sandy mud. High fines were also found at Stations TCC_06, TCC_10, and TCC_71 with fines contents ranging from 20.7% to 35.3%. These stations were classified as slightly gravelly muddy sand and gravelly muddy sand. Fines at all other stations ranged from 0.8% to 13.1%. Gravel dominated the sediments at Stations TCC_76 (61.5%) in the west and TCC_115 (64.8%) in the east section of the southern route, resulting in Modified Folk classifications of muddy sandy gravel and sandy gravel, respectively. High gravel content was also found at Stations TCC_12, TCC_14, TCC_16 in the west section of the northern route, TCC_53, east section of northern route and TCC_75, west section of the southern route, ranging from 23.1% to 43.1% gravel. These stations with high proportions of poorly sorted gravelly sediments were consistent with areas of gravelly sand or gravelly sand with outcropping rock or till delineated on the seabed features. TOC ranged from <0.4% at Station TCC_114 to 4.60% at Station TCC_10. Stations with the highest TOC across the survey area also recorded the highest proportions of fine sediment, suggesting variations of TOC concentrations due to natural variations in the physical properties of the sediment.

Grab samples were analysed for THC, PAH, metals and metalloid concentrations as well as PCBs and organotins. THC varied between 4.03mg kg^{-1} at Station TCC_114 and 1590mg kg^{-1} at Station TCC 10. Stations TCC_06, TCC_09, TCC_10 and TCC_112 recorded the highest hydrocarbon and PAH concentrations and presented several individual PAH concentrations above the Effect Range Low (ERL) as well as the Probable Effect Levels (PEL; Long *et al.*, 1995; CCME, 1999). Arsenic, chromium, copper, lead and zinc were at concentrations above background thresholds in at least one sample, with all but arsenic reported at least one sample at concentrations above their Effect Range Median (ERM), Action Level 2 (AL2) or PEL (Long *et al*., 1995; CEFAS, 2003; CCME, 1999). PCBs and organotins were below their LoD at all stations, with the exception of PCBs at Stations TCC_09 and TCC_10. The highest concentrations of total hydrocarbons, PAHs, metals, and PCBs were largely observed at the nearshore Station TCC_10, corresponding with the highest proportions of fines. This pattern suggested natural variation of these concentrations following the physical sediment properties.

Univariate analyses revealed a taxonomically diverse but variable faunal community along the TCC routes. The community was dominated by polychaete annelids, accounting for 52% of all individuals and 43% of all taxa. Similar to the Tranche B survey, the polychaete *S. bombyx* was observed as the most abundant species. Other dominant species included the polychaete *Galathowenia oculata* and the juvenile Ophiuroidea. Multivariate analyses indicated that the faunal community was variable across the routes, with stations closest to shore distinct from all others, notably due to the abundance of the polychaete *Magelona johnstoni* and juvenile *Nephtys* together with the mollusc *Angulus fabula*. Changes in the faunal community appeared to be due to the variation in the abundance, presence or absence of numerous taxa, rather than the presence of any one dominant taxa.

Biotope classification was undertaken to European Nature Information System (EUNIS) Level 4 and EUNIS Levels 5 and 6 where possible. Stations classified to EUNIS Level 4 were determined as kelp and red seaweeds on moderate energy infralittoral rock (A3.21; n=2), infralittoral fine sand (A5.23; n=5), infralittoral muddy sand (A5.24, n=1), circalittoral coarse sediment (A5.14, n=14), circalittoral fine sand (A5.25, n=49), circalittoral muddy sand (A5.26, n=13), circalittoral sandy mud (A5.35, n=2), circalittoral mixed sediment (A5.44, n=5), or as a mosaic of circalittoral fine sand and circalittoral coarse sediment (A5.25/A5.14, n=11). Stations classified to EUNIS Level 5 were determined as *Abra prismatica, Bathyporeia elegans* and polychaetes in circalittoral fine sand (A5.252, n=1) and faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock (A4.214, n=6). Ten stations were classed as a mosaic of circalittoral coarse sediment with faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock (A5.14/A4.214). A small number of *A. islandica*, a species listed by OSPAR (2008) as under threat and/or in decline in the North Sea were identified. One camera transect (TB_TRAN_33) identified an area with low resemblance to ‘stony reef’. Stations TCC_01, TCC_03, TCC_05 on the TCC Northern route and Stations TCC_61, TCC_62 and TCC_64 on the TCC Southern route have been highlighted as potential Annex I sandbank habitats as all six stations occur in fine sandy sediments in less than 20m of water.

LOCATION MAP



Key

- Proposed Teesside Cable Corridor and Tranche B Survey Areas
- Tranche A Area
- Submitted UK Offshore SACs (JNCC, 2012)
- Areas of potential Annex 1 sandbank habitat (Areas of sandy sediments according to the BGS) In water depth 20m <LAT, (Johnston, *et al.*, 2002)
- Potential Stony Reef
- Gas Field (UKDEAL, 2012)

Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E

Kilometres
0 10 20 30 40

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GLOSSARY OF TERMS AND ABBREVIATIONS

AET	Apparent Effects Threshold
Anthropogenic	Produced or caused by human activity
ASE	Accelerated Solvent Extraction
Benthic	Relating to the seabed
BGS	British Geological Survey
Biogenic	Produced by living organisms
BSI	British Standards Institute
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
Clay	Sediment grains <3.9µm in diameter
CONTEST	Contaminated land scheme
CRM	Certified Reference Materials
cSAC	Candidate Special Area of Conservation
DGPS	Differential Global Positioning System
EEA	European Environment Agency
EI	Electron Ionisation
EIA	Environmental Impact Assessment
ERL	Effects Range Low
ERM	Effects Range Median
ES	Environmental Statement
EUNIS	European Nature Information System
Fines	Sediment grains <63µm in diameter (same as Mud)
GC	Gas Chromatography
GC-MS	Gas Chromatography Mass Spectrometry
GEL	Gardline Environmental Limited
GGL	Gardline Geosurvey Limited
GPC	Gel Permeation Chromatography
Gravel	Sediment grains >2mm in diameter
ICP-OES	Inductively Coupled Plasma Optical Emission Spectrometry
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
ISQG	Interim Sediment Quality Guidelines
JNCC	Joint Nature Conservation Committee
KP	Kilometre Point
LAT	Lowest Astronomical Tide
LGC	Laboratory of Government Chemists
LoD	Limit of Detection
Macrofauna	Organisms that are normally larger than the 1mm mesh size of the sieve used.
MBES	Multi-beam Echo Sounder
MDS	Multi Dimensional Scaling
MES	Marine Ecological Surveys
MS	Mass Spectrometer
Mud	Sediment grains <63µm (includes Silt and Clay)
NLS	National Laboratory Service
NMBAQC	National Marine Biological Association Quality Control
OSPAR	Oslo and Paris convention
OWF	Offshore Wind Farm
PAH(s)	Polycyclic aromatic hydrocarbon(s)
PCB(s)	Polychlorinated biphenyl(s)
PEL	Probable effect Level
PRIMER	A statistical analysis program - Plymouth Routines in Multivariate Research
PSA	Particle Size Analysis
QA	Quality Assurance
QC	Quality Control
Sand	Sediment grains >63µm and <2mm in diameter
SBES	Single-beam echo sounder
SD	Standard deviation
SETOC	Sediment Sample Exchange and Organic Parameters
Silt	Sediment grains >3.9µm and <63µm in diameter
SIM	Selected Ion Monitoring
Sorting	Measure of the range of grain sizes in a sediment sample
SSS	Sidescan Sonar
SSSI	Sites of Special Scientific Interest
TBT	Tributyltin
TCC	Teesside Cable Corridor
TCE	The Crown Estate
THC(s)	Total Hydrocarbon Concentration(s)
TOC	Total Organic Carbon
UKBAP	United Kingdom Biodiversity Action Plan
UKDEAL	United Kingdom Digital Energy Atlas and Library
USBL	Ultra Short Base Line
UTM	Universal Transverse Mercator
UVF	Ultra Violet Fluorescence
WGS84	World Geodetic System 1984

1 INTRODUCTION

1.1 Overview

Dogger Bank is one of nine offshore wind energy development zones identified by The Crown Estate (TCE) under the Round 3 licensing process for UK offshore wind farms. In January 2010, Forewind Ltd (a consortium comprising RWE, SSE, Statkraft and Statoil), hereafter referred to as Forewind, was announced as development partner for Dogger Bank. The Dogger Bank Zone is the largest of the Round 3 zones, covering an area of approximately 8660km^2. As development partner for the Dogger Bank Zone, Forewind has the objective to achieve development consent for an agreed target installed capacity of 9GW of offshore wind farm projects by 2020 (TCE, 2012). This equates to 10% of the UK's projected electricity requirements. If fully developed, it is likely to be the world's largest offshore wind project.

To ensure that the work associated with meeting this objective is managed effectively, and to more evenly distribute demands on stakeholders and the supply chain, Forewind has proposed to develop the zone sequentially in four stages known as tranches (Forewind, 2012a). Within each tranche (presented on the Location Map; page viii), Forewind aims to develop a series of wind farm projects, each with a capacity of up to 1.2GW. Tranche A was identified in 2010 and Tranche B identified in 2011, with Tranches C and D to be finalised at a later stage (Forewind, 2012a). The survey of Tranche A (Dogger Bank Creyke Beck) and its associated cable corridor to landfall was successfully completed in 2011 (Forewind, 2012b; EMU, 2012).

Development of Tranche B (Dogger Bank Teesside) will consist of two wind farm projects (Teesside A and Teesside B), connected via export cables to substations at Teesside. Cable routes have been identified for Teesside A and B (Southern route in the current survey), while the Northern route has been identified for future projects within Tranche C. The Dogger Bank Zone is situated in the North Sea, between 125km and 290km off the east coast of Yorkshire, with its outer limit aligned to the UK continental shelf. Although it is the largest of the Round 3 zones extending over approximately 8660km^2, the Dogger Bank Zone is also one of the shallowest, with water depths ranging between 18m and 63m LAT.

1.2 Survey Summary

In 2012, Gardline Environmental Ltd (GEL) carried out a benthic characterisation survey for Forewind throughout Tranche B and the associated Teesside Cable Corridor (TCC) routes (Northern and Southern). The survey of Tranche B was conducted during July onboard the *MV Vigilant*, with the survey of the TCC routes conducted during September and October onboard the *MV Vigilant* for the offshore section and during November on the *MV Titan Endeavour* for the inshore section of the route.

A zone-wide characterisation of Dogger Bank is currently being carried out to provide Forewind with a greater understanding of the environmental, engineering and economic constraints to development within the wider zone and to identify boundaries within which individual and/or multiple projects can be developed (Forewind, 2012b). This report will contribute to the characterisation programme; investigating physical sediment characteristics, sediment contaminants and benthic community composition throughout Tranche B and the associated TCC routes. This characterisation survey was undertaken to feed into the Environmental Impact Assessment (EIA) process to inform the Environmental Statement (ES).

The environmental surveys were carried out following geophysical surveys conducted by Gardline Geosurvey Ltd (GGL) between June 2011 and May 2012 in Tranche B and from May 2012 to July 2012 along the TCC routes. The aim of these surveys was to carry out a geophysical investigation that would assess bathymetry, seabed features and sub-surface features to inform environmental and seabed construction processes. These surveys utilised single-beam and multi-beam echo sounder (SBES and MBES), sidescan sonar (SSS), pinger, sparker and magnetometer equipment. The results of the geophysical surveys have been summarised in this report where relevant, but given in more detail in separate reports (GGL, 2012a and 2012b).

Within Tranche B, a total of 55 stations were pre-selected by the Client to undertake camera investigation of the habitat and grab sampling for particle size and faunal analyses, 11 of which were also to be sampled for chemical analyses. Along the TCC routes, 120 stations were pre-selected for camera investigation, of which 74 were selected for grab sampling for particle size and faunal analyses, including 24 stations for chemical analyses.

Camera operations utilised a digital stills camera and video system with a freshwater lens in order to ground truth the geophysical survey data and to investigate the survey areas for the presence of features of conservation importance. These include potential Annex I habitats, which may be protected under the EC Habitat's Directive, as implemented by the UK's Offshore Marine Conservation (Natural Habitats, &c.) (Amendment) Regulations 2010, such as biogenic reefs or stony/rocky reefs and sand banks in less than 20m of water. Areas of high reflectivity identified from the geophysical data and areas of coarse sediment observed in seabed imagery were further investigated with camera transects in order to assess these areas for resemblance to potential stony reef.

A modified mini-Hamon grab was used to acquire one 0.1m^2 sample at each station, with a sub-sample also taken for particle size analysis (PSA). One 0.1m^2 grab sample was acquired at all bar four of the 55 Tranche B sampling locations and three of the 74 TCC sampling locations. Benthic faunal samples were screened on board through a 1mm sieve and preserved in buffered formalin. Two samples were obtained at each station designated for chemical analyses utilising a 0.1m^2 Day grab. Two 0.1m^2 grab samples were acquired at all bar three of the 24 TCC sampling locations. The sediment obtained was sub-sampled for analysis of hydrocarbon and trace metal content, as well as spares, each of which were frozen pending analysis.

All stations within Tranche B and the TCC were classified into biotope complexes (EUNIS Level 4; Connor *et al*., 2004). Further classification to Level 5 biotopes was attempted where possible, however the geographic disparity between seabed imagery and grab data prevented a more robust and consistent classification at this level.

All positional information in this report is referenced to the World Geodetic System 1984 (WGS84). All grid coordinates are projected using Universal Transverse Mercator (UTM) Projection, Grid Zone 31 North, 3° East. Details of the target and actual sampling locations of the pre-selected sampling stations and additional camera transects are presented in **Figure 1.1** and detailed in the Surveyors' log sheets in **Appendix A**. Actual sampling positions may be slightly offset from the target locations.

Figure 1.1 Target and Actual Environmental Sampling Locations - Tranche B

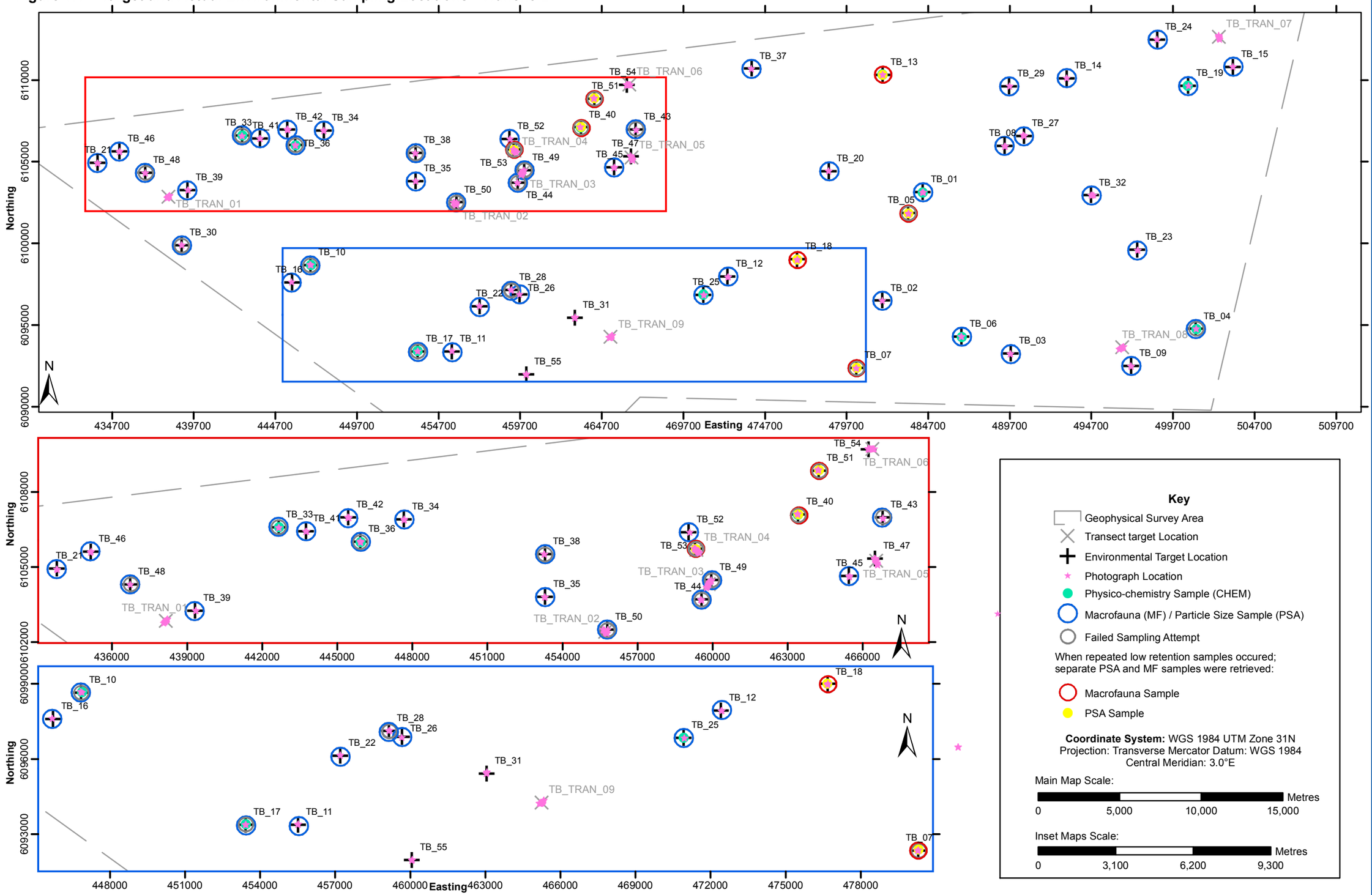


Figure 1.2a Target and Actual Environmental Sampling Locations - TCC Northern Route

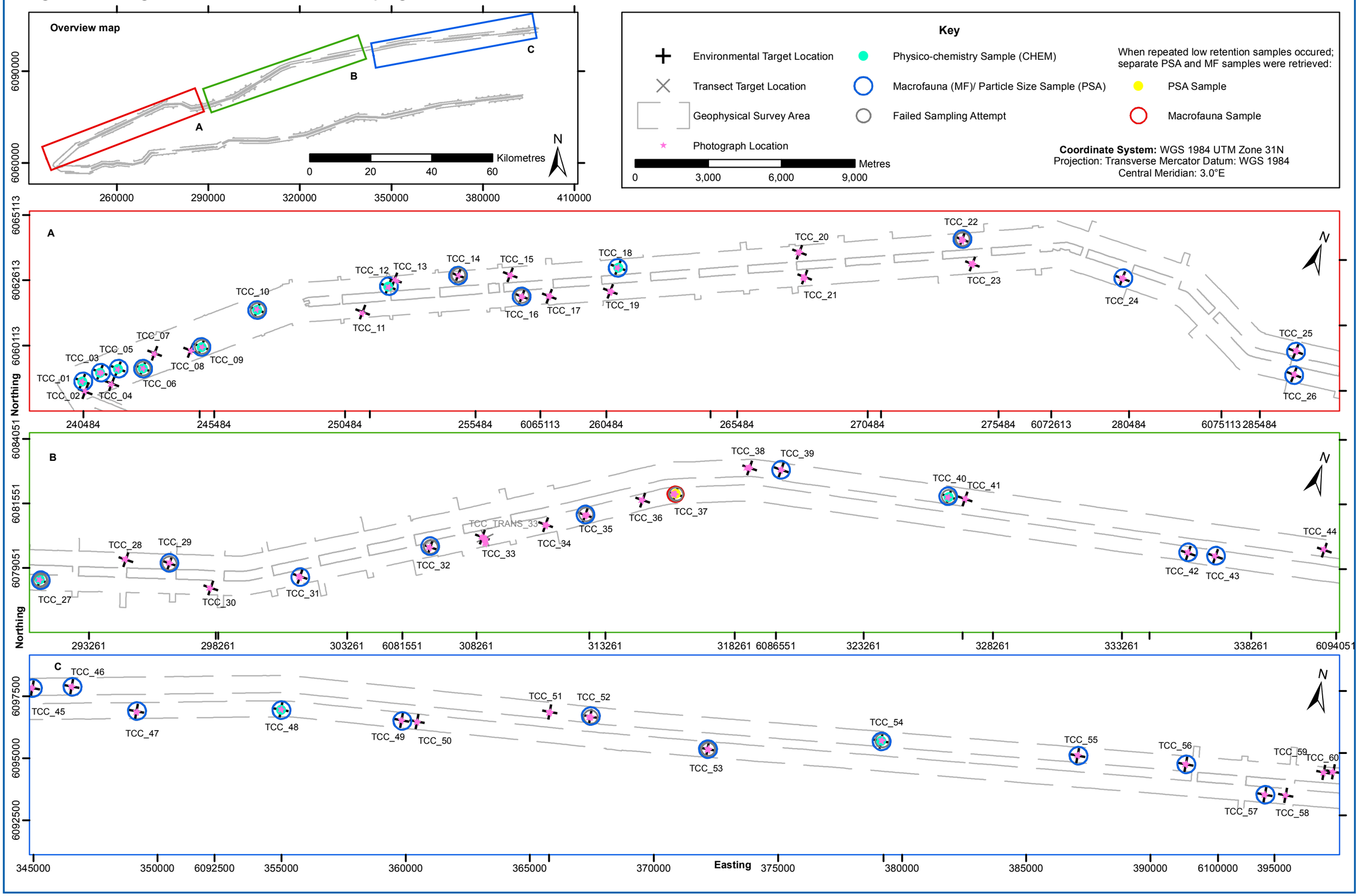
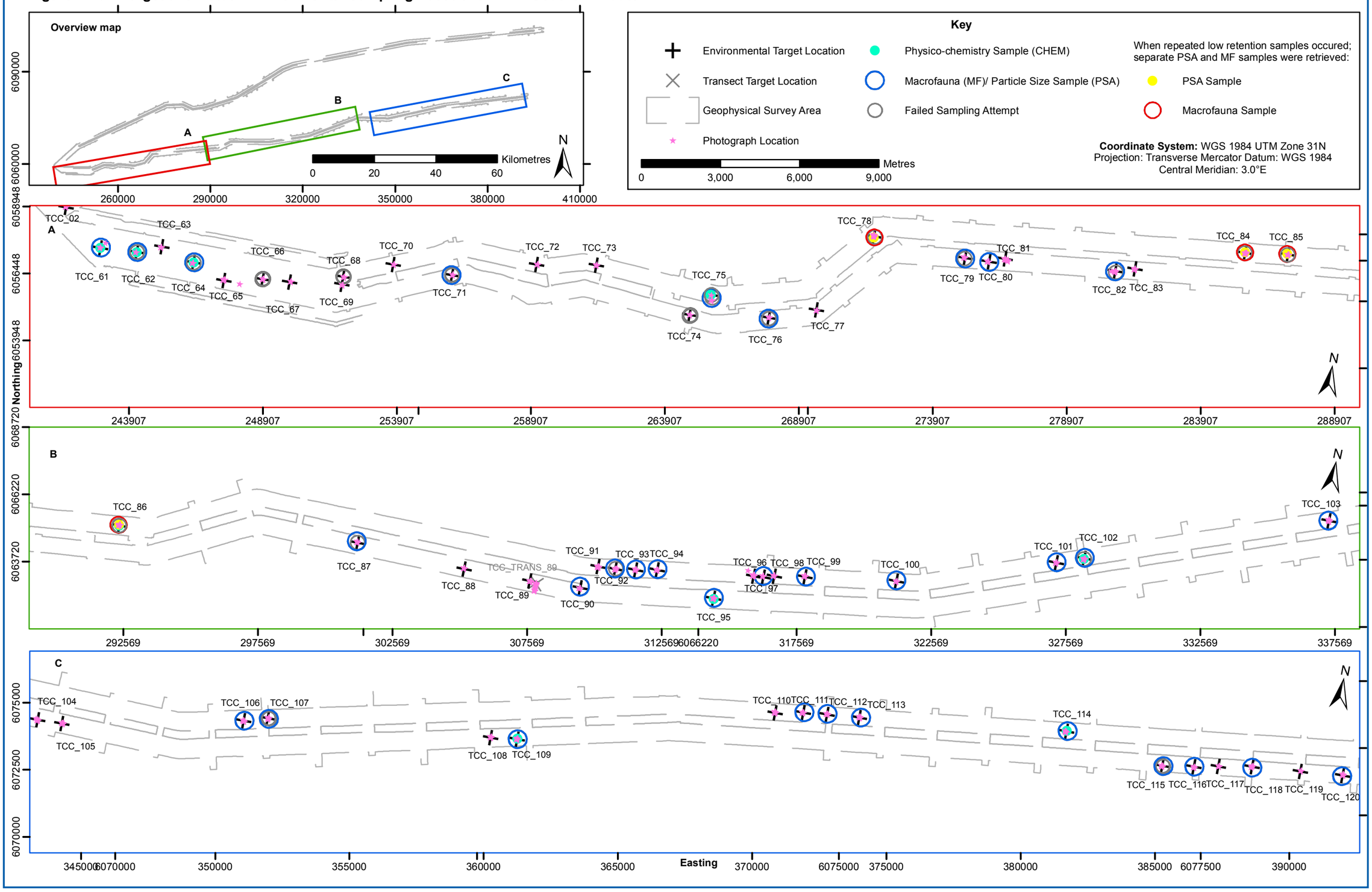


Figure 1.2b Target and Actual Environmental Sampling Locations - TCC Southern Route



2 METHODS

2.1 Camera Procedure

Environmental seabed images were taken by means of a digital stills camera system with a dedicated strobe and video lamps, mounted within a stainless steel frame. An ultra short base line (USBL) positioning beacon was attached to the camera frame. The USBL, an underwater positioning system, uses a vessel mounted transceiver to detect the range and bearing to the camera frame using acoustic signals. A full calibration of the system was carried out on the 24-Apr-2012 in accordance with Gardline standard operating procedures.

Footage was viewed in real time via an umbilical assisting in the control of the digital stills camera. This allowed for shot selection, in the event that the system recorded a sediment change or feature at the seafloor.

A minimum of five seabed photographs were taken at each station using a hover and drift technique, separated by a time gap of approximately 5-10 seconds. This technique allowed the frame to move progressively along the seabed as the vessel drifted across the work area or traversed on its thrusters. The images were captured remotely using the surface control unit and stored on the camera's internal memory card. Video footage was overlaid with time, position, and depth, and recorded directly onto VHS video and DVD. On completion, photographs were downloaded onto a PC via a USB download cable and copied onto CD-Rom. All CDs, DVDs and videos were labelled with the relevant job details, write-protected and stored.

Main instrumental and acquisition details are as follows:

Equipment	
Manufacturer	Kongsberg/Simrad.
Model	OE14-208
Pixels	5.0 M
Standard Lens	f 7.2 – 28.8 (35mm format equivalent to 38 – 140mm)
Focus Control	Automatic or manual 50mm to infinity
Trigger	Remote from deck
Height Control	USBL Beacon and Video footage
Video Overlay	Oceantools VO1
Field of View	47.8 (deg H) by 36.2 (deg V)
Lighting	1 strobe, 2 video lamp
Scale bar	1cm intervals

2.2 Seabed Sampling

2.2.1 Mini Hamon Grab Procedure

Seabed samples for PSA and macrofaunal analyses were recovered according to guidelines outlined in Ware and Kenny (2011), using an in-house constructed, modified, stainless-steel 0.1m^2 mini-Hamon grab. The grab carried extra weights to aid penetration on impact.

Mini Hamon grab sampling operational procedures were as follows:

The vessel's sampling area was pre-cleaned using a powerful deck fire-hose and seawater. A dry-core galvanised cable was used to lower the grab to the seabed.

For accuracy, the mini-Hamon grab was lowered to just above the seabed, then, using positioning information relayed from the surveyors or bridge, once directly over the target location the grab was lowered to the seabed and then quickly recovered. Positional fixes were captured immediately using differential global positioning system (DGPS) for each grab sample when the grab reached the sea floor. The precise time that the grab reached the seabed was determined by observations of the tension on the winch cable. On recovery of a sample, the grab would first be examined for acceptability following strict quality assurance (QA) criteria. In the following cases, a grab sample would be rejected and the instrument returned to the pre-deployment position:

1. jammed jaws due to a large stone or shell allowing sediment washout;
2. half sample obtained where the grab had not struck a flat area of bottom, or not hit true, causing a side or half bite of sediment;
3. disruption of the sample by obvious shaking or contamination (these can occur when a sample is badly handled or if the grab strikes the side of the vessel during operations);
4. the sample represents less than 5 litres or 40% of the grab's total capacity or totally filled the grab. The latter potentially allowing the sample to overflow the grab or for the surface sediments to come into contact with the lids;
5. sample was acquired more than 50m from the desired position (as determined by the onboard surveyors, environmentalist and Client Representative, with consideration of survey objectives);
6. the presence of a hag fish (*Myxine glutinosa*) and/or mucus coagulants.

Brief descriptions of the collected sediments were made at the time of sampling. Sediment colour was determined using Munsell colour charts. These were recorded in the environmentalist's log sheets and are presented in **Appendix A**. A selection of photographs, taken of the sediment samples whilst still in the Day grab, is presented in **Appendix B**.

Sediment samples were thoroughly washed from the grab into a plastic tray. A sub-sample was taken using a plastic scoop for PSA analysis and subsequently transferred to

an onboard freezer for storage at <-18°C. Once all of the equipment was washed free of sediment, the remaining sediment sample was transferred to a sieving machine where it was broken down using a low-powered seawater spray. All materials retained by the 1mm sieve were transferred to a squat jar or bucket by means of a scoop and funnel, making sure that none of the sample was lost or trapped in the mesh. The sample was fixed with a <20% formalin solution of known concentration, and buffered with borax, then subsequently diluted to a final concentration of approximately 4% formalin. Fauna samples were placed in 1 litre polypropylene screw-top squat jars, 5- or 10-litre buckets, depending on sample size, and provided with an additional internal waterproof label.

2.2.2 Day Grab Procedure

Seabed samples were recovered using an in-house constructed, modified, stainless-steel 0.1m^2 Day grab. The grab carried extra weights to induce better penetration on impact and an extended bucket lip to reduce sediment washout. Storm feet and elastic straps were used to reduce the likelihood of the instrument pre-triggering in the water column during deployment.

Grab sampling operational procedures were as follows:

The vessel's sampling area was pre-cleaned using a powerful deck fire-hose. The Day grab was thoroughly washed down using a diluted solution of Decon 90 prior to deployment at every station to prevent hydrocarbon cross contamination. A 125m-length of 10mm, dry-core, galvanised-steel cable was used to lower the Day grab to the seabed. Positional fixes were taken for each grab sample immediately following the grab reaching the sea floor and grab samples were examined following the same strict QA criteria outlined in Section 2.2.1 above.

Grab samples deemed acceptable under the QA criteria outlined above were photographed and described prior to sub-sampling. All containers for chemical analyses were labelled externally prior to use. Samples were placed in one metal tin (PAH), two glass jars (HC and spare), two 1kg plastic pots (marine sediment 1 and 2) and one zip-lock plastic bag (spare) and transferred to an onboard freezer for storage at <-18°C.

At the end of the survey all of the retained samples were delivered to GEL's Great Yarmouth office. All chemical sub-samples were kept frozen and biological samples stored at room temperature. Contaminant samples from each station were then sent frozen, in cool boxes kept cool with ice packs, along with biological samples, to their respective analytical sub-contractors (see Section 2.3). Spare samples are retained at GEL's Great Yarmouth office for at least six months after which time the Client is contacted to advise on appropriate disposal, continued storage or dispatch to a destination of the Client's choice.

2.3 Sample Analyses

Sediment and faunal samples were analysed by the following laboratories / persons:

- Sediment hydrocarbon, metals, organotin, selenium, boron, polychlorinated biphenyl (PCB) and total organic carbon (TOC) analyses were carried out by the National Laboratory Service (NLS) of the Environment Agency, Leeds, UK.
- Benthic macrofaunal identification was undertaken by Marine Ecological Surveys (MES), Bath, UK.
- PSA was carried out in-house by GEL.

The laboratories detailed above meet quality control requirements exacted by Gardline's internal procedures (BS/EN/ISO 9001:2008; BSI, 2008). NLS participates in the contaminated land scheme (CONTEST) and Aquacheck schemes administered by the Laboratory of Government Chemists (LGC) and take part in the Quasimeme proficiency testing scheme and in sediment sample exchange and organic parameters (SETOC). MES and GEL participate in the National Marine Biological Analytical Quality Control (NMBAQC) scheme.

2.4 Particle Size Analyses

PSA was undertaken in-house based on BS1377: Parts 1-3: 1990 (dry sieving). Sediments were homogenised and a sub-sample sample dried to constant weight. The sample was then weighed and wet sieved to 63µm under running water. The retained material was dried then separated using nested stainless-steel sieves with mesh apertures of 63mm, 31.5mm, 20mm, 16mm, 11.2mm, 8mm, 5.6mm, 4mm, 2.8mm 2mm, 1.4mm, 1mm, 710µm, 500µm, 355µm, 250µm, 180µm, 125µm, 90µm, and 63µm into a clean receiver. Each size fraction was weighed and the weights expressed as a percentage of the weight of the total sub-sample.

Using a second sub-sample, sediment particle size distributions below 63µm were determined using a Malvern Mastersizer 2000 particle sizer. No dispersants were used and the sediment was not treated to remove carbonates or organic matter prior to analysis. Mastersizer 2000 data have been previously independently validated by comparison to wet sieving (Hart, 1996).

The sediments were classified, statistics calculated and log sheets produced using the GRADISTAT program (Blott and Pye, 2001). The classification of sediments, using the modified Udden and Wentworth scale adopted in GRADISTAT is presented in **Table 2.1**. The sediment samples were also classified within GRADISTAT using the modified Folk triangle classification, which uses the sand:mud ratio and the percentage of gravel (**Appendix C**; Folk, 1954). It should be noted that GRADISTAT defines sediment with any trace of gravel as 'slightly gravelly'. This is in contrast with the traditional Modified Folk triangle which requires a minimum of 1% gravel to define 'slightly gravelly' sediment, but is

consistent with the previous Dogger Bank Offshore Wind Farm (OWF) Benthic Ecology Characterisation Report (EMU, 2012).

Table 2.1 Size scale and Classifications adopted in GRADISTAT

Aperture in mm	Aperture in Phi Unit	Sediment Description	
>1024	<-10	Very Large	Boulder
512 – 1024	-10 to -9	Large	
256 – 512	-9 to -8	Medium	
256 – 128	-8 to -7	Small	
128 - 64	-7 to -6	Very Small	
64 – 32	-6 to -5	Very Coarse	Gravel
32 – 16	-5 to -4	Coarse	
16 – 8	-4 to -3	Medium	
8 – 4	-3 to -2	Fine	
4 – 2	-2 to -1	Very Fine	
2 - 1	-1 to 0	Very Coarse	Sand
0.500 - 1	0 to 1	Coarse	
0.250 – 0.500	1 to 2	Medium	
0.125 – 0.250	2 to 3	Fine	
0.063 – 0.125	3 to 4	Very Fine	
0.031 – 0.063	4 to 5	Very Coarse	Silt
0.016 – 0.031	5 to 6	Coarse	
0.008 – 0.016	6 to 7	Medium	
0.004 – 0.008	7 to 8	Fine	
0.002 – 0.004	8 to 9	Very Fine	
<0.002	>9	Clay	Clay

Size scales in GRADISTAT have been adapted from Udden and Wentworth classifications (Blott and Pye, 2001).

The results, given in **Appendix C**, present particle size distributions in terms of mean phi, fraction percentages (*i.e.* gravel, sand and fines), sorting (mixture of sediment sizes) and skewness (weighting of sediment fractions above and below the mean sediment size) (Folk and Ward, 1957). These indices are described below.

1) Graphic Mean – a measure of average particle size in phi units ($-\log_2(\text{dia}_{mm})$, Folk and Ward, 1957).

$$M_z = \frac{ø16 + ø84 + ø50}{3}$$

where M_z = The graphic mean particle size in phi
ø = the phi size of the n^{th} percentile of the sample

2) Sorting – the inclusive graphic standard deviation of the sample is a measure of the degree of sorting. Sorting classifications are presented in **Table 2.2**.

$$\sigma_I = \frac{ø84 - ø16}{4} + \frac{ø95 - ø5}{6.6}$$

where σ_I = the inclusive graphic standard deviation

3) Inclusive Graphic Skewness – the degree of asymmetry of a frequency or cumulative curve. Skewness classifications are presented in **Table 2.3**.

$$S = \frac{ø16 + ø84 - 2(ø50)}{2(ø84 - ø16)} + \frac{ø5 + ø95 - 2(ø50)}{2(ø95 - ø5)}$$

where: S = the skewness of the sample

4) Graphic Kurtosis – The degree of peakedness or departure from a 'normal' frequency or cumulative curve. Kurtosis classifications are presented in **Table 2.4**.

$$K = \frac{ø95 - ø5}{2.44(ø75 - ø25)}$$

where: K = Kurtosis

Table 2.2 Sorting Classifications

Sorting Coefficient (Graphical Standard Deviation)	Sorting Classifications
0 < 0.35	Very well sorted
0.35 < 0.50	Well sorted
0.50 < 0.71	Moderately well sorted
0.71 < 1.00	Moderately sorted
1.00 < 2.00	Poorly sorted
2.00 < 4.00	Very poorly sorted
4.00	Extremely poorly sorted

Table 2.3 Skewness Classifications

Skewness Coefficient	Mathematical Skewness	Graphical Skewness
1.00 > 0.30	Strongly Positive	Strongly fine skewed
0.30 > 0.10	Positive	Fine skewed
0.10 > -0.10	Near Symmetrical	Symmetrical
-0.10 > -0.30	Negative	Coarse skewed
-0.30 > -1.00	Strongly Negative	Strongly coarse skewed

Table 2.4 Kurtosis Classifications

Kurtosis Coefficient	Kurtosis Classification	Graphical meaning
0.41 < 0.67	Very Platykurtic	Flat-peaked; the ends are better sorted than the centre
0.67 < 0.90	Platykurtic	
0.90 < 1.10	Mesokurtic	Normal; bell shaped curve
1.11 < 1.50	Leptokurtic	Curves are excessively peaked; the centre is better sorted than the ends.
1.50 < 3.00	Very Leptokurtic	
3.00 +	Extremely Leptokurtic	

2.5 Total Organic Carbon

Sediment samples were treated with sulphurous acid to remove inorganic carbonates. Sediment samples were weighed into tin containers and dropped into a vertical quartz tube, heated to 900°C, through which a constant flow of helium is maintained. At the time of sample introduction, the helium stream is temporarily enriched with pure oxygen. Flash combustion takes place, primed by the oxidation of the container. Quantitative combustion is then achieved by passing the gases over Chromium III oxide (Cr_2O_3). The mixture of combustion gases passes over a reduction reactor filled with copper at 650°C to eliminate the excess oxygen and reduce nitrogen oxides to nitrogen. The gas mixture is then

introduced to a chromatographic column packed with 'Porapak QS' at approximately 100°C. The individual components are separated and eluted in the order N_2 - CO_2 - H_2O. They are measured by means of a thermal conductivity detector. The instrument is calibrated by combustion of known standard compounds. The limit of detection for this technique is 0.4%.

2.6 Hydrocarbons

2.6.1 Hydrocarbons by Ultra-Violet Fluorescence (UVF) Spectrometry

Ultra-violet fluorescence (UVF) spectrometry is now widely used in the marine field because of its high sensitivity and ease of use and minimal clean up requirements.

The sediment was initially digested with methanol. The hydrocarbons present in the filtered digest were extracted into pentane. The pentane extract was dried over anhydrous sodium sulphate. The sample was then analysed by UVF spectroscopy at an emission wavelength of 360nm and excitation wavelength of 310nm and by comparison against standards prepared from 'Ekofisk' crude oil.

2.6.2 PAH by Gas Chromatography-Mass Spectrometry (GC-MS)

Labelled internal standards which are representative of the compounds determined were added to the soil sample. The sample was dried using Sodium Sulphate and then extracted by means of an Accelerated Solvent Extraction (ASE) system employing Acetone/Dichloromethane as the extraction solvent.

The resulting extract was evaporated to low volume (approx. 2-3ml) with a stream of nitrogen gas in an evaporator system. The solvent extract was then transferred to a GPC clean up system followed by Silica adsorbent clean up. An aliquot of the extract was injected onto a Gas Chromatograph (GC) where the compounds of interest were separated on a capillary column. The eluate from the column was then analysed by a Mass Spectrometer (MS) operating in Electron Ionisation Mode (EI) where the compounds are detected.

2.6.3 Quality Control Samples

The following internal quality control samples were prepared alongside the sediments.

- An aqueous sample used as a blank;
- A matrix specific Certified Reference Material (CRM).

Results are presented in **Appendix D**.

2.7 Polychlorinated Biphenyls (PCBs) by GC-MS

2.7.1 Procedure

Surrogate standards were added to freeze dried samples, which was extracted with an Accelerated Solvent Extraction (ASE) system, with 1:1 Dichloromethane: Acetone as

solvent. The solvent extract was reduced in volume and interfering organic compounds of high molecular weight were removed using Gel Permeation Chromatography (GPC). The resulting post-GPC extract was concentrated prior to further clean-up by way of basic alumina, followed by a final acid clean-up step, using concentrated sulphuric acid. The eluate was reduced in volume before injection onto a GC-MS operating in selective ion mode (SIM).

2.7.2 Quality Control Samples

The following internal quality control samples were prepared alongside the sediments.

- An aqueous sample used as a blank;
- A matrix specific CRM.

Results are presented in **Appendix D**.

2.8 Organotins by GC-MS

2.8.1 Procedure

Samples were extracted using methanolic acetic acid, and were then derivatised and analysed by GC-MS.

2.8.2 Quality Control Samples

The following external profiency testing programs were used.

- Contaminated land scheme (CONTEST);
- Sediment sample exchange and organic parameters (SETOC).

Results are presented in **Appendix D**.

2.9 Metals

2.9.1 Quality Control

Internal QC was performed for trace metals analysis, using aqueous blanks, and matrix specific CRMs. External QC also took place within the Quasimeme and Aquacheck schemes.

2.9.2 Sediment Preparation

An open tube hot plate digestion was performed. The freeze dried samples were sieved to the required size fraction and then digested using a mixture of nitric, perchloric and hydrofluoric acids. This acid mixture allows a complete dissolution of metals from most soil and sediment types. The resulting digests were then analysed by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and/or Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) for the determination of metal contents.

2.9.3 Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)

Aluminium (Al), barium (Ba) and iron (Fe) were determined using ICP-OES using an Optima 3300 RL spectrophotometer. Concentration ranges and detection limits of the various elements analysed are presented in **Table 2.5**.

2.9.4 Inductively Coupled Plasma Mass Spectrometry (ICP-MS)

Arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lithium (Li), manganese (Mn), nickel (Ni), lead (Pb), vanadium (V) and zinc (Zn) were determined by ICP-MS using an Elan 9000 spectrometer. Concentration ranges and detection limits of the elements analysed are presented in **Table 2.5**.

2.9.5 Mercury (Hg) Extraction and Analysis

The dried sample was digested with nitric and hydrochloric acid in a microwave digester. The digest was filtered and completed with de-ionised water. The sample reacted with acidic stannous chloride in order to convert the Hg (II) into Hg (0) vapour. The Hg vapour was removed from the solution by a stream of argon and the Hg was detected by atomic fluorescence. The Hg vapour was swept from the solution into a PSA Merlin Fluorescence system. Concentration range and detection limits of Hg analysis are presented in **Table 2.5**.

Results are presented in **Appendix D**.

Table 2.5 Detection Limits and Concentration Ranges for Metals Analyses

Element	Concentration Range	Limit of Detection - LoD (mg/kg)	Method Of Detection	Analysing Instrument
Al	0-2.5mg l^{-1}	0.4	ICP-OES	Optima 3300RL
As	0-200µg l^{-1}	0.1	ICP-MS	Elan 9000
Ba	10-1000µg l^{-1}	10µg l^{-1}	ICP-OES	Optima 3300RL
Cd	0-20µg l^{-1}	0.05	ICP-MS	Elan 9000
Cr	0-200µg l^{-1}l	0.01	ICP-MS	Elan 9000
Cu	0-200µg l^{-1}	0.1	ICP-MS	Elan 9000
Fe	0-2.5mg l^{-1}	0.3	ICP-OES	Optima 3300RL
Hg	0-20µg l^{-1}	0.002	Atomic Fluoresence	PSA Merlin Fluorescence System
Li	0-200µg l^{-1}	0.1	ICP-MS	Elan 9000
Mn	0-200µg l^{-1}	0.2	ICP-MS	Elan 9000
Ni	0-200µg l^{-1}	0.3	ICP-MS	Elan 9000
Pb	0-200µg l^{-1}	0.2	ICP-MS	Elan 9000
V	0-200µg l^{-1}	1	ICP-MS	Elan 9000
Zn	0-200µg l^{-1}	0.2	ICP-MS	Elan 9000

2.10 Metalloids and Non Metals

2.10.1 Boron (B) Analysis

Water soluble boron samples were analysed using samples air dried overnight at 30ºC. A 10g dried sample was digested in water for 65 minutes using a digestion block set at 120ºC. After digestion the sample was allowed to cool for 30 minutes. The extract was

then filtered and made up to a 50ml final volume. Standards, blanks, QCs and reference materials were also run through the same process as the samples. The resulting sample was analysed using ICP-OES, a method widely used for analysing metals in aqueous or organic solutions.

The extract to be analysed is dispersed into a stream of argon gas via a nebuliser and spray chamber into a core of high temperature plasma sustained by radio frequency fields. Energy is transferred from the plasma to the extract which is desolvated, dissociated, atomised and often ionised during its passage through the plasma. In ICP-OES the light at a specific wavelength emitted by the excited boron atoms and ions in the plasma is measured to find boron concentration levels in the sample. In general the intensity of emission signal is directly proportional to the concentration of boron in the extract.

2.10.2 Selenium (Se) Analysis

Selenium in the sample was extracted using an aqua regia digest. A mixture of nitric and hydrochloric acid was used under gentle refluxing in order to extract Se. The extract was subjected to further heating with hydrochloric acid to reduce Se (VI) to Se (IV). The acidified extract reacted with sodium borohydride to produce hydrogen gas which combined with the selenium (IV) to produce selenium hydride (SeH_4). The hydride and excess hydrogen was transported by a stream of argon to a fluorescence detector, where a small chemically generated hydrogen flame acts as an atom cell. Atomic fluorescence is measured after excitation using a selenium boosted discharge hollow cathode lamp.

2.10.3 Quality Control

The following external proficiency testing programs were used.

- Contaminated land scheme (CONTEST)
- Sediment sample exchange and organic parameters (SETOC)

Results of analyses are presented in **Appendix D**.

2.11 Macrofaunal Analysis

2.11.1 Sorting and Identification

In the laboratory, samples were gently washed across a 1mm sieve to remove any sediment fines and preservative. The retained material was sorted by hand to extract all macrofauna. The organisms were identified and counted to produce a species list for each grab sample. Sample residues were checked by a second individual to provide a degree of quality control. Samples from each project were also sent to NMBAQC laboratories to check sieving, sorting, identification and biomass quality. These samples were chosen randomly, and NMBAQC re-analysed a random number of these samples. The similarity of the original sample and the QC sample was then compared, with a pass rate of 90%.

2.11.2 Data Set Rationalisation

The faunal data set was rationalised according to the standard GEL (2010) procedure, which is largely based on British Standard ISO16665:2005 (BSI, 2005) and OSPAR

(2004) guidelines. A summary of these methods follows.

Juveniles

The inclusion of juvenile organisms in data sets is a contentious issue, as is the definition of a juvenile. Only when the following conditions were satisfied was an organism recorded as a juvenile:

- Organisms that were too small or immature to be identified to species were identified to the lowest possible taxonomic level and recorded as juveniles.
- The organism was in a pre-adult life stage *e.g.* megalopa, praniza, *etc*.
- For large-bodied (>4cm) species of echinoderm and bivalve, the organism was less than 10% of the maximum body size reported in the literature.

In accordance with ISO16665:2005 guidelines, juveniles are recorded separately in the faunal list in **Appendix E**. Juveniles were included in the analysed data set at the lowest achievable taxonomic level. In the first instance, statistical analyses were performed after counts of juveniles of known species had been combined with adult records of that same species. In accordance with OSPAR (2004), if one or more of the juvenile taxa, or species that included juvenile records, were among the ten most dominant, then a 2STAGE analysis was carried out to compare the data sets with and without juveniles to determine if discussion of both sets is required. If the two data sets are found to be at least 95% similar, then the juveniles are included in the data set for all further multivariate analyses and discussion. Alternatively the multivariate analyses are additionally performed following exclusion of all juvenile records in order to illustrate their influence.

Damaged Specimens

Destructive sampling techniques and sieving may damage delicate benthic organisms. It is, therefore, commonplace for fragmented organisms to be found in faunal samples. The following conditions were applied to the recording of damaged specimens and fragments:

- Fragments that constituted a major component of an individual, that unequivocally represented the presence of an entire organism, and that could be identified to species level, were recorded and included with other counts of that species. Examples include: the heads of polychaetes and crustaceans; the complete mouth structure or central disk of brittle stars; the oral area/feeding tentacles of holothurians.
- Fragments that constituted a significant component of an individual, that unequivocally represented the presence of an entire organism, but that could not be identified to species by virtue of their incompleteness, were recorded to the lowest possible taxonomic level.
- Fragments that did not unequivocally represent the presence of an entire organism were ignored, e.g. *Amphiura* arms, *Echinocardium* shell fragments, etc.

Recorded fragments, therefore, represent discrete observations of individuals that were present at the time of sampling and were included in the analysed data set.

Treatment of Specific Groups of Organisms

GEL defines macrofauna as organisms that are *normally* larger than the mesh size of the sieve used to separate them from the sediment (GEL, 2010). Meiofaunal organisms, such

as the Ostracoda and Copepoda, which would not be consistently sampled, were not recorded. Due to their generally small size (in fully marine environments), species from the Oligochaeta, Tardigrada and Gnathostomulida were only enumerated when a sieve with a mesh size of 0.5mm or less was used to separate organisms from sediments; otherwise, these organisms were noted to be present, but not enumerated. Colonial, stoloniferous and encrusting epibenthic species were identified but not enumerated. With the exception of discrete sea pen (Pennatulacea) colonies, only solitary tunicates and cnidarians were enumerated and included in statistical analyses. Colonial tunicates and cnidarians were identified but not enumerated. The testate amoeba *Astrorhiza* sp. was the only foram routinely enumerated. When found, the presence of Porifera (sponges) was recorded, but not identified to lower taxonomic levels, enumerated, or included in statistical analyses.

In accordance with our in-house guidelines the following organisms, were not identified to species, but were enumerated and included in the data set for analyses at a higher taxonomic level:

- Nemertea – identified to phylum,
- Platyhelminthes – identified to class,
- Phoronida – identified to genus,
- Hemichordata – identified to class.

2.11.3 Biomass

Blotted wet weight biomass was obtained for major faunal groups by weighing after external fluid was removed on filter paper. Biomass was expressed as grams (g) of ash-free dry weight (AFDW) per grab sample, for each major taxonomic group. This was estimated using a conversion factor specific to each taxonomic group (Eleftheriou and Basford, 1989).

2.12 Statistical Analyses

2.12.1 Univariate Macrofauna Indices

Univariate community analyses were undertaken using the PRIMER Version 6 software package (Clarke and Warwick, 2006). Univariate indices seek, by means of a single number, to summarise information about some aspect of community structure. The two aspects of community structure contributing to the concept of diversity are species richness (a measure related to the total number of species present) and evenness (a measure relating to the pattern of distribution of individuals among the species present).

Diversity indices, as typified by the Shannon-Wiener index, are considered to be a relatively insensitive measure of anthropogenic disturbance. However, benthic ecologists have been able to demonstrate a clear inverse relationship between diversity and total oil concentrations in sediments (*e.g.* Davies *et al.*, 1984). They are therefore of some practical use for making comparisons between stations and sites.

The following indices were calculated and are presented in the report:

Shannon-Wiener Diversity Index

This is a widely used measure of diversity providing an integrated index of species richness and relative abundance (Clarke and Warwick, 2006). It is basically a measure of the difficulty of predicting the identity of an individual based on overall community composition. The Shannon-Wiener diversity index is expressed as:

$$H' = -\sum_{i=1}^{s} p_i \log_n p_i$$

where *H'* = Shannon-Wiener Diversity Index
P_i = proportion of the total number of individuals from the i^{th} species
n = log base value (log base 2 is used during this report; Shannon and Weaver, 1949)

H' integrates the number of species and individual abundance to provide a summary value reflecting the diversity of fauna at a station. This index of diversity is influenced by both species richness (*i.e.* the number of species) and evenness (or equitability) of distribution of individuals between species.

Simpson's Dominance Index

Simpson's is a dominance index derived from the probability of picking two individuals from a community at random that are from the same species. Therefore Simpson's dominance index values will be large when a community is dominated by one or a few species but lower when the community is diverse. Simpson's dominance index was calculated as follows:

$$\lambda = \sum p_i^{\,2}$$

where: λ = Simpson's Dominance Index
P_i = proportion of the total number of individuals from the i^{th} species

Simpson's dominance index ranges from 0 to 1 with values typically reflecting the abundances of the most common species in the samples.

Pielou's Evenness

Evenness (or equitability) is a representation of how uniformly individuals are spread between species in a sample. It is a component of, and calculated using, a theoretical diversity measure (in this instance Shannon-Wiener). High values (values range from 0 to 1) indicate low dominance. (NB. the log base that was used to calculate H' must also be used to calculate evenness).

$$J = \frac{H'}{Log_n S}$$

where *J* = Pielou's Evenness
H' = Shannon-Wiener Diversity index
S = total number of species in a sample

2.12.3 *Multivariate Analyses*

In addition to univariate analyses, the data were subjected to multivariate analysis using a number of different methods available within the PRIMER package (Clarke and Warwick, 2006). By considering the full data matrix as a whole and comparing each station with every other, multivariate analyses are able to highlight subtle trends in data sets that are commonly not identified when using univariate techniques. Multivariate techniques are not restricted to use with faunal data sets and if treated appropriately may also be used to compare complex chemical data sets. Multivariate analyses were computed from resemblance or similarity matrices. In the case of faunal abundance data these were constructed using the Bray-Curtis measure of similarity following transformation of the data to downweight the influence of highly abundant or dominant species. For the purposes of this survey, a square-root transformation was utilised. According to Clarke and Warwick (2006), square root transformation allows the intermediately abundant species to contribute to the similarity. PSA data resemblance matrices are computed using Euclidean Distance following transformation (where necessary) and normalisation to standardise measurement scales.

Cluster Analysis and SIMPROF

Cluster analysis groups samples according to their similarity *i.e.* samples within a group are more similar to each other than they are to samples in other groups. Clustering was by a hierarchical agglomerative method using group average sorting, and the results are presented as a dendrogram. Using PRIMER v6 it is possible to perform a SIMPROF (similarity profile) test at the same time as the cluster analysis to determine whether groups of samples are statistically indistinguishable or whether they contain identifiable structure. SIMPROF is an *a priori* test designed to identify groups of samples from unstructured data sets. The test employs a permutation-based analysis to determine whether groups of samples below each successive node of a dendrogram possess identifiable internal structure. If the result of a test at a particular node is not significant there is no identifiable structure within the samples below the node and they might therefore be considered to be a uniform group. A significant result indicates that samples within a group (below a particular node in the dendrogram) contain some structure and therefore may not be considered uniform. The analysis therefore identifies groups of samples that are each highly self-similar and also that are distinguishable from each other.

Ordination Analyses using non-Metric Multidimensional Scaling

Non-metric multidimensional scaling (nMDS or MDS) is a type of ordination method which creates a 2- or 3-dimensional ‘map’ of the samples (or stations) from the similarity matrix. The configuration of the samples on the ‘map’ is a reflection of their similarity, with distances between samples being representative of their dissimilarity.

It is normal for there to be some distortion (stress) between actual similarity values (in the resemblance matrix) and distance between samples on the ordination plot; perfect solutions are very rarely achieved when dealing with complex data sets. In order to achieve the lowest possible stress PRIMER adopts an iterative approach to ordination, constructing the plot by successively refining the positions of samples until the lowest stress is achieved. In reality the lowest possible stress is not always achieved since data

points may become trapped in local minima. It is therefore necessary to re-run the analyses multiple times to ensure that the lowest achievable stress is found. The ordination analysis results reported were the product of a minimum of 25 restarts. In instances where the lowest achieved stress was found for <5 (20%) of the restarts the ordination was repeated with 100 restarts to ensure that a lower stress result could not be found.

The scale and orientation of MDS ordinations are arbitrary so no axes are drawn on the plots. Stress values increase with sample size, and usually also with increasingly severe transformation of the initial data set (due to the increasing influence of rarer species on the outcome of analyses). The stress value may be used as an indication of the usefulness of plots, with a general guide being as follows (Clarke and Warwick, 2006):

<0.05	Almost perfect representation of rank similarities
0.05 to <0.1	Good representation
0.1 to <0.2	Still useful
0.2 to <0.3	Should be treated with caution
>0.3	Little better than random points

SIMPER

Where differences between groups of samples are found, SIMPER may be used to interpret which species, or environmental variables, are principally responsible for the differences between the groups and which are most responsible for the similarities within groups. The SIMPER analysis decomposes differences between all pairs of sample, one from each identified group, into their contributions from each species or variable, and ranks them in decreasing order of their contribution to overall dissimilarity.

RELATE

The RELATE test of PRIMER calculates the rank similarity of two specified data matrices, so, for instance, may be used to provide an indication of the effect of the removal of a subset of taxa (*e.g.* juveniles) on the structure of the data set overall.

2.13 Stony Reef Assessment

'Reefs' are one of the habitats listed under Annex I of the Habitats Directive for protection within Special Areas of Conservation (EC Habitats Directive 92/43/EEC) as implemented by the UK's Offshore Marine Conservation (Natural Habitats, &c.) (Amendment) Regulations 2010 and Conservation of Habitats and Species Regulations 2010. Although there is no definition of 'reefs' in the Habitats Directive itself, European interpretation of the habitat has been discussed and agreed upon as including bedrock, stony and biogenic reefs. 'Stony reefs' can comprise areas of boulders or cobbles which stand proud from the seafloor and can provide a suitable substratum for the attachment of benthic communities of algae and marine animals. Boulders and cobbles are generally considered to be greater than 64mm in diameter; and a feature of a 'stony reef' must be that it is topographically distinct from the surrounding sea floor.

A multi-criteria scoring system as outlined by Irving (2009) was used to assess the characteristics of a potential 'stony reef'. Each characteristic can be scored as Low, Medium or High; with spatial extent (m^2), patchiness (% cover) and elevation as the primary characteristics, outlined in **Table 2.6**.

Reef assessment was based solely on the seabed imagery (digital stills and video footage) in line with the established Gardline protocol and guidelines on the assessment of stony reef published by Irving (2009) and Limpenny *et al* (2010). Transects were selected based on areas of interest identified after analysis of geophysical data and initial camera investigations.

Assessment of the digital stills and video footage was carried out in accordance with the NMBAQC Scheme video guidance. The video was assessed for the substrate composition (i.e. % mud, sand, gravel, pebbles, cobbles and boulders), the elevation of substrate above the seabed and any other visible features relevant to the four characteristics listed in **Table 2.6.**

To analyse the minimum required $25m^2$ area and ensure assessment of the relevant area identified from the geophysical data, the entire footage was analysed for each station. The height of the camera system is estimated to have been about 1m above the seabed, giving it roughly a 1m (width) by 0.6m (height) field of view. (It should be noted that the scale bar visible is suspended just below the camera frame, so will be about 0.5m above the seabed). The digital stills and video footage covered areas from $270m^2$ to $479m^2$, adequate for the minimum requirement of $25m^2$ for stony reef assessment. The video footage was analysed by taking freeze-frame 'sub-samples' at approximately 60 second intervals over the entire transect footage, giving between 12 and 25 sub-samples per station. For each freeze-frame, the percent coverage of different substrates (boulders, cobbles, pebbles, gravel, sand and mud) was estimated, as well as an approximation of elevation (rugosity). This method was also employed for seabed stills. These measurements correspond to the scoring system (1-4) determined by Irving (2009) in **Table 2.6**.

Results of the stony reef assessment are presented in Section 3.2.1 for Tranche B and in Section 4.3.1 for TCC with summary sheets for each transect included in **Appendix F**. It is important to note that values for composition, extent, elevation and biota have not been assessed as an average value across the entire transect. Transects may contain areas which are not stony reef as well as areas which may be low or medium resemblance to stony reef. Areas of low and medium resemblance to stony reef have been discussed in relation to their patchiness, as averaging transect values would have masked potential areas of reef.

There was no evidence of the presence of any biogenic reef habitats within Tranche B or along the TCC survey routes, such as those formed by the ross worm *Sabellaria spinulosa* or the edible mussel *Mytilus edulis*.

Table 2.6 Stony Reef Assessment Criteria

Characteristic	NOT a 'stony reef'	Resemblance to being a 'stony reef'		
		Low	Medium	High
Composition	<10%	10-40% Matrix supported	40-95%	>95% Clast supported
Notes: • *Diameter of cobbles/boulders being greater than 64mm* • *Percentage cover related to a minimum area of 25m²* • *This 'composition' characteristic also includes patchiness* • *Matrix supported: Dominated by sediment (i.e. sand, mud, gravel) with cobbles surrounded by sediment* • *Clast supported: Dominated by cobbles/boulders, with cobbles/boulders touching one another*				
Elevation	Flat Seabed	<0.064m	0.064m-5m	>5m
Notes: • *Minimum height (64mm) relates to minimum size of constituent cobbles* • *This characteristic could also include 'distinctness' from surrounding seabed*				
Extent	<25m²	>25m²	>25m²	>25m²
Note: • *'Reefiness' increases as spatial extent increases*				
Biota	Dominated by infaunal species			>80% of species present composed of epifaunal species
Score	**1**	**2**	**3**	**4**

2.14 Biotope Classification

2.14.1 Background Information

The European Nature Information System (EUNIS) habitat classification is used to identify different habitats and biotopes, based on the biotic and abiotic features of the seabed. The system was developed between 1996 and 2001 by the European Environment Agency (EEA) in collaboration with experts from all over Europe. A marine habitat classification system for Britain, Ireland and the North-East Atlantic was developed by the Joint Nature Conservation Committee (JNCC) to form the marine habitat classification for Britain and Ireland (Connor *et al.,* 2004) and has been fully incorporated into EUNIS. **Table 2.7** shows the five EUNIS levels to describe the marine environment in Britain:

Table 2.7 EUNIS Marine Classification Levels

Level	Detail Covered (EUNIS/JNCC Classification)
1. Environment	e.g. Marine (A)
2. Broad Habitats	e.g. Sublittoral sediment (A5/SS)
3. Main Habitats	e.g Sublittoral sands and muddy sands (A5.1/SS.SSa)
4. Biotope Complexes	e.g. Circalittoral fine sanad (A5.25/SS.SSa.CFiSa)
5. Biotopes	e.g. *Abra prismatica, Bathyporeia elegans* and polychaetes in circalittoral fine sand (A5.252/SS.SSa.CFiSa.ApriBatPo)

Development of the EUNIS classification comes from both a top-down and a bottom-up approach. Top-down classification differentiates between rock and sediment habitats, and between those habitats on the shore (intertidal) and those in the subtidal or offshore

(deep) areas. These high-level divisions can be further subdivided on the basis of different types of sediment (e.g. gravel, mud), different degrees of wave exposure on rocky coasts (exposed, sheltered) and varying depth bands below the low water mark (e.g. shallow water where light penetrates, deeper water with little light). Such broad-scale differences in habitat character are readily understood by non-specialists and provide classification types that are easily mapped. However, they also have ecological relevance as they reflect major changes in habitat character upon which species distribution depends (Connor *et al.,* 2004).

Bottom-up classification differentiates between places with different species communities. Relative species composition, diversity and abundance vary from place to place and are dependant both on environmental characteristics and upon interactions between species. Surveyed sites with similar environmental characteristics, such as sediment type and depth, show certain levels of similarity within their species communities. Multivariate analysis of the data from field surveys (e.g. grabs and trawls) groups these into clusters that have similar character. These clusters form the basis of defining the types at the lower end of the EUNIS classification.

The top-down and bottom-up approaches have been merged together into the single hierarchical EUNIS classification, which enables broad-scale application in management and mapping, and fine-scale application for detailed survey, monitoring and scientific study.

The identification of the main habitat (EUNIS Level 3) is mainly based on depth and sediment type. The EUNIS classification hierarchy to biotope complex (Level 4) and biotopes (Level 5) includes the use of faunal data. The description of the six levels within the EUNIS classification hierarchy taken from Connor *et al.* 2004 are as follows:

Level 1 Environment (marine) - A single category is defined within EUNIS to distinguish the marine environment from terrestrial and freshwater habitats.

Level 2 Broad habitats - These are extremely broad divisions of national and international application for which EC Habitats Directive Annex I habitats (e.g. reefs, mudflats and sandflats not covered by seawater at low tide) are the approximate equivalent.

Level 3 Main habitats - These serve to provide very broad divisions of national and international application which reflect major differences in biological character. They are equivalent to the intertidal Sites of Special Scientific Interest (SSSI) selection units (for designation of shores in the UK) and can be used as national mapping units.

Level 4 Biotope complexes - These are groups of biotopes with similar overall physical and biological character. Where biotopes consistently occur together and are relatively restricted in their extent, such as rocky shores and very near-shore subtidal rocky habitats, they provide better units for mapping than the component biotopes, better units for management and for assessing sensitivity than the individual biotopes. They are relatively easy to identify, either by non-specialists or by coarser methods of

survey (such as video or rapid shore surveys), thereby offering opportunities for data collection by a wide range of people and without recourse to specialist species identification skills.

Level 5 Biotopes - These are typically distinguished by their different dominant species or suites of conspicuous species. On rocky substrata, most should be readily recognised by workers with a basic knowledge of marine species, although quantitative sampling will be necessary in many of the sediment types. The vast majority of available biological sample data are attributable to this level (or the sub-biotope level), which is equivalent to the communities defined in terrestrial classifications such as the UK National Vegetation Classification. Intertidal and subtidal sediment biotopes may cover very extensive areas of shore or seabed.

Level 6 Sub-biotopes - These are typically defined on the basis of less obvious differences in species composition (e.g. less conspicuous species), minor geographical and temporal variations, more subtle variations in the habitat or disturbed and polluted variations of a natural biotope. They will often require greater expertise or survey effort to identify.

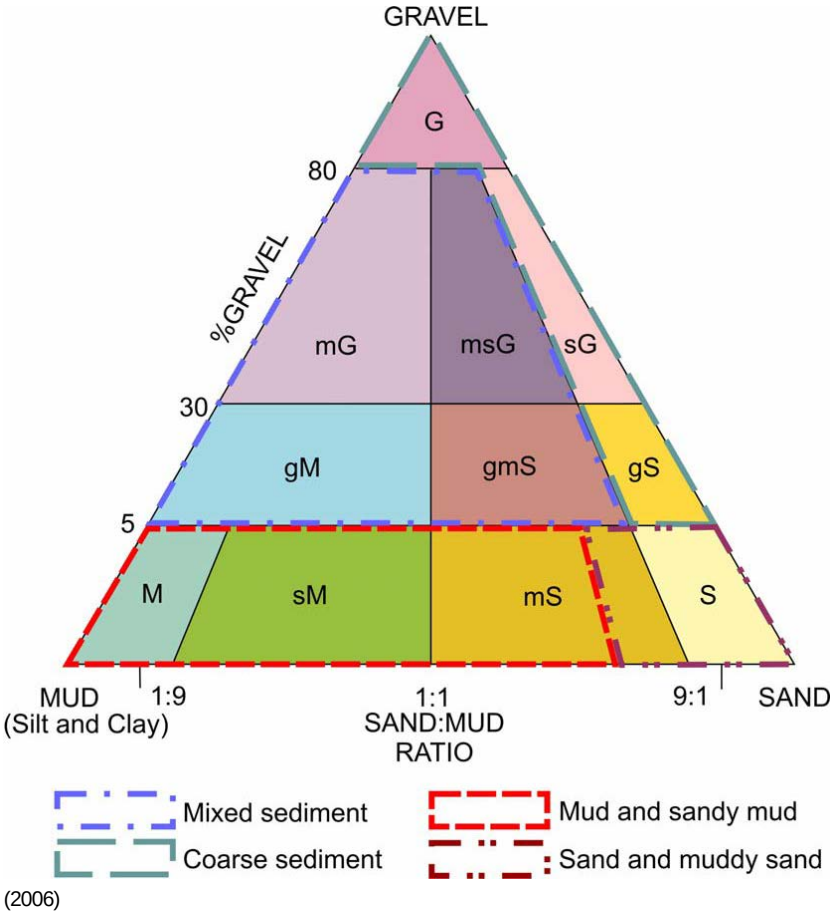
2.14.2 Biotope Classification Assessment Method

For the purpose of this assessment the habitat at each station has been classified to EUNIS Level 4 or where possible, Level 5. As the EUNIS system is mostly based on data collected from nearshore surveys, classifications to Level 5 may be unrealistic for a predominantly offshore survey such as this; the dominant fauna at the stations may not be closely matched with any of the current biotopes identified at EUNIS Level 5.

Classification to EUNIS Levels 5 and 6 is reliant on the quantification of infaunal species, obtained by grab sampling. Without this information, it is difficult to confidently assign a higher EUNIS classification at stations using seabed imagery data alone. As outlined in Section 1.2, 46 TCC stations were pre-selected by the Client for camera investigation only, while grab samples were not obtained at four of the selected Tranche B stations due to the potential for stony reef and at three stations along the TCC routes due to the coarse nature of the seabed. EUNIS classifications at these stations have therefore been assigned using seabed imagery only. Additionally, heterogeneity at the seabed and the geographical disparity between the acquired seabed footage and a single grab sample meant that at several stations it was difficult to achieve Level 5 EUNIS classification.

Along with review of the PSA results and macrofaunal composition, seabed video and stills were assessed for seabed composition and visible fauna. A British Geological Survey (BGS) modified Folk triangle was used to classify PSA results to reflect the broad substrate types used in seabed habitat classifications: rock, coarse sediment, mixed sediment, sand and muddy sand and mud and sandy mud (Long, 2006). At several stations, heterogeneity at the seabed has resulted in the identification of ‘mosaics’ of biotope complexes, e.g. where patches of coarse sediment were found among predominantly fine sand. The detailed biotope classifications for each station are presented in **Appendix G**.

Figure 2.1 BGS Modified Folk Triangle



From Long (2006)

3 RESULTS AND DISCUSSION - TRANCHE B

3.1 Geophysical Survey Summary

3.1.1 Bathymetry

Bathymetry of the Tranche B survey area is shown in **Figure 3.1** as colour bands with contours at 1m intervals. Water depths within the survey area varied from 21.5m LAT in the east to 38.5m LAT in the north. Generally, across the central, southern and western sectors of Tranche B, depths were between 25m and 35m LAT.

Areas of depths less than 25m occurred predominantly in the east of Tranche B, corresponding with a large plateau which extends to the south of the Tranche B area. Other minor areas with depths less than 25m occurred in the south and west, corresponding with topographic highs between seabed gullies. Areas with depths greater than 35m LAT occurred in the central northern area and in the west of the Tranche B area, comprising a series of elongated gullies, orientated northwest-southeast, up to 6m deep, where gradients reached up to 6° along their edges. Gradients across the rest of the seabed were generally less than 3°.

3.1.2 Seabed Features

SSS and magnetometer data were reviewed in conjunction with the bathymetry data in order to infer the sediment type and any potential hazards at the seabed such as wrecks, boulders, debris and infrastructures. Seabed features of the Tranche B survey area are presented in **Figure 3.2**. SSS data is displayed in **Figure 3.3**.

Two distinct sediment zones were identified. The first comprised featureless seabed of predominantly sand with scarce patches of coarse sand and gravel with megaripples and the second predominantly sand with frequent exposures of boulder clay/till within erosional features such as gullies and depressions, and accumulations of coarse sand and gravel within depressions. Megaripples were often observed within gravelly sand areas with wavelengths varying from 1.4m to 2.2m. The orientation of these megaripples was predominantly ENE-WSW to E-W associated with the predominant current and wave direction. Boulders were identified as sonar contacts with heights ≥0.3m, ranging in distribution from scattered discrete boulders within a generally featureless seabed to areas where boulders were more concentrated to areas of frequent boulders. These areas of frequent boulders are associated with gullies and till occurrences and also frequent cobbles. Areas of dense coarse sediment were identified on board as potential Annex I stony reef habitats (see Section 3.2.1).

There was evidence of trawling activity, with trawl scars identified throughout the survey area, generally being less frequent in the west and becoming more frequent in the east. Sonar, bathymetry and magnetometer anomalies were correlated in order to identify eight possible wrecks and six items of debris within the survey area. No pipelines or cables were expected or observed within the survey area.

3.2 Seabed Imagery

Seabed photography and video footage supported the initial interpretation of the geophysical data, revealing a relatively uniform seabed across much of Tranche B, with large areas of low reflectivity displaying sand with shell fragments. Stations investigated in high reflectivity areas revealed coarse sediments comprising gravel, pebbles and cobbles. These stations (TB_ 30 to TB_ 32, TB_ 47 to TB_ 50 and TB_ 53 to TB_ 55) were located in areas delineated as boulder clay/till, depressions and accumulations of coarse material or gravelly sand (**Figure 3.2**). A selection of seabed images is given in **Appendix B**.

Faunal density and diversity were relatively low within the dominant sandy sediments and noticeably increased within areas of high reflectivity and corresponding coarse sediments. Visible fauna within the sandy sediments predominantly comprised mobile species, including echinoderms (*Ophiura* sp., *Astropecten irregularis*, *Asterias rubens*), crustaceans (Brachyura, Paguridae, *Cancer pagurus*) and fish (Pleuronectiformes, *Buglossidium luteum, Eutrigula gurnardus*) in addition to occasional molluscs and hydrozoans. In areas of coarse sediment including pebbles and cobbles, higher densities of encrusting fauna were visible, including the tube-building polychaete *Spirobranchus* sp. (*Pomatoceros* sp. synonym), soft coral (*Alcyonium* sp.), hydrozoans and bryozoans, including *Bugula* sp. Increased densities of brittlestars Ophiotrichidae were also observed in these areas, along with sea urchins *Echinus esculentus* and *Psammechius* sp.

3.2.1 Stony Reef Habitat Assessment

Initial interpretation of the geophysical data and seabed imagery identified several areas as having possible resemblance to stony reef habitat. Nine transects assessed using both digital stills and video footage were analysed for interpretation. Reef assessment was based solely on the seabed imagery (digital stills and video footage) in line with the established Gardline protocol and guidelines on the assessment of stony reef published by Irving (2009) and Limpenny *et al.* (2010), detailed in Section 2.13. Transects were selected in areas of interest identified in the geophysical data, the details for which are included in **Table 3.1**. Results of the stony reef assessment are presented in **Table 3.2**, summary sheets for each transect included in **Appendix F**.

Figure 3.1 Bathymetry - Tranche B

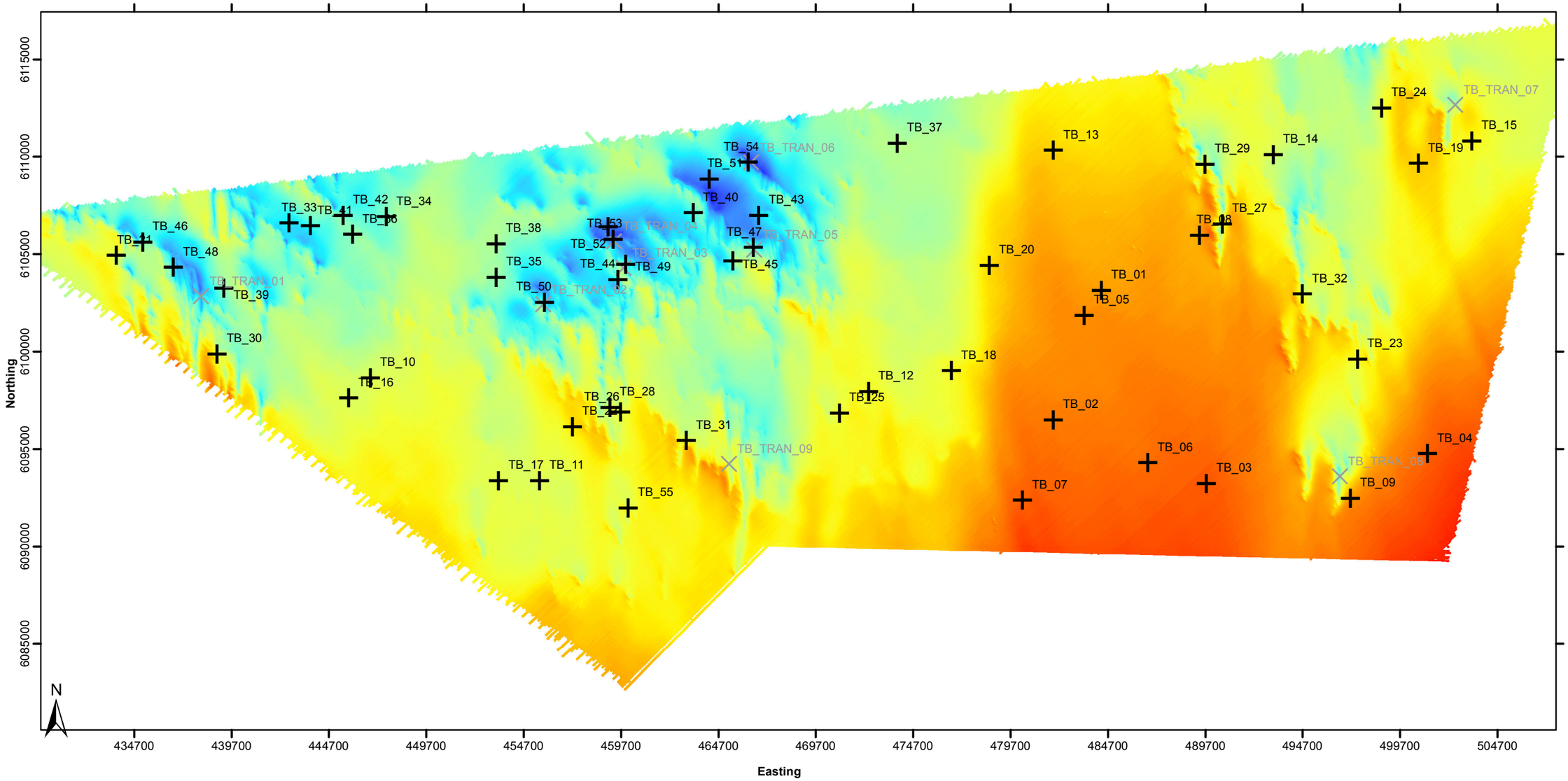
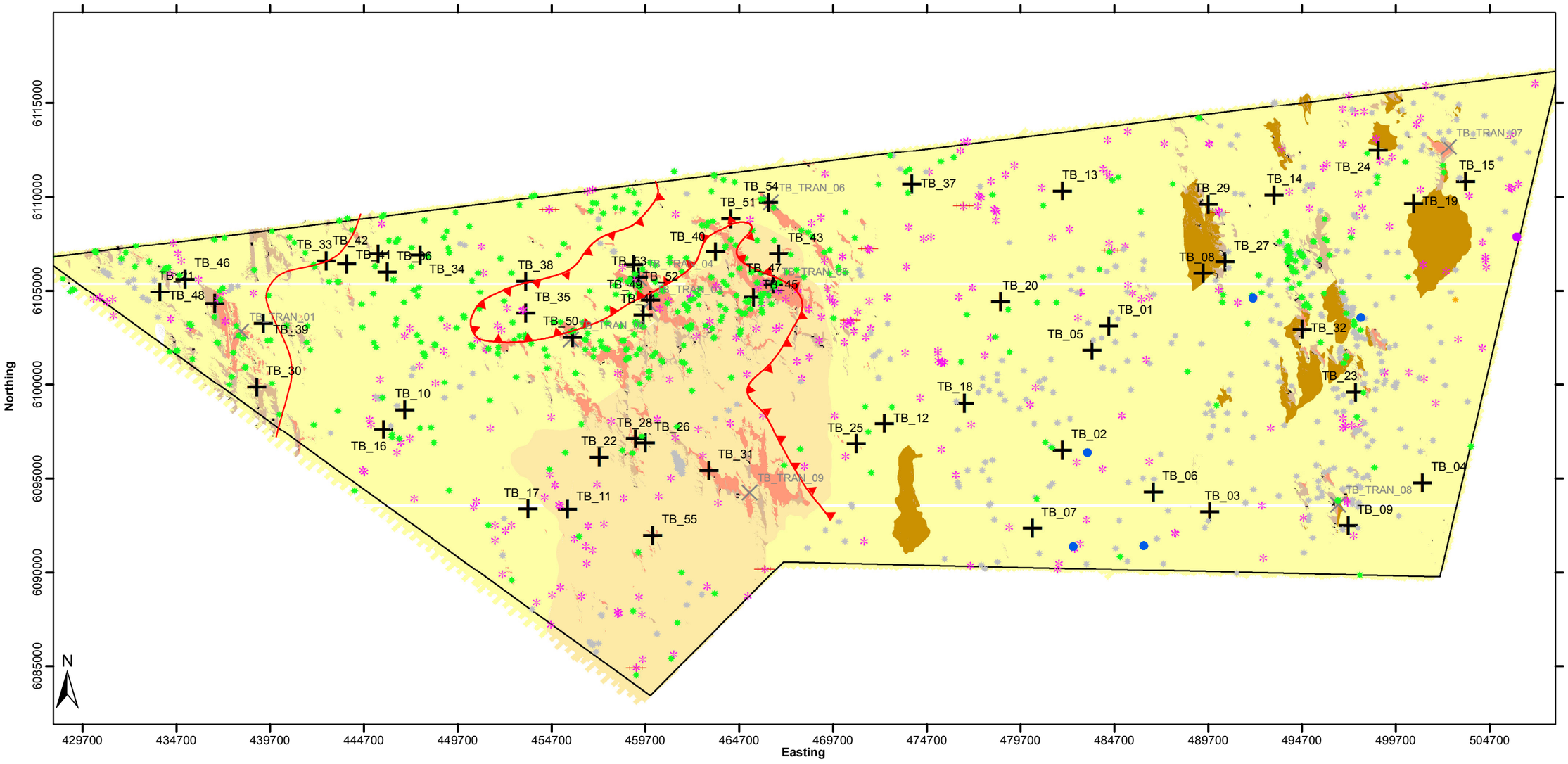


Figure 3.2 Seabed Features - Tranche B



Key

- Environmental Target Location
- Transect Target Location
- Geophysical Survey Area
- Debris
- Debris in depressions
- Limit of Infrequent Trawl Scarring Area [1]
- Limit of Intense Trawl Scarring Area [1]
- Boulders
- Boulders in depressions
- Depression point
- Magnetometer anomaly
- Wreck
- Boulder Clay (Till) with boulders, cobbles and patches of sand
- Depressions and accumulations of coarse material
- Coarse sand
- Fine to medium sand
- Gravelly sand
- Silty sand

1 Trawl scars were absent in the west, infrequent in the central area and intense in the east

Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E

0 5 10 15 20 Kilometres

Figure 3.3 Sidescan Sonar Mosaic - Tranche B

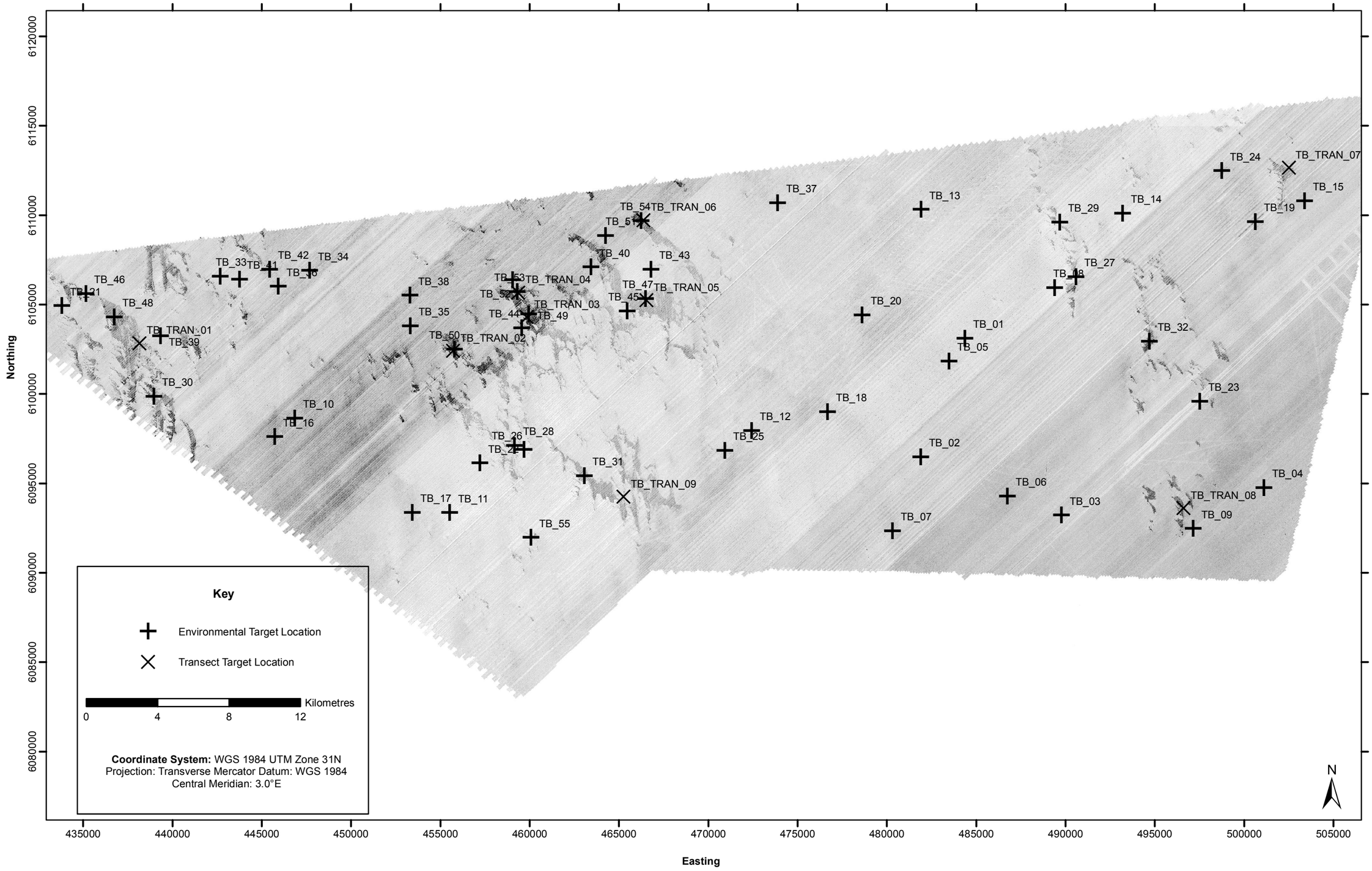


Table 3.1 Transect Target Information

Transect	Reason for transect selection	SOL		EOL	
		Target Easting	Target Northing	Target Easting	Target Northing
TB_TRAN_01	High reflectivity in the west of the survey area	438056	6102757	438230	6102936
TB_TRAN_02	Further investigation near TB_50 (possible stony reef in area of high reflectivity)	455617	6102522	455794	6102352
TB_TRAN_03	Further investigation near TB_49 (possible stony reef in area of high reflectivity)	459956	6104480	459760	6104176
TB_TRAN_04	Further investigation near TB_53 (possible stony reef in area of high reflectivity)	459258	6105755	459481	6105557
TB_TRAN_05	Further investigation near TB_47 (possible stony reef in area of high reflectivity)	466467	6105359	466604	6105076
TB_TRAN_06	Further investigation near TB_54 (possible stony reef in area of high reflectivity)	466216	6109735	466466	6109718
TB_TRAN_07	Varied/mottled reflectivity in northeast of survey area	502575	6112481	502508	6112732
TB_TRAN_08	Ribbon of reflectivity, dense ripples and mottled reflectivity in southeast corner of survey area	496401	6093498	496699	6093689
TB_TRAN_09	Variable areas of high reflectivity	465356	6094365	465151	6094227

SOL: Start of line, EOL: End of line

Table 3.2 Stony Reef Assessment Results

Transect	Composition (% Cobbles/ Boulders)	Elevation (m^2)	Extent (m^2)	Biota	Resemblance to 'Stony Reef'
TB_TRAN_01	<10%	Flat seabed	<25m^2	Predominantly infauna	Not a 'stony reef'
TB_TRAN_02	10-40%	<0.064m	<25m^2	Mixed infauna and epifauna	Not a 'stony reef'
TB_TRAN_03	10-40%	<0.064m	>25m^2	Mixed infauna and epifauna	Low resemblance
TB_TRAN_04	10-40%	<0.064m	>25m^2	Mixed infauna and epifauna	Low resemblance
TB_TRAN_05	10-40%	<0.064m	>25m^2	Mixed infauna and epifauna	Low resemblance
TB_TRAN_06	10-40%	<0.064m	>25m^2	Mixed infauna and epifauna	Low resemblance
TB_TRAN_07	40-95%	0.064m-5m	>25m^2	Mixed infauna and epifauna	Medium resemblance
TB_TRAN_08	10-40%	<0.064m	>25m^2	Mixed infauna and epifauna	Low resemblance
TB_TRAN_09	40-95%	0.064m-5m	>25m^2	Mixed infauna and epifauna	Medium resemblance

It is important to note that in many cases, values for composition, extent, elevation and biota were not assessed as an average value across the entire transect. Transect areas ranged from 270m^2 to 479m^2 and footage and images were recorded across features of interest and surrounding featureless seabed. As such, all transects contain areas which are not stony reef as well as areas which may be medium or low resemblance to stony reef. Therefore, areas of low and medium resemblance to stony reef are discussed in relation to patches greater than 25m^2, as averaging transect values would have masked

potential areas of reef. The overall estimate of resemblance can therefore be considered the likely maximum resemblance for the area surveyed with the camera system.

At least 10% of cobble and boulder material, across an area greater than 25m^2 is required for an area to be classified as low resemblance to stony reef (Irving 2009; Table 2.6). Results from the analysis of the video footage and digital stills revealed a patchy distribution of pebbles, cobbles and boulders on sand. On average, transects contained areas between 1% and 29% cobble and boulder material. Patches of up to 65% cobble and boulder material (indicating medium resemblance to stony reef), were recorded at Transects TB_TRAN_05, 07 and 09. However, these patches did not cover a large enough area (>25m^2) at TB_TRAN_05 to constitute medium resemblance stony reef.

Five transects were identified as having passed over areas >25m^2 of low resemblance to stony reef (TB_TRAN_03, 04, 05, 06 and 08); these contained up to 35% cobble and boulder material and had an associated greater abundance of epifauna. Two transects (TB_TRAN_01 and TB_TRAN_02) showed no resemblance to stony reef. Two transects (TB_TRAN_01 and TB_TRAN_02) were classified as having no resemblance to stony reef. Although Transect TB_TRAN_02 contained small patches of 10 – 40% cobbles, none of these patches extended to above 25m^2.

Abundant epifauna were recorded across all transects, with particularly high densities of echinoderms (*Ophiothix fragilis*) and cnidarians (*Alcyonium* sp.) evident at transects TB_TRAN_04, 05 and 06.

Transects TB_TRAN_07 and TB_TRAN_09 contained areas >25m^2 which could be classified as medium resemblance to stony reef when all criteria were considered. Assessment of the video footage revealed patches of up to 60% boulders, 20% cobbles and association with abundant epifauna. Although slightly lower epifaunal abundances were observed along TB_TRAN_09, medium resemblance to stony reef was scored overall due to large areas of cobbles and boulders.

Transects identified as having areas of resemblance to stony reef habitat (including those classified as low resemblance) were in areas identified as predominantly boulder clay/till. A summary sheet for each transect is included in **Appendix F**.

There was no evidence of the presence of any biogenic reef habitats within the Tranche B survey area, such as those formed by the ross worm *Sabellaria spinulosa* or the edible mussel *Mytilus edulis*.

3.2.2 Other Features of Conservation Importance

The UK section of the Dogger Bank has been designated as a candidate Special Area of Conservation (cSAC) and has been submitted to the European Commission for approval as a Site of Community Importance (JNCC, 2011). The Dogger Bank is the largest single continuous expanse of shallow sandbank in UK waters and contains the Annex I habitat 'Sandbanks which are slightly covered by sea water all the time', as protected under the EC Habitats Directive 92/43/EEC (JNCC, 2011). The presence of this Annex I habitat is a

primary reason for the selection of the site as a cSAC and the habitat consists of sandy sediments that are permanently covered by shallow sea water, typically at depths of less than 20m below chart datum. Sandbanks can, however, extend beneath 20m depth and it can be appropriate to include such areas in designations where they are part of the feature and host its biological assemblages (CEC, 2007). Shallow sandy sediments are typically characterised by a burrowing annelids, crustaceans, bivalve molluscs and echinoderms. Mobile epifauna may include shrimps, molluscs, crabs and fish.

Although depths recorded within Tranche B were generally >20m, due to the proximity of this area to known areas of Annex I sandbank habitat in <20m of water (see Location Map, page viii), the presence of a shallower plateau to the east and south of the survey area and the similarity of fauna observed to those typically found in shallow sandbank habitats, Tranche B could be considered to be within an area of 'Sandbanks which are slightly covered by sea water all the time'. Annex I 'Sandbank' habitats correspond with the priority habitat Subtidal Sands and Gravels in the UK Biodiversity Action Plan (UKBAP, 2011).

Assessment of seabed footage and imagery alone did not reveal evidence of any features of conservation importance on the OSPAR (2008) list of threatened and/or declining species and habitats. OSPAR species found during macrofaunal analyses are discussed separately in Section 3.7.2.

3.3 Sediment Sampling Summary

A total of 58 mini-Hamon grab samples were retained from 78 attempts and 22 Day grab samples from 26 attempts. The majority of failed sampling attempts were due to low retention or due to coarse material getting caught in the jaws of the grab, allowing sediment washout. These failed attempts have been taken into consideration when interpreting the results, as the retained sample may be a finer representation of the sediment type at that station. Grab sampling was not carried out at four stations (TB_31, TB_47, TB_54 and TB_55) identified as areas of potential stony reef habitat. At seven stations (TB_5, TB_7, TB_13, TB_18, TB_40, TB_51 and TB_53) where grab samples were below the acceptance criteria volume of 5L, fauna and PSA samples were taken from separate grab samples.

All retained samples were taken from within 50m of the target location, with 69% taken from within 20m. On average, samples were taken 16.5m (±11.0SD) from their target location. Exact positions of the sampling attempts are presented in the surveyor's logs in **Appendix A** and a selection of photographs of the grab samples can be found in **Appendix B**.

3.4 Sediment Characteristics

3.4.1 Sampling Observations

Observations of the sediment were made by the field environmental scientists at the time of sampling and are presented in the environmentalist's deck logs in **Appendix A**. Deck observations were consistent with interpretation from the acoustic data and with evidence from seabed imagery, with sediments being described as fine to coarse sand with varying quantities of shell fragments. Coarser sediments were observed at Stations TB_48, TB_50 and TB_53, consisting of gravel, pebbles and cobbles.

Slightly anoxic odours were observed from sediment samples at Stations TB_11, TB_17, TB_22, TB_25, TB_26 and TB_32. **Table 3.3** summarises the sediment colour and code classified according to the Munsell colour chart for each of the Tranche B grab stations (with the exception of Station TB_33 where no Munsell colour was recorded). A selection of photographs of the grab samples can be found in **Appendix B**.

Table 3.3 Munsell Colour Summary

Munsell Code	Description	Number of stations (n=50)
2.5Y 3/1	Very dark grey	3
2.5Y 3/2	Very dark greyish brown	4
2.5Y 3/3	Dark olive brown	9
2.5Y 4/1	Dark grey	7
2.5Y 4/2	Dark greyish brown	19
2.5Y 4/3	Olive brown	4
2.5Y 5/2	Greyish brown	2
2.5Y 5/4	Light olive brown	2

3.4.2 Particle Size Analysis

The full results of the sediment particle size analyses, determined using a Malvern Mastersizer, in addition to wet and dry sieving, including histograms illustrating the particle size distributions at each station, are presented in **Appendix C**.

Sediments across Tranche B were found to be broadly uniform, with the majority (73% of stations) described as moderately sorted to well sorted fine sand under the Wentworth classification system. The Wentworth system is based on mean particle size and is thus less reliable for poorly sorted sediments, for which the Modified Folk classification system is more useful. Modified Folk classifications for the remaining 14 stations with poorly sorted or very poorly sorted sediments of gravelly sand, sandy gravel and gravel were generally consistent with coarser sediments delineated on the seabed features (**Figure 3.2**). **Table 3.4** summarises the Modified Folk results. Ninety-percent of all stations were dominated by sand, with low fines (<63µm) and gravel (>2mm) content. Highest fines were found at Stations TB_37 and TB_53 (3.7% and 7.2% respectively) with all other stations recording fines of ≤1.9%. Gravel dominated the sediments at Stations TB_30 (72.1%), TB_48 (93.3%), TB_50 (81.6%) and TB_53 (72.4%) and at Station TB_49 the proportion of gravel equalled that of sand (49.0% gravel and 49.3% sand). These stations were identified as areas of coarse sand or boulder clay with boulders, cobbles and patches of sand on the

seabed features chart. **Figure 3.4** illustrates the distribution of the principal sediment components across Tranche B survey area.

Multivariate statistical analyses were performed on the PSA data using PRIMER Version 6 (Clarke and Warwick, 2006) in order to display the relationship between stations based on sediment characteristics. Mean particle size (phi) was removed from the analyses due to its intrinsic relationship with mean particle size (µm) and all variables were log transformed due to skewed distributions. The data were then normalised and subjected to Euclidean distance similarity dendrogram and MDS interpretation.

The MDS plot (**Figure 3.5a**) provides an illustration of the similarity between samples based on sediment composition, overlain with the Modified Folk classifications for each station. The majority of stations were classified as slightly gravelly sand and were closely associated. Investigation of the raw data, in conjunction with a SIMPER analysis indicated that the distribution of groupings and outliers was generally based on differences in the composition of the proportion of gravel and fines. **Figures 3.5b** and **3.5c** show the MDS ordination overlain with percentage gravel and percentage fines, respectively. As expected, Stations TB_30, TB_48 to TB_50 and TB_53 were separated from all others based on a higher proportion of gravel and Station TB_53 was also separated as an outlier based on a slightly higher fines content. Stations TB_30 and TB_48 were sampled in the west of the survey area and Stations TB_49, TB_50 and TB_53 in the north central part of the survey area, identified from acoustic data in areas of generally deeper water depth described as erosional features such as gullies and depressions, and accumulations of coarse sand and gravel within depression.

3.4.3 Organic Carbon

Total organic carbon (TOC) results are presented in **Appendix C**. TOC content of the sediment was below the LoD of 0.4% at all 11 sampled stations across the survey area.

Table 3.4 Modified Folk Classification Summary

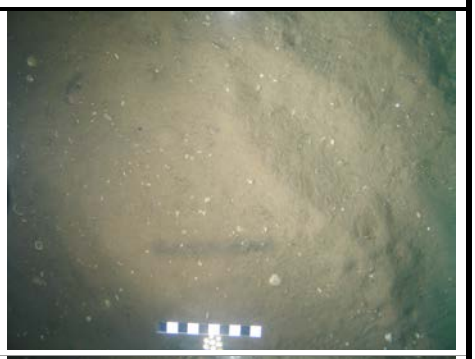
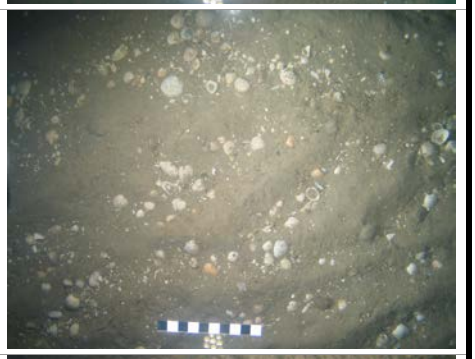
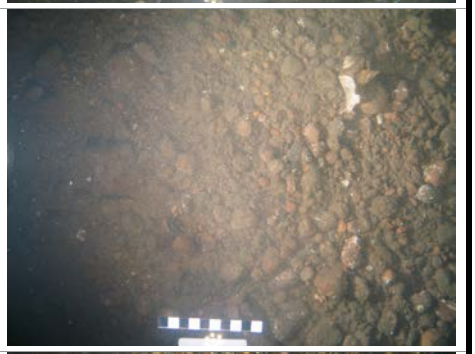
Modified Folk Classification	Number of stations (n=51)	Representative Seabed Image
Slightly gravelly sand **(g)S**	36	
Gravelly sand **gS**	10	
Sandy gravel **sG**	2	
Gravel **G**	2	
Muddy sandy gravel **msG**	1	

Figure 3.4 Distribution of Principal Sediment Components within Tranche B

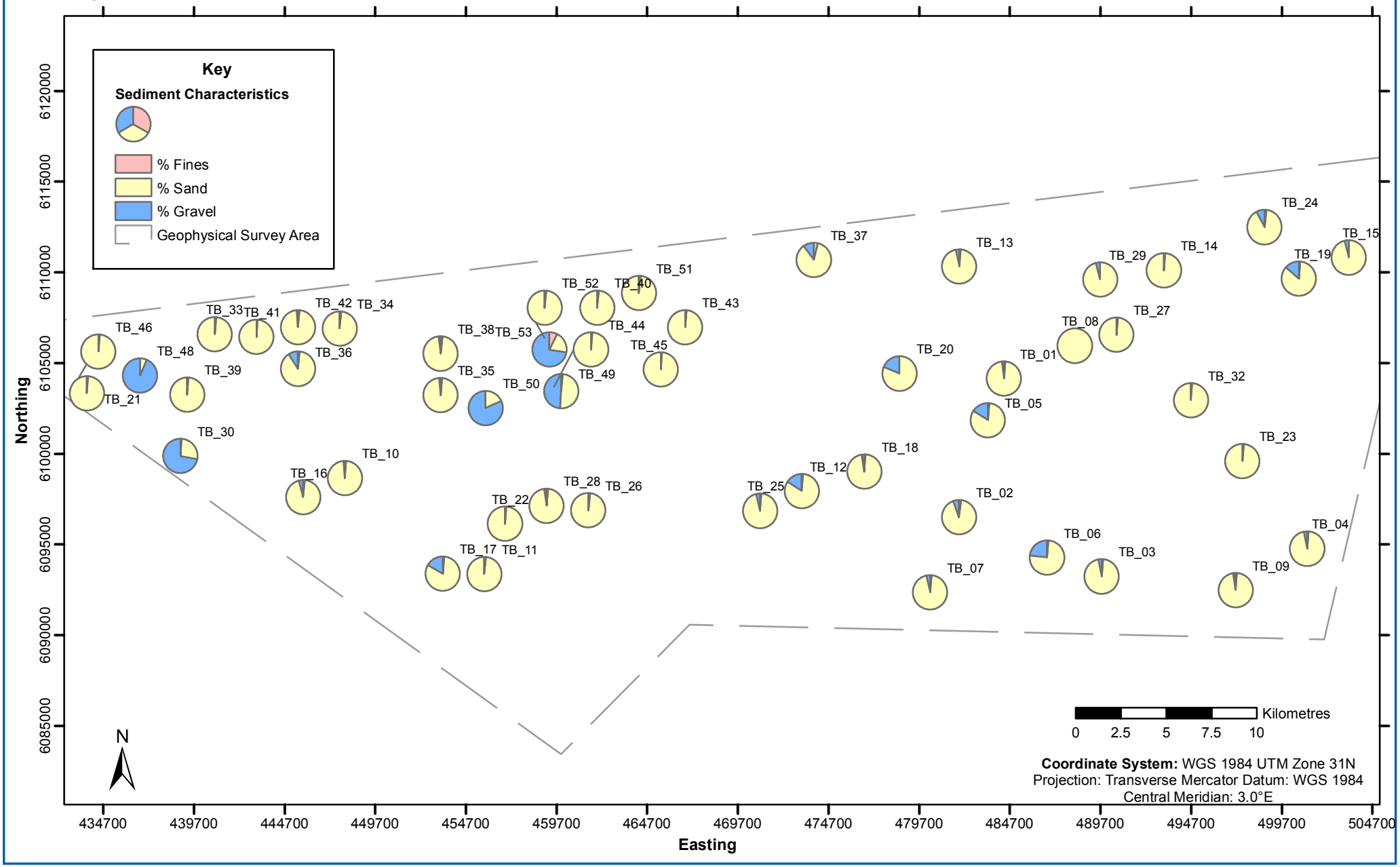
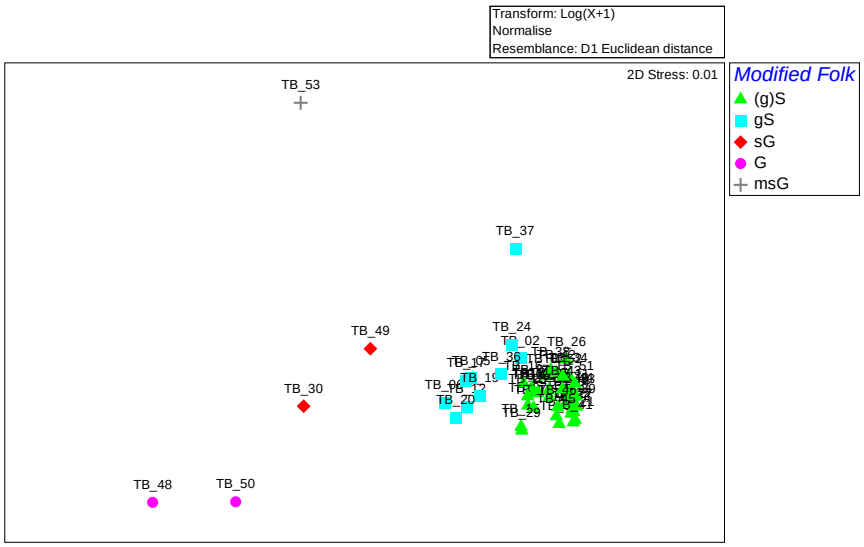
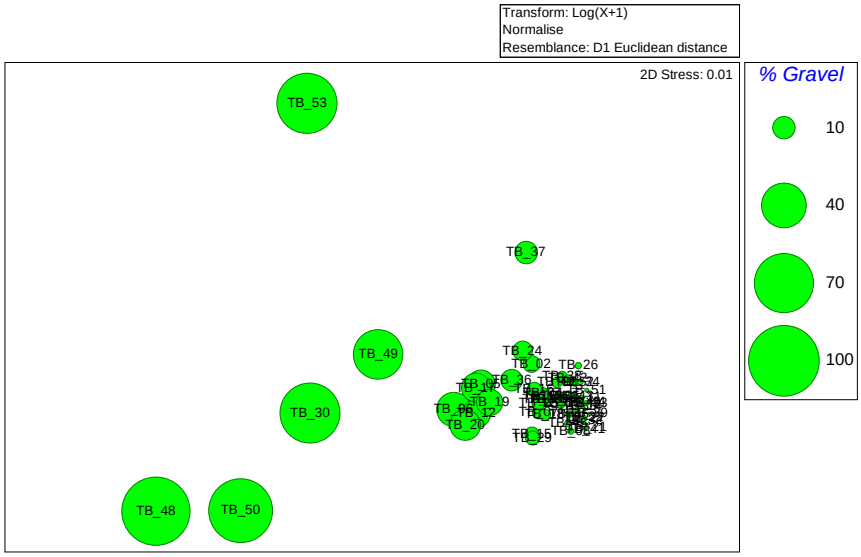


Figure 3.5 PSA MDS Ordination Bubble Plot

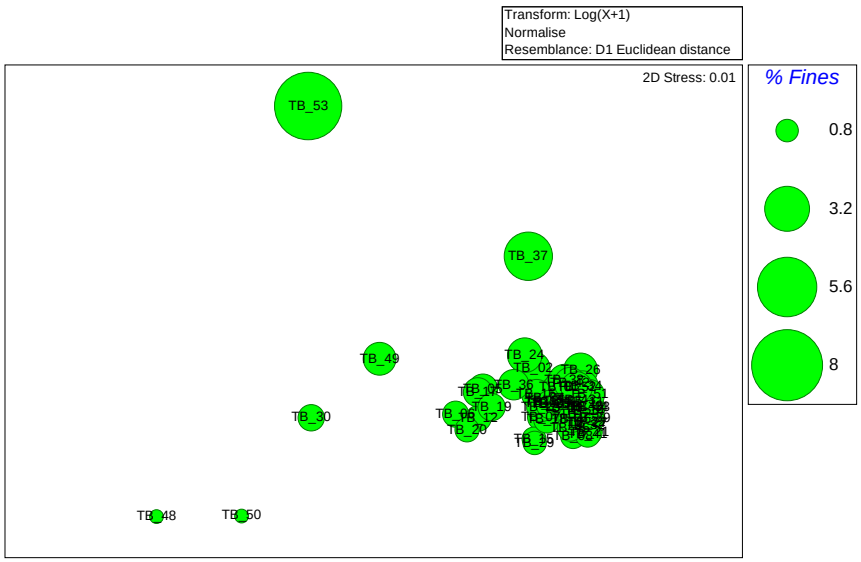
a) Modified Folk Classification



b) Gravel (>2mm)



c) Fines (<63µm)



3.5 Contaminants

3.5.1 Hydrocarbon Concentrations

Hydrocarbon concentrations at all 11 sampled stations are presented in **Appendix D**. Where available, hydrocarbon concentrations were compared to the Effects Range Low (ERL) and Effects Range Median (ERM) levels published by Long *et al*. (1995) as well as the Canadian Environmental Quality Guidelines for the Protection of Aquatic Life (Interim Sediment Quality Guidelines; ISQG) and Probable Effect Level (PEL; CCME, 1999).

ERL and ERM concentrations are not actual thresholds of toxicity, but delineate concentration ranges with associated probabilities of toxicity. Concentrations below the ERL represent a range in which detrimental effects on benthic taxa (mainly amphipods) would rarely be observed; concentrations equal to or above the ERL, but below the ERM, represent a range within which effects could be occasionally expected and concentrations equalling or exceeding the ERM represent a range within which effects could frequently be expected.

Similarly, Canadian ISQG and PEL concentrations can be used as an assessment tool for identifying sediments in which adverse biological effects are more likely to occur (CCME, 1999):

<ISQG	The minimal effect range within which adverse effects rarely occur.
ISQG>PEL	The possible effect range within which adverse effects occasionally occur.
>PEL	The probable effect range within which adverse effects frequently occur.

However, the ISQG and PEL should be used with caution and findings treated as indicative, as they have been designed specifically for Canada, are based on the protection of pristine environments and species used in deriving these guidelines may have different sensitivities to those in the North Sea.

Total hydrocarbon concentrations (THC) varied between 0.100mg kg^{-1} at Station TB_CHEM_40 situated in the centre north of the survey area and 0.930mg kg^{-1} at Station TB_CHEM_19 in the east. Total PAH concentrations were below 0.140mg kg^{-1} at all stations sampled. Out of the 11 investigated stations, only four (TB_CHEM_01, TB_CHEM_10, TB_CHEM_13 and TB_CHEM_17) presented PAH concentrations above the limit of detection (LoD). All stations investigated presented individual PAHs concentrations below the Canadian ISQGs and PELs (CCME, 1999), as well as their respective ERLs and ERMs (Long *et al*., 1995), with the exception of naphthalene, which was above its Canadian ISQG, but below the PEL at Stations TB_CHEM_01, TB_CHEM_10 and TB_CHEM_17.

3.5.2 Metal and Metalloid Concentrations

A summary of the results of the metals analyses is presented in **Table 3.5**. Metal concentrations at all 11 sampled stations are presented in **Appendix D**. Where available, metal concentrations were compared to the CEFAS (2003) Action Levels (AL) for dredged

material, the Effect Range Low (ERL) and Effects Range Medium (ERM); Long *et al.*, 1995), the Canadian Interim Sediment Quality Guidelines (ISQG) and Probable Effect Limit (PEL; CCME, 1999), and the Apparent Effects Threshold (AET; Buchman, 2008). CEFAS Action Levels are not statutory contaminant guidelines, but are used as part of a 'weight of evidence' approach to assessing dredged material and its suitability for disposal to sea (CEFAS, 2003). Contaminant levels in dredged material which fall below AL1 are of no concern and are unlikely to influence decision-making, while contaminant levels above AL2 are generally considered unsuitable for sea disposal. Contaminant levels between AL1 and AL2 require further assessment. AETs were obtained by establishing relationships between sediment metal concentrations and benthic community toxicological impacts, and correspond to the highest concentrations at which no toxicological effects were observed.

Table 3.5 Summary of Metals Concentrations and Quality Criteria

Metal (mg kg^{-1})	Minimum	Maximum	Number of stations above:						
			Action Level 1[1]	Action Level 2[1]	Interim Sediment Quality Guidelines (ISQG)[2]	Probable Effect Levels (PEL)[3]	Effect Range Low (ERL)[4]	Effect Range Median (ERM)[4]	Apparent Effect Threshold (AET)[5]
Aluminium	12100	19200							
Barium	137	192							
Iron	3680	18700							
Arsenic	2.22	5.31							
Cadmium	<0.03	0.071							
Chromium	10	112	1		1		1		1
Copper	2.64	160	1		1	1	1		
Lead	6.57	12.6							
Lithium	4.38	6.85							
Manganese	103	665							4
Mercury	<0.002	<0.002							
Nickel	2.37	52.4	1				1	1	
Tin	<0.5	1.24							
Vanadium	7.98	30.6							
Zinc	7.47	46.3							
Boron	2.03	2.61							
Selenium	<0.1	<0.1							

All concentrations expressed in mg kg^{-1}(or

Number of stations indicated in red recorded above respective Quality Criteria and all (or remaining) stations below highlighted in green

1 AL (Action Level; CEFAS, 2003)
2 ERL (Effects Range Low) and ERM (Effects Range Medium (ERM); Long *et al.*, 1995)
3 Interim Sediment Quality Guidelines (ISQG; CCME, 1999)
4 Probable Effects Limit (PEL; CCME (1999))
5 Apparent Effects Threshold (AET; Buchman, (2008))

As, Cd, Pb and Zn concentrations were all below their respective AL1s and AL2s, ISQGs and PELs, ERLs and ERMs as well as AETs at all sampled stations. Of the remaining metals, concentrations were also below their respective threshold values at all stations, with the exception of Station TB_CHEM_17. At this station, Cr presented a concentration above its AL1, ISQG, ERL and AET; Cu presented a concentration above its AL1, ISQG and PEL as well as ERL; Ni was above the AL1, ERL and ERM (CEFAS, 2003; CCME,

1999; Long et al., 1995; Buchman; 2008). The AET was the only background information available for concentrations of Mn, Sn, V and Se. Mn was above its AET (Long *et al*., 1995) at stations TB_CHEM_04, TB_CHEM_17, TB_CHEM_19 and TB_CHEM_36. Sn, V and Se presented concentrations below their respective AETs at all sampled stations across the survey area.

3.5.3 *Polychlorinated Biphenyls (PCBs)*

The results of the analyses for seven chlorinated biphenyl congeners are provided in **Appendix D**. PCB concentrations were below the limit of detection of 0.1µg kg^{-1} at all stations sampled across the survey area.

Background sediment concentrations for individual congeners are normally <0.002µg g^{-1} (<2µg kg^{-1}) in the North Sea (Baeyens *et al*., 2000), the results therefore suggest that PCB concentrations at the sampled stations were representative of the wider area.

Organotins

Organotin concentrations are presented in full in **Appendix D**. Tributyltin (TBT) has received the most attention since being shown to be an endocrine disruptor. The use of TBT in anti-fouling paints resulted in widespread contamination of the marine environment, particularly in harbour areas.

Baeyens *et al*., (2000) indicate that concentrations of TBT in the sediment of UK waters range from <0.002µg g^{-1} offshore to 10µg g^{-1} in harbours. The concentration of TBT in the sediments collected during this survey were below the limit of detection at all sampled stations (<4µg kg^{-1} = 0.004µg g^{-1}), and were considered to be representative of the wider area of the North Sea.

3.5.4 *Contaminants Summary*

Hydrocarbons within Tranche B were generally uniform and most were below their respective LoDs. All hydrocarbons were below published threshold levels, where available, with the exception of naphthalene, which recorded values above the Canadian ISQG at Stations TB_CHEM_01, TB_CHEM_10 and TB_CHEM_17. Where available, metal concentrations at all stations were below their respective threshold levels, with the exception of Station TB_CHEM_17, where Cr, Cu, Ni and Mn concentrations were above several of their respective threshold levels. Mn concentrations elevated above the AET were also recorded at Stations TB_CHEM_4, TB_CHEM_19 and TB_CHEM_36. PCB and organotin concentrations recorded were all below their LoDs and respective background levels. In general, contaminants within the Tranche B survey area can be considered to be at expected background levels for the area.

3.6 *Macrofaunal Interpretation*

3.6.1 *Overview*

The primary impacts on benthic fauna from wind farm development include physical disturbances and long-term permanent habitat loss from pile foundation construction and

cable laying. The general effects of this include short-term sediment disturbance, abrasion, displacement and damage to fauna due to the effects of anchoring, drilling, digging and trenching (Hiscock *et al*., 2002). Long-term effects on the seabed due to altered hydrodynamic activity are also likely to result in modified faunal assemblages, as well as the creation of new habitats. The purpose of the macrofaunal investigation in this survey is to characterise the benthic communities within Tranche B so that an EIA can be undertaken.

One faunal sample was collected using a 0.1m^2 Hamon grab at each station (with the exception of Stations TB_31, TB_47, TB_54 and TB_55 where grab sampling was not carried out due to the potential for stony reef). All samples were screened through a 1mm sieve. Before analysing the data set provided by the laboratory, several taxa were removed as per our stated methods (Section 2.11); however all records, regardless of whether they were included in statistical analyses, are listed in **Appendix E**. Rationalisation of the faunal data set as per our stated methods allows inclusion of only those species that are considered to merit practicable and comparable univariate and multivariate statistical analyses.

3.6.2 Summary and Univariate Statistics

In total, 7,902 individuals from 211 taxa were recorded from 51 samples. Juveniles accounted for 795 individuals from 33 taxa, making up 10% of the total individuals and 16% of the total taxa. Although juveniles are a valid part of the community, only a small proportion will survive to maturity. Data sets that include large numbers of juveniles are therefore not necessarily a realistic reflection of the fauna that can be expected year round. In order to test whether juveniles had a significant effect on the structure of the data set, a RELATE analysis was conducted in PRIMER v6. Although two juvenile taxa (Echinoidea juv. and *Ensis* juv.) appear among the top ten most dominant organisms in the data set, results from the RELATE analysis showed that the full data set was 96% similar to the same data set with the juveniles removed. This result indicated that juveniles may not be exerting an influence on the overall community structure and the following analyses were performed using the full data set, which is inclusive of juvenile counts.

The oceanic quahog, *Arctica islandica* was found at six stations (TB_28, TB_36, TB_33, TB_42, TB_51 and TB_52) with a total of nine individuals recorded across Tranche B. *A.islandica* is a long-lived species with a very slow growth rate and is listed on the OSPAR list of threatened and/or declining species and habitats OSPAR, 2008); however, it is commonly found in the North Sea (Oil and Gas UK, 2010). Populations of 40-80 year old specimens have been observed, with a substantial proportion over 100 years old (OSPAR, 2009). Twelve individuals of the invasive crustacean *Monocorophium sextonae* (*Corophium sextonae* synonym) were found at two stations (TB_49 and TB_50).

The initial stage of analysis was the division of the data set into five gross taxonomic groups; Annelida (Polychaeta), Arthropoda (Crustacea), Mollusca, Echinodermata and ‘other taxa’. The other taxa group included Cnidaria (anemones), Nemertea (ribbon worms), Sipuncula (peanut worms), Phoronida (horseshoe worms) and Chordata (ascidians and fish). The absolute and proportional contributions of these five taxonomic

groups to the overall community structure are given in **Table 3.6** and displayed for each station in **Appendix E**.

Table 3.6 Contributions of the Gross Taxonomic Groups

Group	Individuals		Taxa	
	Abundance	Proportional Contribution (%)	Abundance	Proportional Contribution (%)
Annelida (Polychaeta)	5011	63	80	38
Arthropoda (Crustacea)	767	10	48	23
Mollusca	1497	19	54	26
Echinodermata	466	6	16	8
Other	161	2	13	6
Total	**7902**	**100**	**211**	**100**

Overall, the macrofaunal community was dominated by polychaete annelids, contributing 63% of the total individuals and 38% of the total taxa. Molluscs were the second most dominant group, with 19% of the total individuals and 26% of the total taxa, while crustaceans contributed just 10% of individuals and 23% of the taxa. The dominance of polychaete taxa is not unusual. Studies by Gage (2001) show polychaetes consistently dominating soft bottom benthos from continental shelves to abyssal plains and revealed that over 50% of total macrofaunal individuals are generally composed of polychaete worms. Contributions of the gross taxonomic groups at each station are presented in **Appendix E**.

Highest macrofaunal density and diversity was seen at Station TB_49 (413 individuals and 62 taxa). The faunal community at this station was dominated by polychaetes, contributing 74% of individuals and 48% of taxa. Stations TB_30 and TB_18 had the second and third highest faunal density with 316 individuals and 297 individuals, respectively. Molluscs dominated at Station TB_30, contributing 57% of the individuals but just 22% of the taxa; this can be attributed to the high abundance of the bivalve *Kurtiella bidentata* (n=155) at this station. Lowest macrofaunal densities were found at Stations TB_09, TB_10 and TB_21 which recorded 67, 70 and 64 individuals, respectively. The majority of stations (80%) recorded <200 individuals per 0.1m^2. Faunal distributions of the number of individuals and taxa throughout the survey area are presented in **Figure 3.6**.

The top ten most abundant taxa are presented in **Table 3.7**. The most abundant species, with 2,899 individuals identified in all but one of the 51 samples, was the polychaete *Spiophanes bombyx*. *S. bombyx* is commonly found in sublittoral sands and sandy muds (Rees *et al*., 2007) and is known to be tolerant to both smothering and substratum loss and to be intolerant to changes in nutrients (Hiscock *et al.,* 2005). *S. bombyx* was observed to be the most frequently distributed species in the entire North Sea in a pooled data set of the North Sea Benthos Survey and the Ministry of Agriculture, Fisheries and Food cruises (Heip and Craeymeersch, 1995).

Other abundant species (>300 individuals in total) were the mollusc *Angulus fabula* and the polychaete *Lanice conchilega*. *A. fabula* is found at depths of up to 100m in fine and

medium sands (Van Hoey *et al.*, 2004). As a bivalve species which feeds using an inhalant siphon protruding above the sediment surface, smothering would halt feeding and respiration and require *A. fabula* to relocate to its preferred depth. Mortality is unlikely however, therefore the bivalve's sensitivity to smothering is classed as low and its ability to recover is classed as high (Hiscock *et al*., 2002). Although relatively tolerant to smothering, *A. fabula* is intolerant to other forms of physical disturbance such as trawling and highly intolerant to organic enrichment and synthetic chemicals (Hiscock *et al.*, 2004). Its presence in abundance can therefore be an indicator of undisturbed 'clean' sediments. The presence of such species could be useful as indicators of potential disturbance during future monitoring surveys.

L. conchilega is commonly known as the sand mason worm due to its characteristic tube constructed from sand grains and shell fragments. This polychaete requires stable sediments in order to maintain well structured burrows and is also believed to increase macrobenthic diversity and species richness through biostabilisation/bioengineering of sediments via construction of these burrows. This effect is most pronounced in shallow fine sandy sediments. Van Hoey *et al*. (2008) suggested that *L.. conchilega* has relatively little habitat specialisation and thus may be found across most sediment types and a range of depths (<1900m), although there is preference for shallow sandy environments. However, due to inhabiting a permanent tube, this species can be damaged by any activity that penetrates the sediment such as dredging, drilling or beam trawling, although depending on severity of the impact, there is scope for recovery and repair of tubes.

Table 3.7 Top Ten Most Abundant Taxa

Rank by Abundance	Species/Taxon	Number of Stations (%)	Total Abundance
1	*Spiophanes bombyx*	98	2899
2	*Angulus fabula*	84	445
3	*Lanice conchilega*	80	345
4	*Bathyporeia guilliamsoniana*	80	244
5	*Owenia fusiformis*	96	238
6	*Kurtiella bidentata*	35	223
7	Echinoidea juv.	63	188
8	*Ensis* juv.	76	186
9	*Lagis koreni*	71	183
10	*Sigalion mathildae*	86	156

In contrast to the characterising taxa of the survey area, 75 of the 211 taxa (36% of the total taxa) were recorded at a single station and 57 taxa (27% of total taxa) were represented by a single individual. This may be useful as a future indicator of physical disturbance, as under these scenarios it is expected that these taxa would be altered, most likely decreasing to be replaced with high abundances of a limited suite of tolerant species.

Biomass analysis results are presented in detail in **Appendix E** and the distribution of total biomass is presented in **Figure 3.7**. Total biomass was relatively consistent across the survey area, with the majority of stations recording ≤2g AFDW. Highest biomass was found at Station TB_02, with 8.06g AFDW recorded, over 7.9g of which was contributed

by echinoderms. Review of the raw macrofaunal data revealed three individuals of the sea potato *Echinocardium cordatum*, which can grow to considerable sizes.

The data set was further analysed to provide the total number of individuals, the total number of taxa, the Shannon-Wiener diversity index (*H'*) calculated using a logarithm base 2 (Shannon and Weaver, 1949), Simpson's dominance (*λ*) and Pielou's evenness (*J*) for each station. Increasing values for the Shannon-Wiener diversity index correspond to increasing diversity and richness of the community. Values for Simpson's dominance index and Pielou's evenness both range from 0 to 1, with a value of 1 indicating a dominant community for the former and an even community for the latter. The results of further univariate analyses are presented in **Appendix E** and **Figures 3.8** and **3.9**.

The univariate statistics suggest that the faunal community within Tranche B is relatively diverse, with *H'* values at all stations ≥2.40. Highest diversity (*H'* >4.00) was generally found in areas of increased seabed complexity, in particular among the patches of boulder clay and coarse sand across the centre of Tranche B. In general, lower diversity values were found to the east of the survey area. Pielou's evenness values ranged from 0.53 at Station TB_02 to 0.90 at Station TB_15, suggesting considerable variation in evenness across Tranche B. In general, faunal communities across the north and centre of the survey area were relatively even, with lower evenness values concentrated in the east. Highest evenness values coincided with areas of high diversity and low dominance. Simpson's *λ* values ranged from 0.06 at Station TB_15 to 0.40 at Station TB_02 indicating variation in dominance structures. Lower dominance was found in the centre, coinciding with areas of coarser sediment and higher faunal diversity, while highest dominance values were concentrated mainly to the south-east corner of Tranche B, for stations which recorded slightly lower diversity values and were predominantly composed of fine sand.

Figure 3.6 Individual and Taxa Abundance - Tranche B

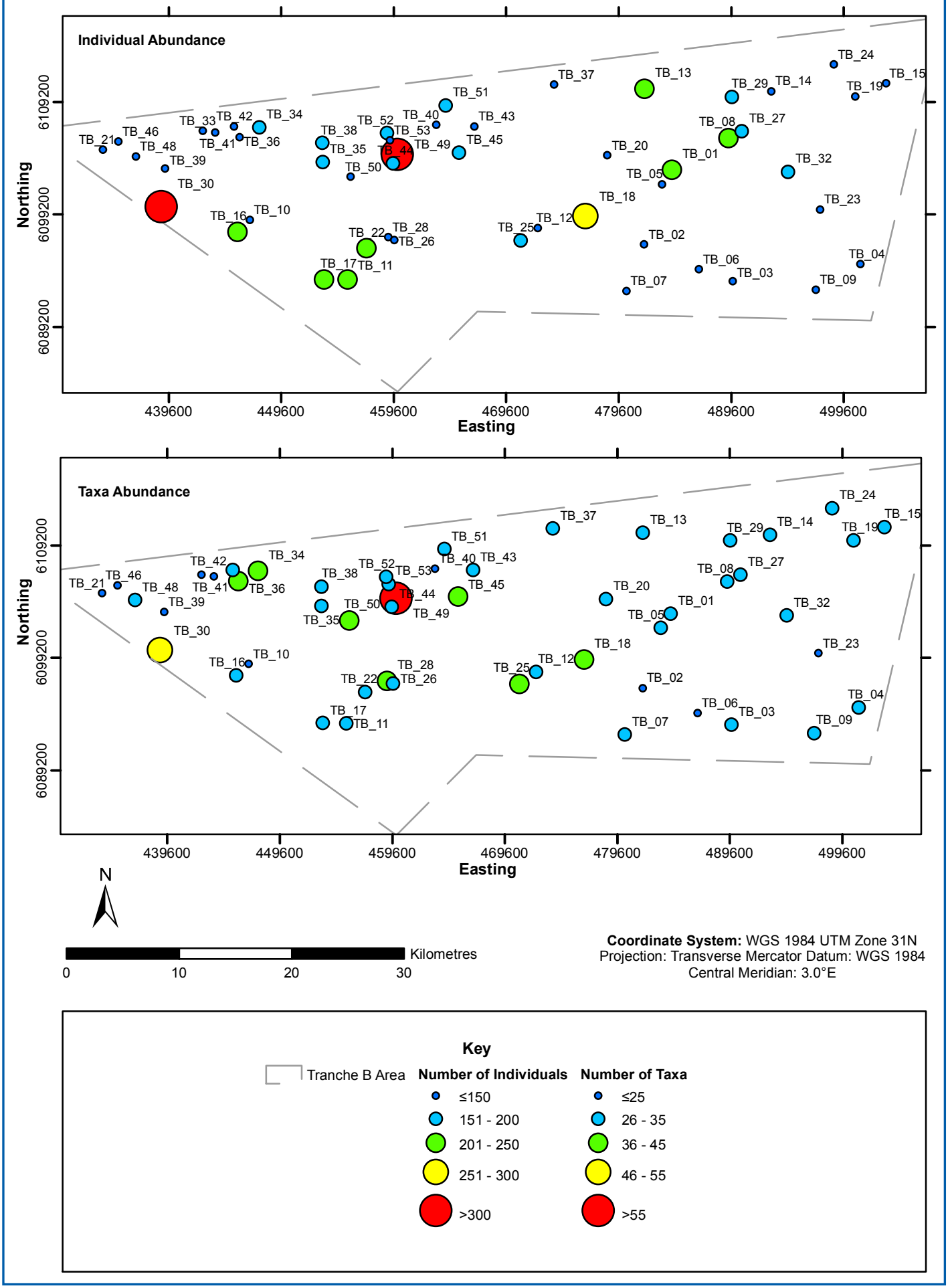


Figure 3.7 Macrofaunal Biomass - Tranche B

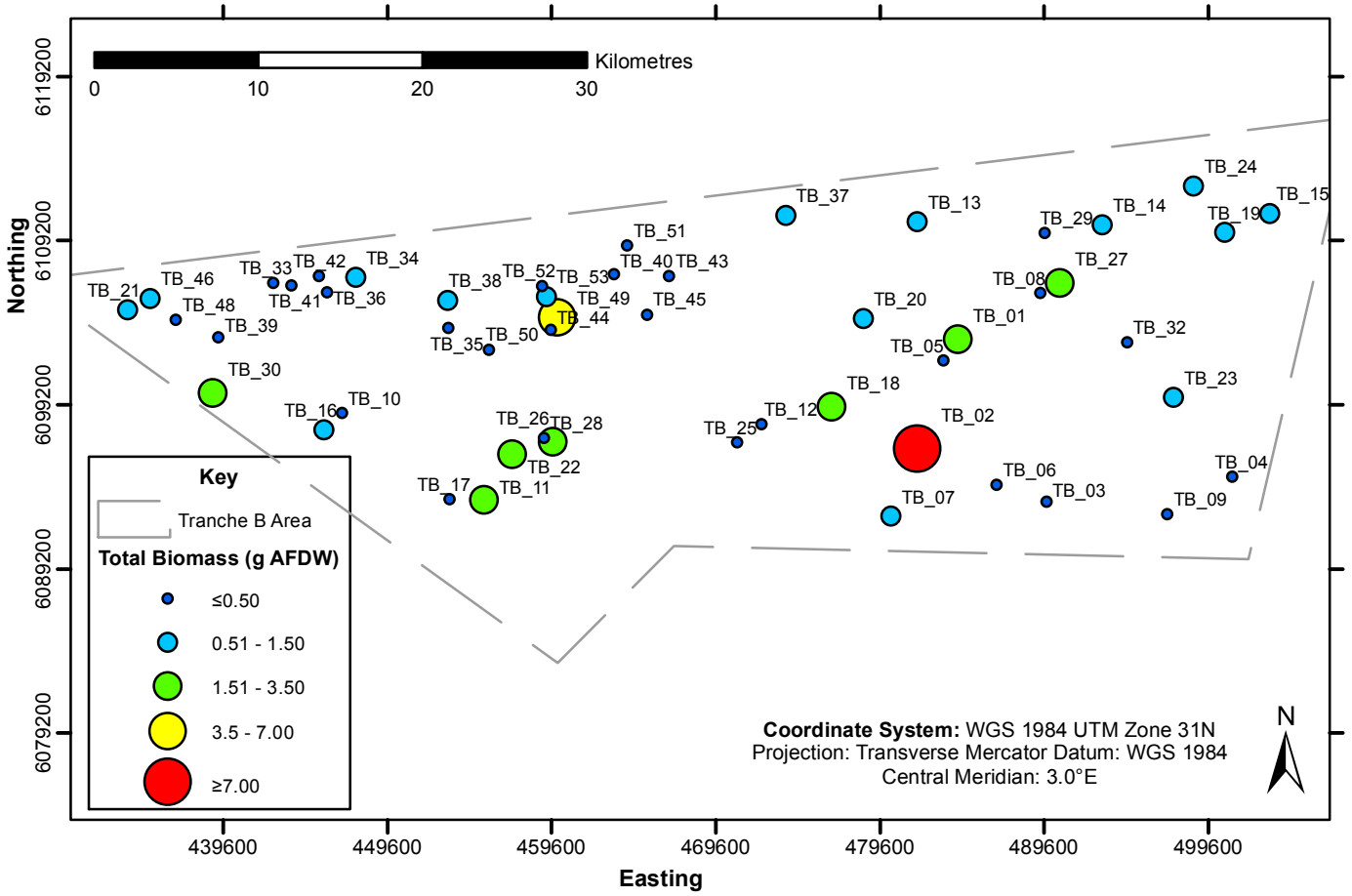


Figure 3.8 Shannon-Wiener Diversity Index - Tranche B

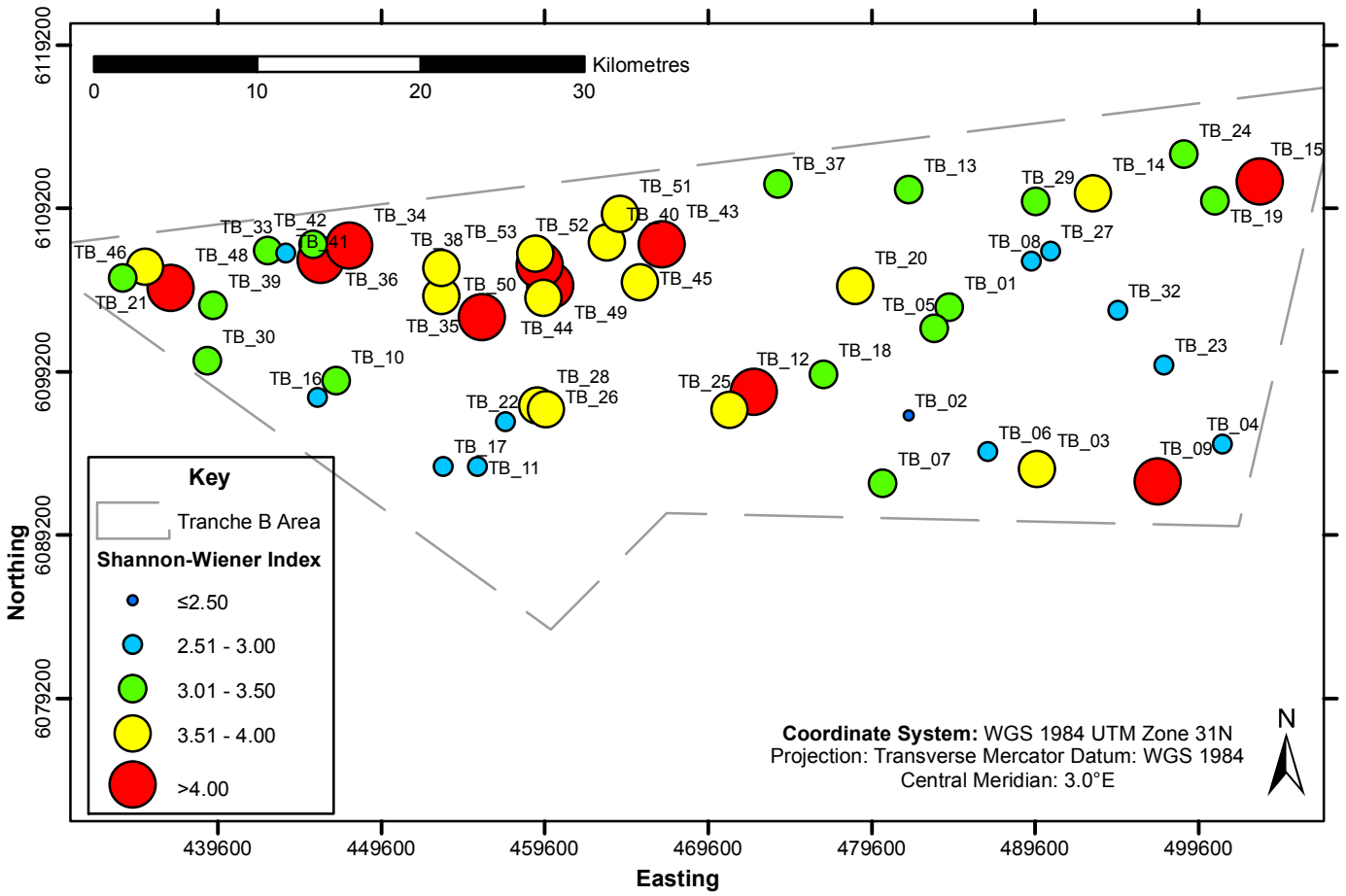
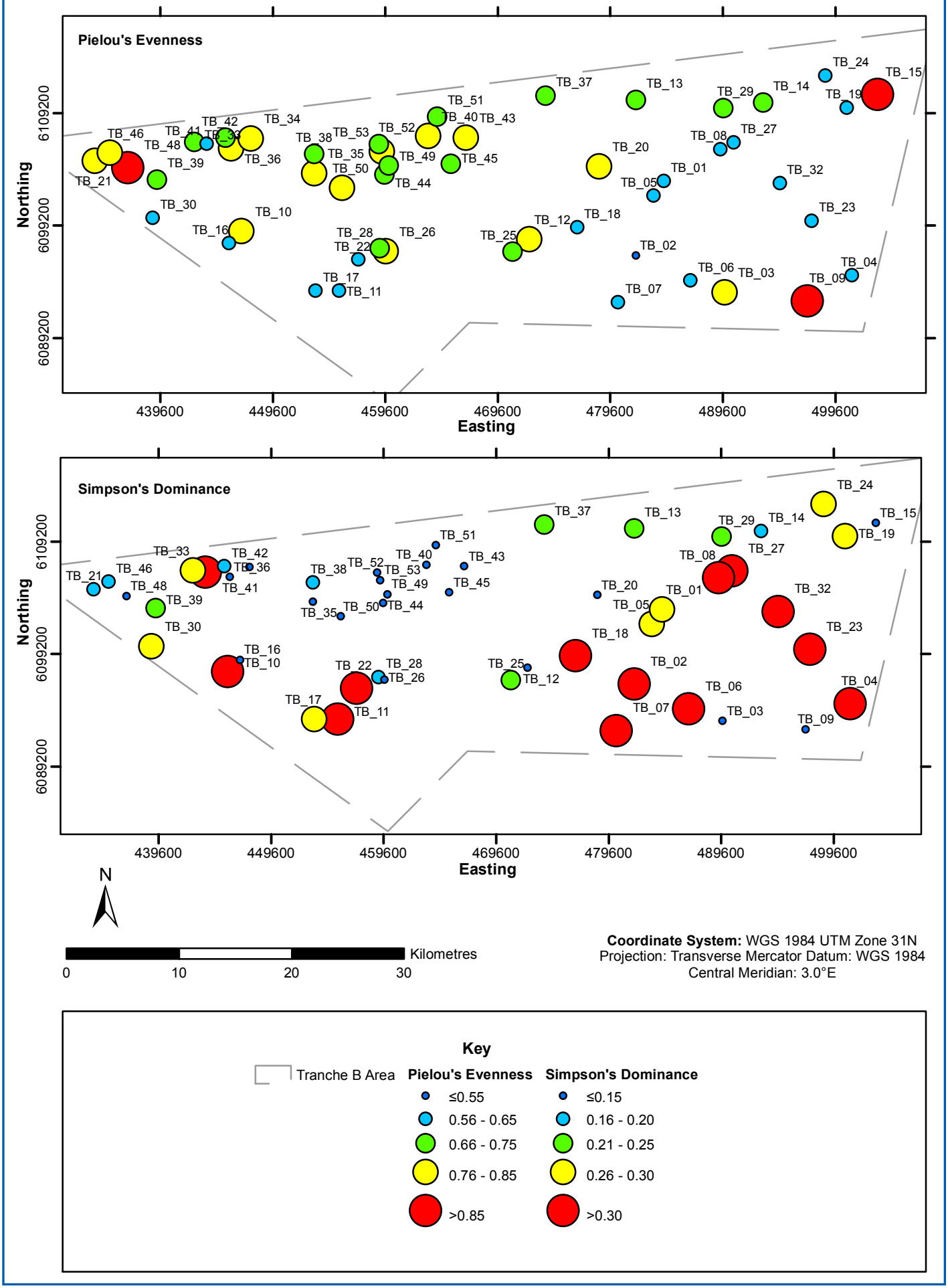


Figure 3.9 Pielou's Evenness and Simpson's Dominance - Tranche B



3.6.3 Multivariate Analyses

In comparison to univariate statistics, multivariate analyses enable subtle trends within data sets to be identified. Multivariate analyses were performed on the rationalised data using PRIMER Version 6 (Clarke and Warwick, 2006). Prior to undertaking analyses, both the full and adult data sets were subjected to a square root transformation, in order to down-weight the influence of the more numerically dominant species. A Bray-Curtis similarity matrix was produced based on the transformed abundance data, from which CLUSTER and MDS routines were performed. The Bray-Curtis similarity dendrogram and MDS plot are presented in **Figure 3.10**.

A SIMPROF permutation test was conducted on the data set in conjunction with the CLUSTER analysis to look for statistically significant evidence of genuine clusters in the community data, and the results are overlain on the dendrogram presented in **Figure 3.10a**. Red lines join stations that were statistically indistinguishable, while black lines join stations which were statistically different from one another.

The analyses identified two main groups of stations grouped at a similarity of *c.*43%; one group (Cluster h) containing Stations TB_30, TB_48 to TB_50 and TB_53 and the second group containing all other stations, separated further into six clusters and one statistically distinct station. Within Cluster h, all stations were statistically indistinguishable. Within the second group, Station TB_10 was identified as statistically distinct from all other stations, and six distinct clusters (Clusters b to g) were identified. The MDS ordination with overlain SIMPROF groups as symbols (**Figure 3.10b**) further represents the similarities between the stations. Clusters b to g and Station TB_10 are grouped tightly while group h is grouped more loosely. An inset figure shows the distribution of stations within Clusters a to g. With a stress value of 0.04, the MDS ordination can be considered an almost perfect representation of rank similarities.

The distribution of the faunal Bray-Curtis clusters across Tranche B is presented in **Figure 3.11**. It is apparent that differences within the data set and associated groupings are due to the species composition of the retained samples at each station. A SIMPER analysis was carried out in conjunction with examination of the raw data in order to establish the primary taxa which may explain the separation of the clusters as well as those that contribute to statistical significance within clusters. The top four contributing taxa to within-cluster similarities are given in **Table 3.8**.

Notably, *S. bombyx,* the most abundant species within the Tranche B survey was identified as the most influential species in Clusters b through to g. *A. fabula*, the second most common species across the survey, was identified as one of the top four influential species in clusters d to g. These results suggest that a relatively even distribution of the most dominant taxa across most of Tranche B. In contrast, the top three most influential taxa within cluster h belonged to the genus *Spirobranchus*. Abundances of *S. bombyx* were the lowest observed across the survey area, and *A. fabula* was absent from these five stations. *Spirobranchus* are tube-building polychaetes which encrust pebbles, cobbles and rock surfaces, while *S. bombyx* is common to sandy and muddy sediments. The MDS ordination overlain with the Modified Folk results (**Figure 3.12**) revealed that stations

belonging to cluster h (Stations TB_30, TB_48 to TB_50 and TB_53) were classified as muddy sandy gravel, sandy gravel or gravel, sampled in areas of exposures of boulder clay while all stations within clusters b to g were classified as slightly gravelly sand or gravelly sand. Distributions of *S. bombyx, A. fibula, S. lamarcki* and *S. triqueter* across the Tranche B survey area, along with MDS ordinations overlain with bubbles representing species abundance are presented in **Figures 3.13** to **3.16**.

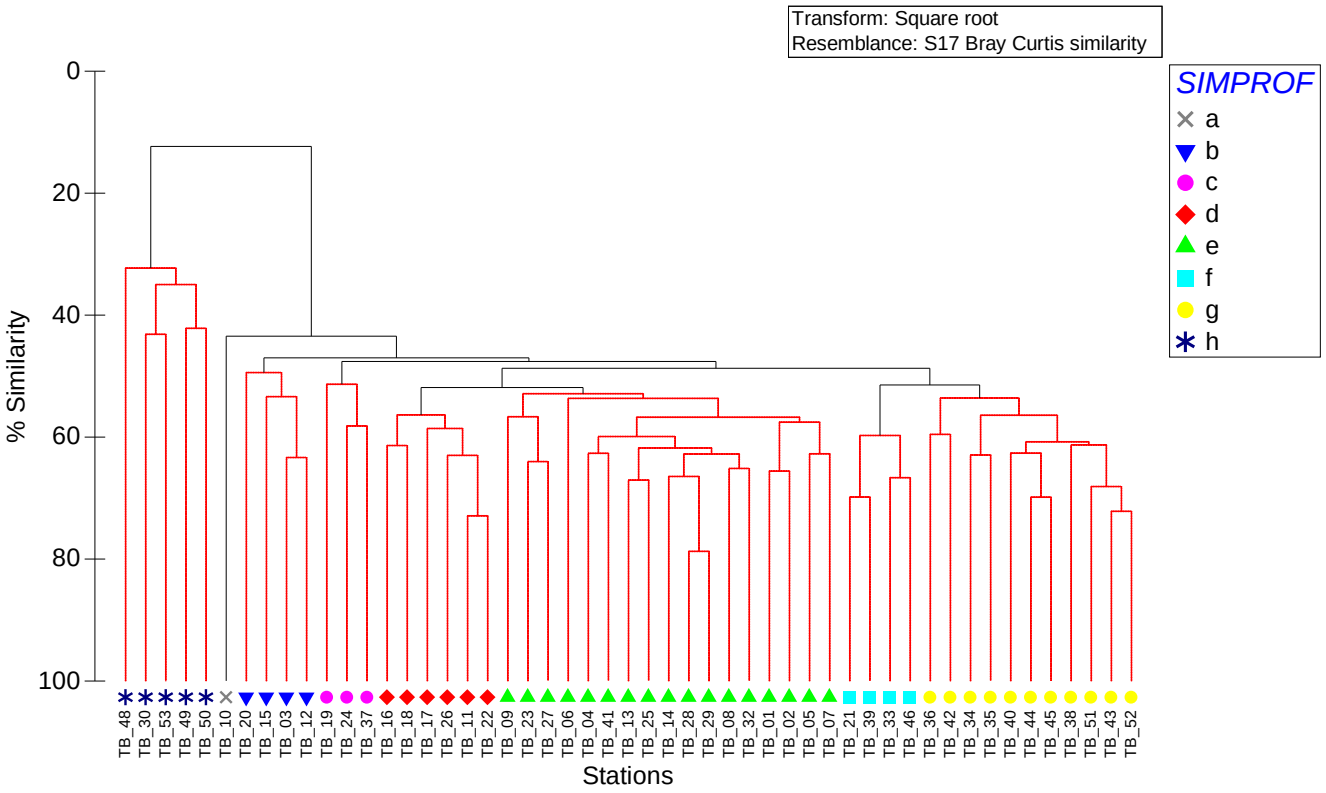
Table 3.8 Similarities within Faunal Bray-Curtis Clusters (SIMPER)

Cluster	Number of Stations	Water Depths (m LAT)	Predominant Sediments	Dominant Taxa	Cumulative Contribution to similarities (%)
b	4	23-27	Sand and gravelly sand	*Spiophanes bombyx* *Bathyporeia guilliamsoniana* *Sigalion mathildae* Edwardsiidae	16.11 24.39 31.05 37.34
c	3	26-30	Gravelly sand	*Spiophanes bombyx* *Lanice conchilega* Echinoidea juv. *Owenia fusiformis*	29.51 39.14 47.78 55.65
d	6	26-29	Sand and gravelly sand	*Spiophanes bombyx* *Angulus fabula* *Lanice conchilega* *Magelona filiformis*	23.24 31.90 39.29 45.43
e	17	23-33	Sand and gravelly sand	*Spiophanes bombyx* *Bathyporeia guilliamsoniana* *Angulus fabula* *Sigalion mathildae*	27.10 35.08 41.22 47.24
f	4	29-34	Sand	*Spiophanes bombyx* *Angulus fabula* *Nephtys* juv. *Owenia fusiformis*	23.18 32.34 39.18 45.94
g	11	30-36	Sand and gravelly sand	*Spiophanes bombyx* *Angulus fabula* *Lanice conchilega* *Ensis* juv.	17.33 27.60 35.07 42.36
h	5	28-34	Sandy gravel, gravel and muddy sandy gravel	*Spirobranchus* *Spirobranchus triqueter* *Spirobranchus lamarcki* *Pholoe baltica*	12.58 20.84 26.08 31.12

A combination of the most abundant aforementioned taxa, and taxa with lower abundances but more even distributions, are responsible for dissimilarities between clusters. Station TB_10 (SIMPROF outlier a) was separated from clusters b to g due mainly to a comparatively low abundance of *S. bombyx*, an absence of *O. fusiformis* and relatively high abundances of molluscs *Ensis* juv. and *Angulus fabula*.

Figure 3.10 Multivariate Analyses of Faunal Data

a) Bray-Curtis Similarity Dendrogram



b) MDS Ordination

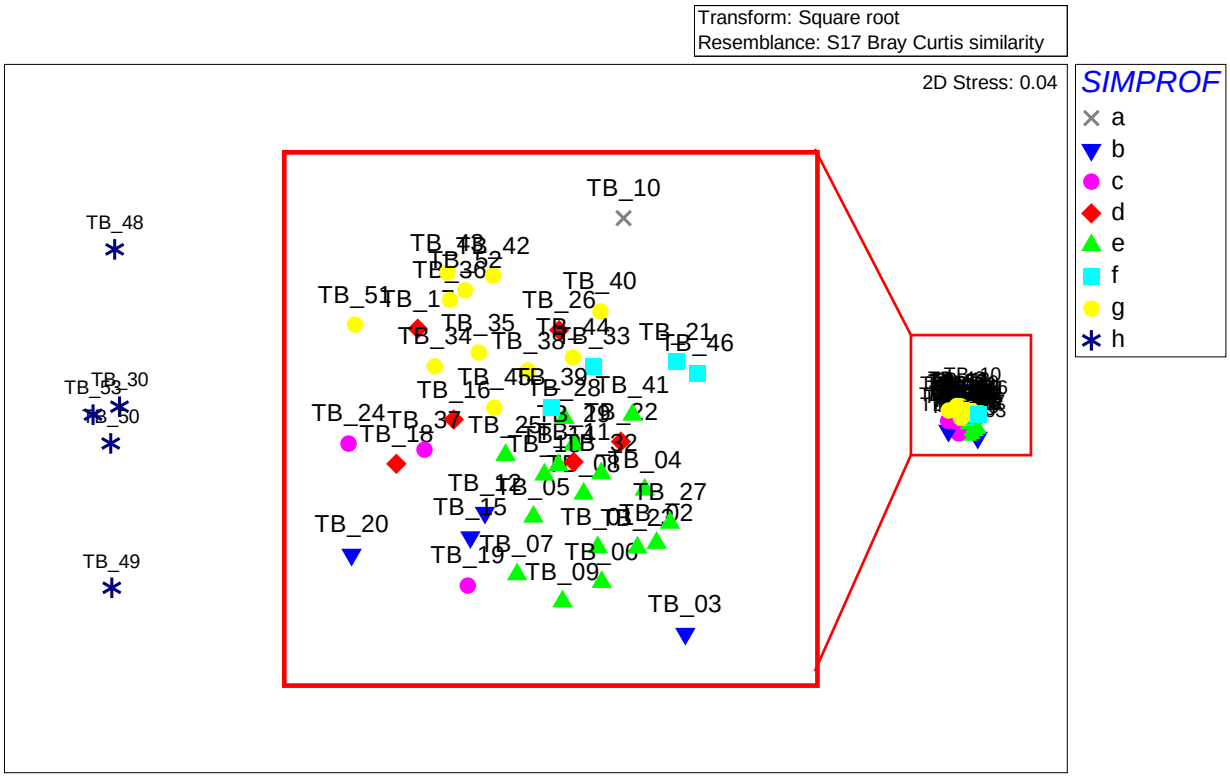


Figure 3.11 Distribution of SIMPROF Groups - Tranche B

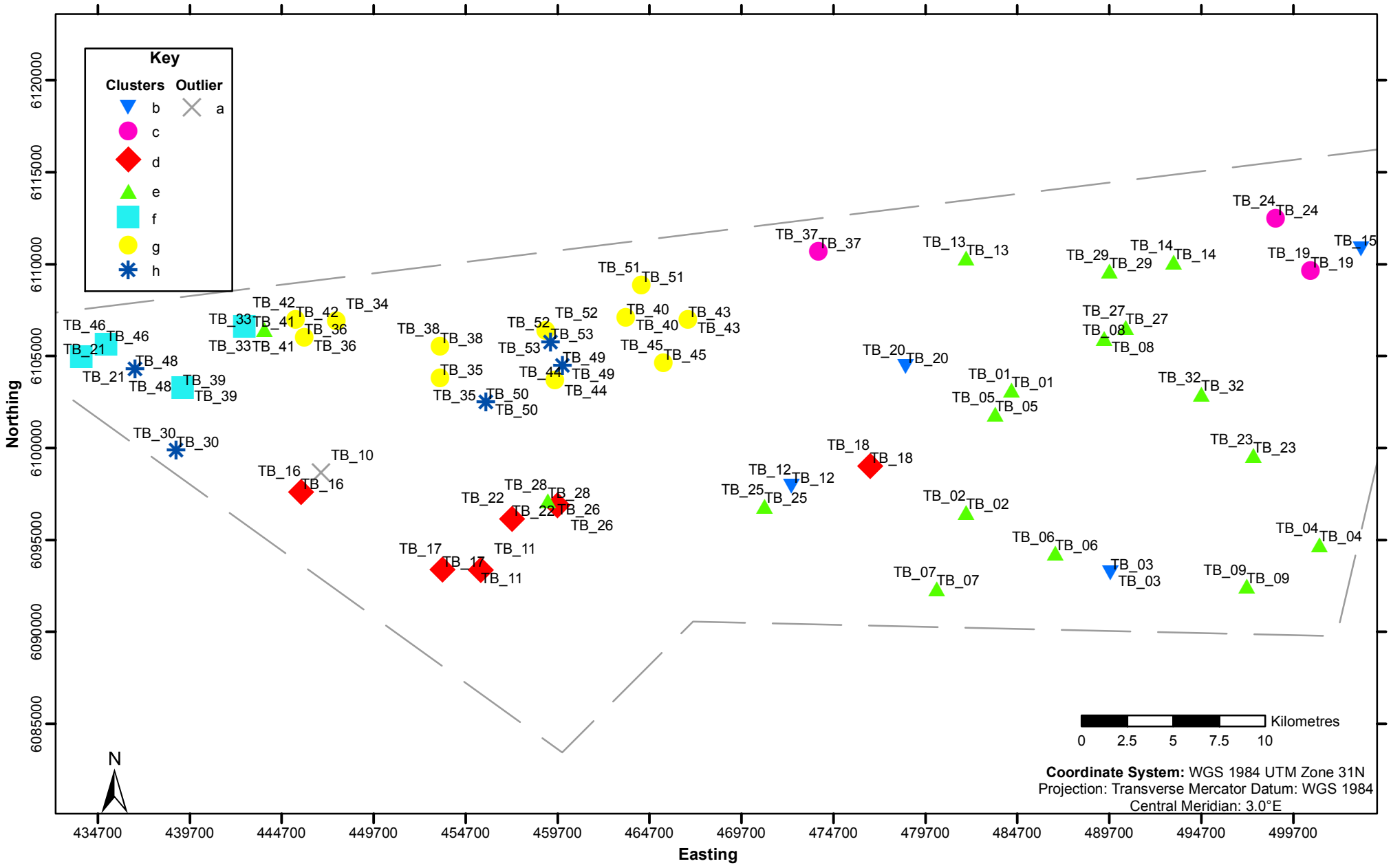


Figure 3.12 Fauna MDS Ordination Overlain with Modified Folk Classification

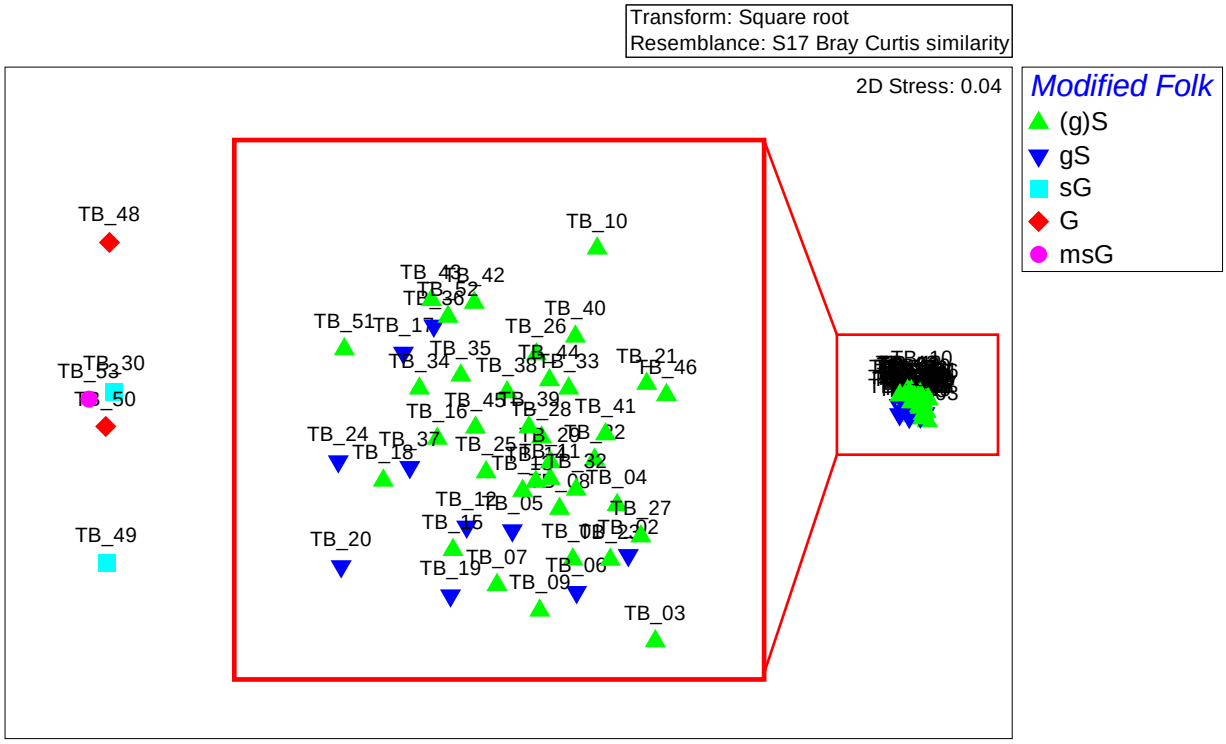
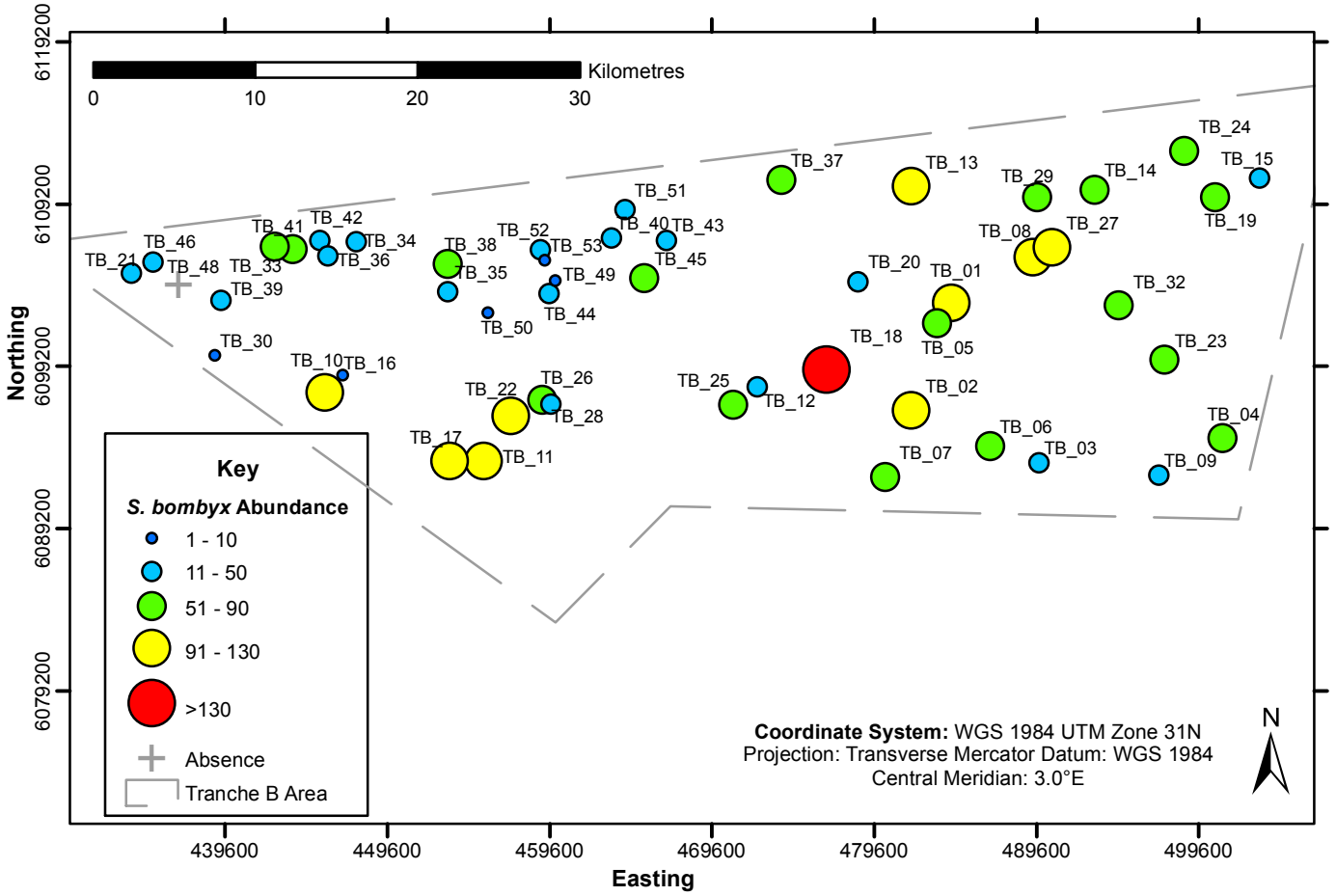


Figure 3.13 Distribution and abundance of *Spiophanes bombyx*

a) Abundance



b) Bubble Plot

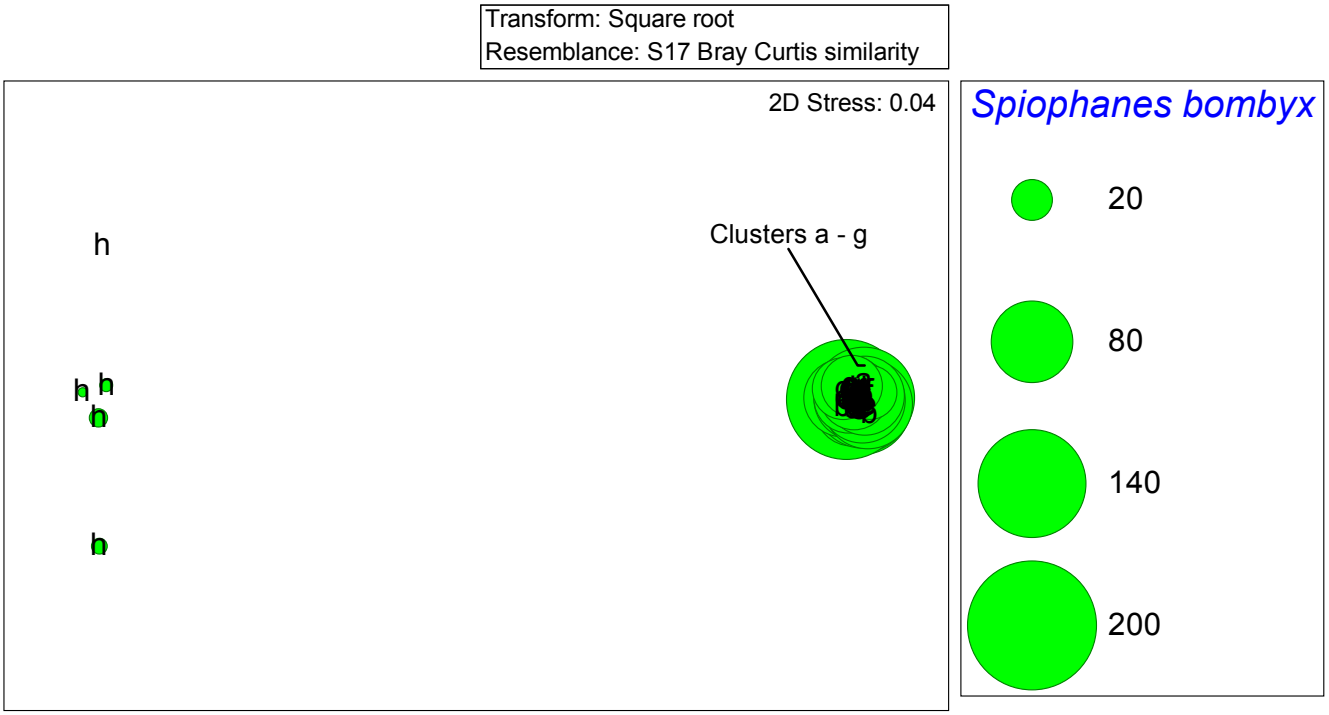
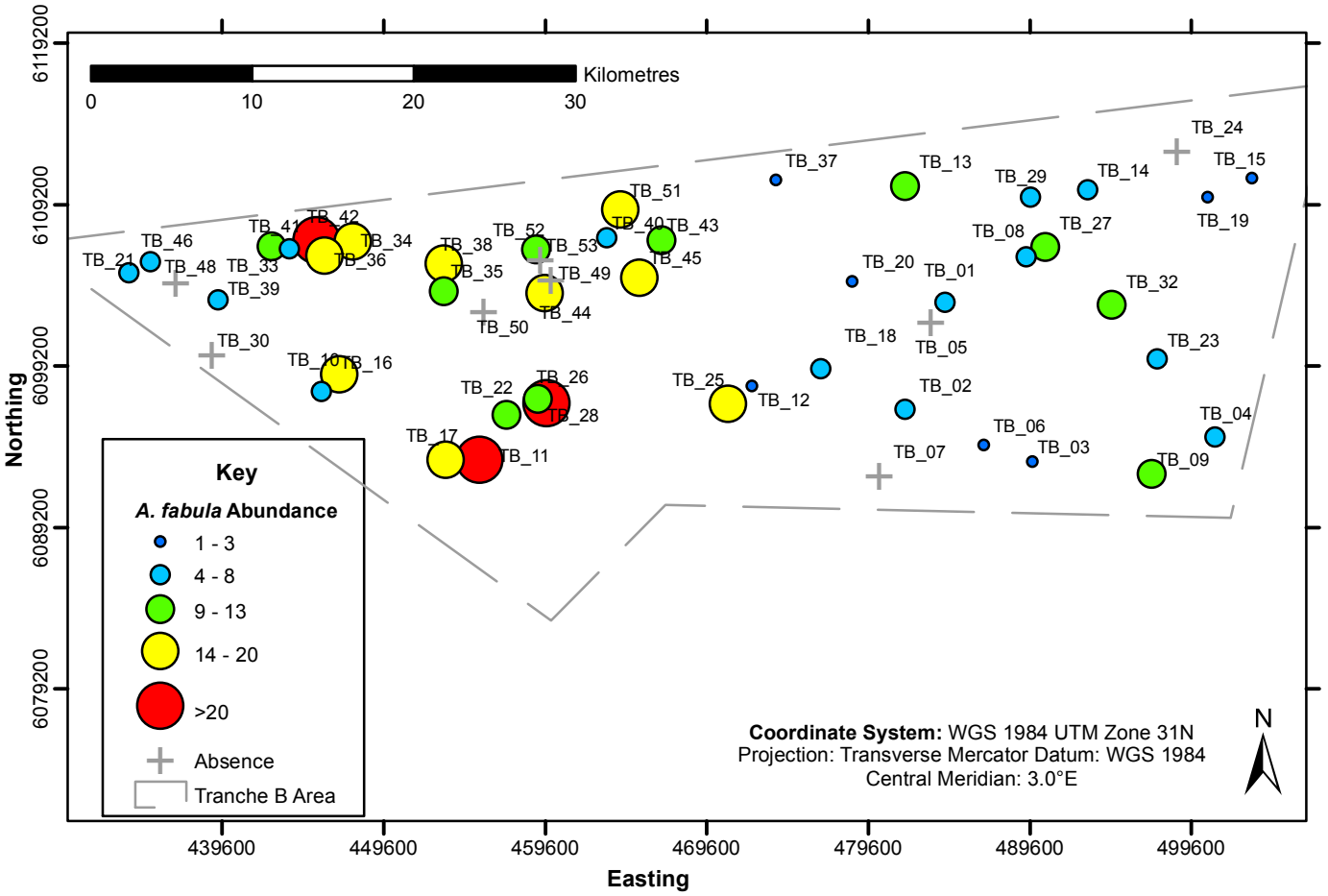


Figure 3.14 Distribution and abundance of *Angulus fabula*

a) Abundance



b) Bubble Plot

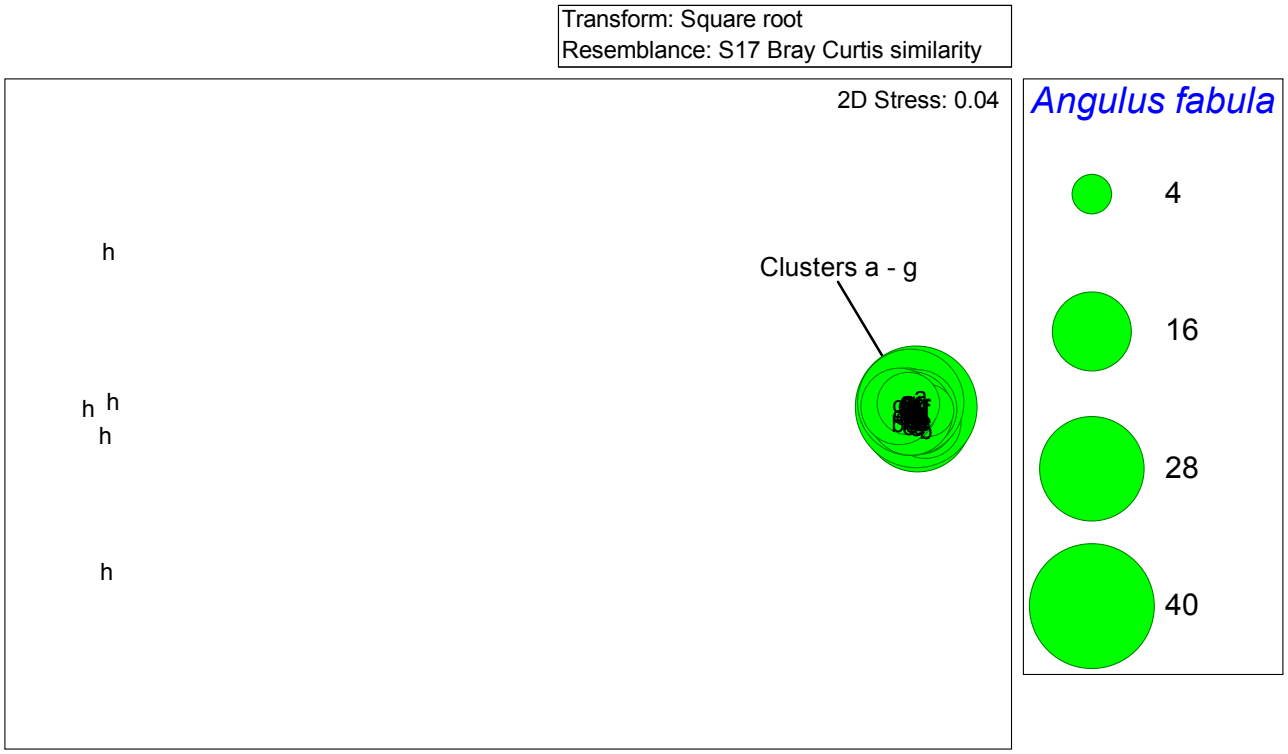
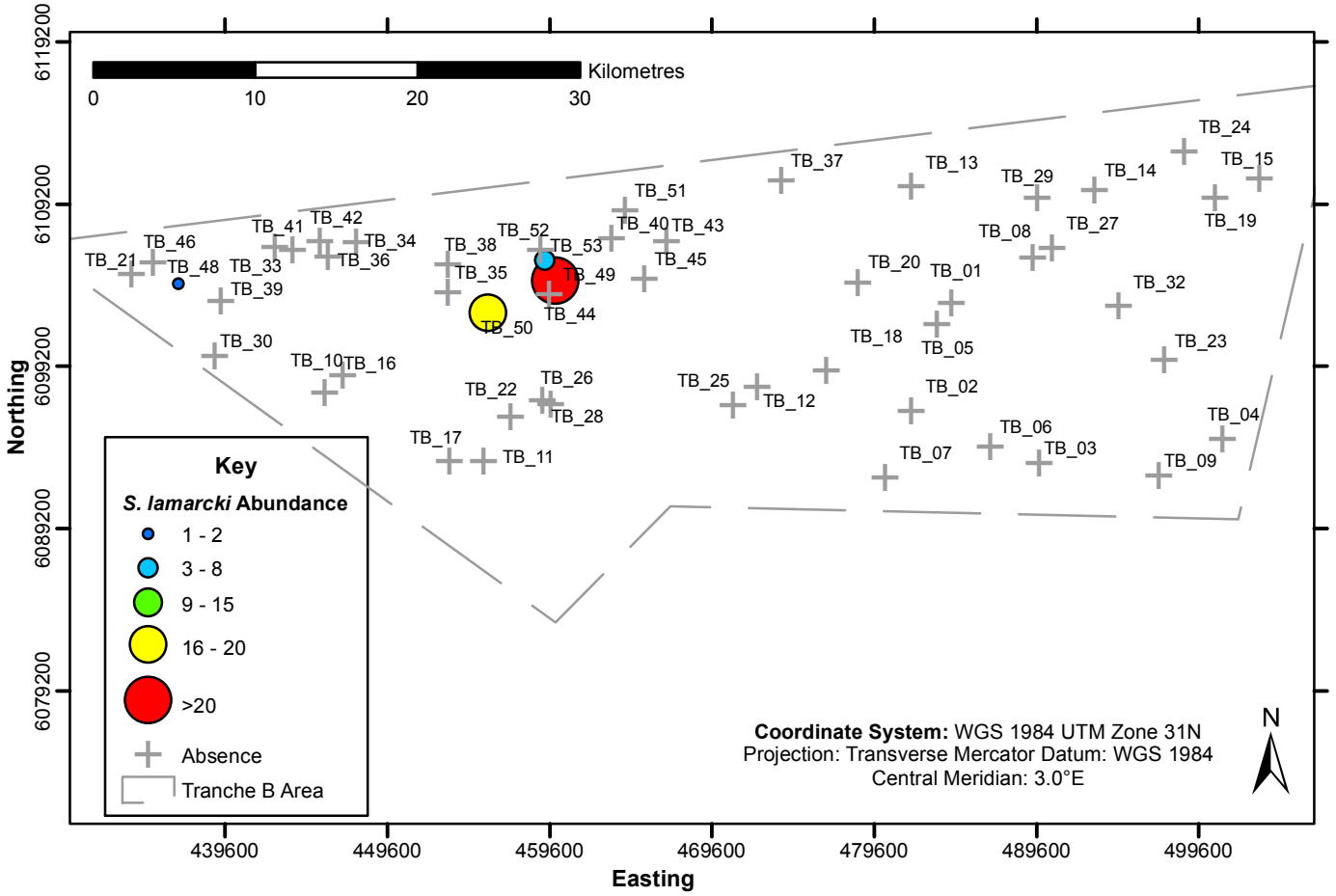


Figure 3.15 Distribution and abundance of *Spirobranchus lamarcki*

a) Abundance



b) Bubble Plot

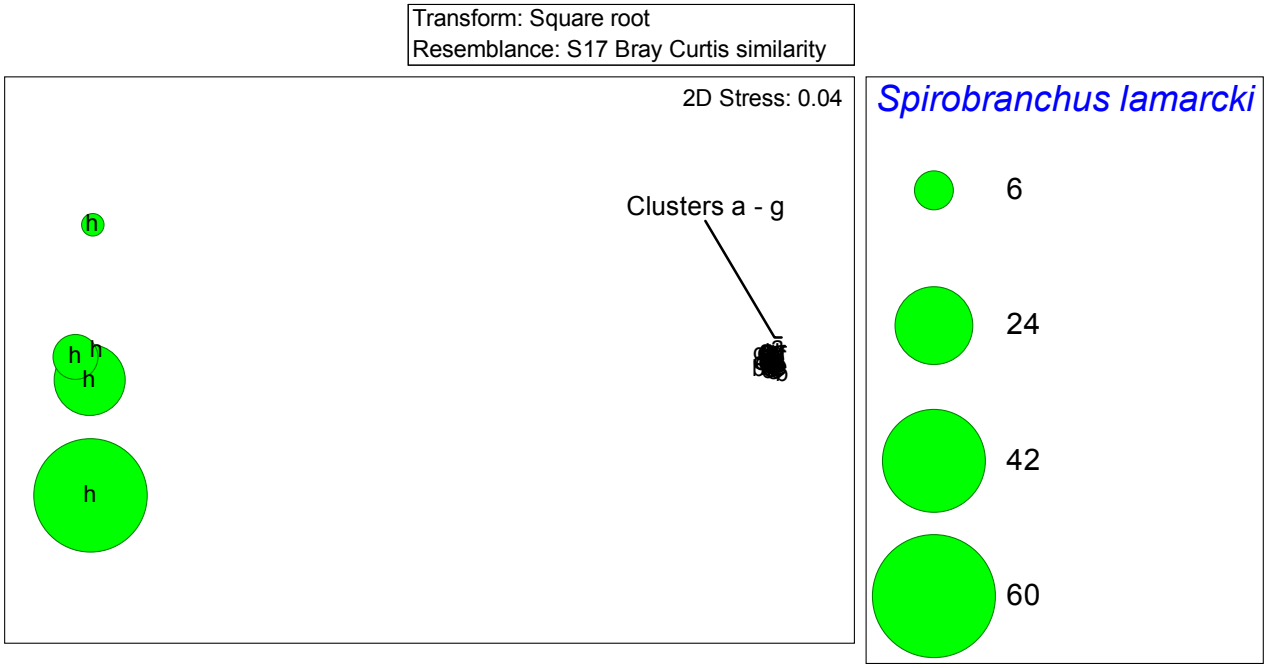
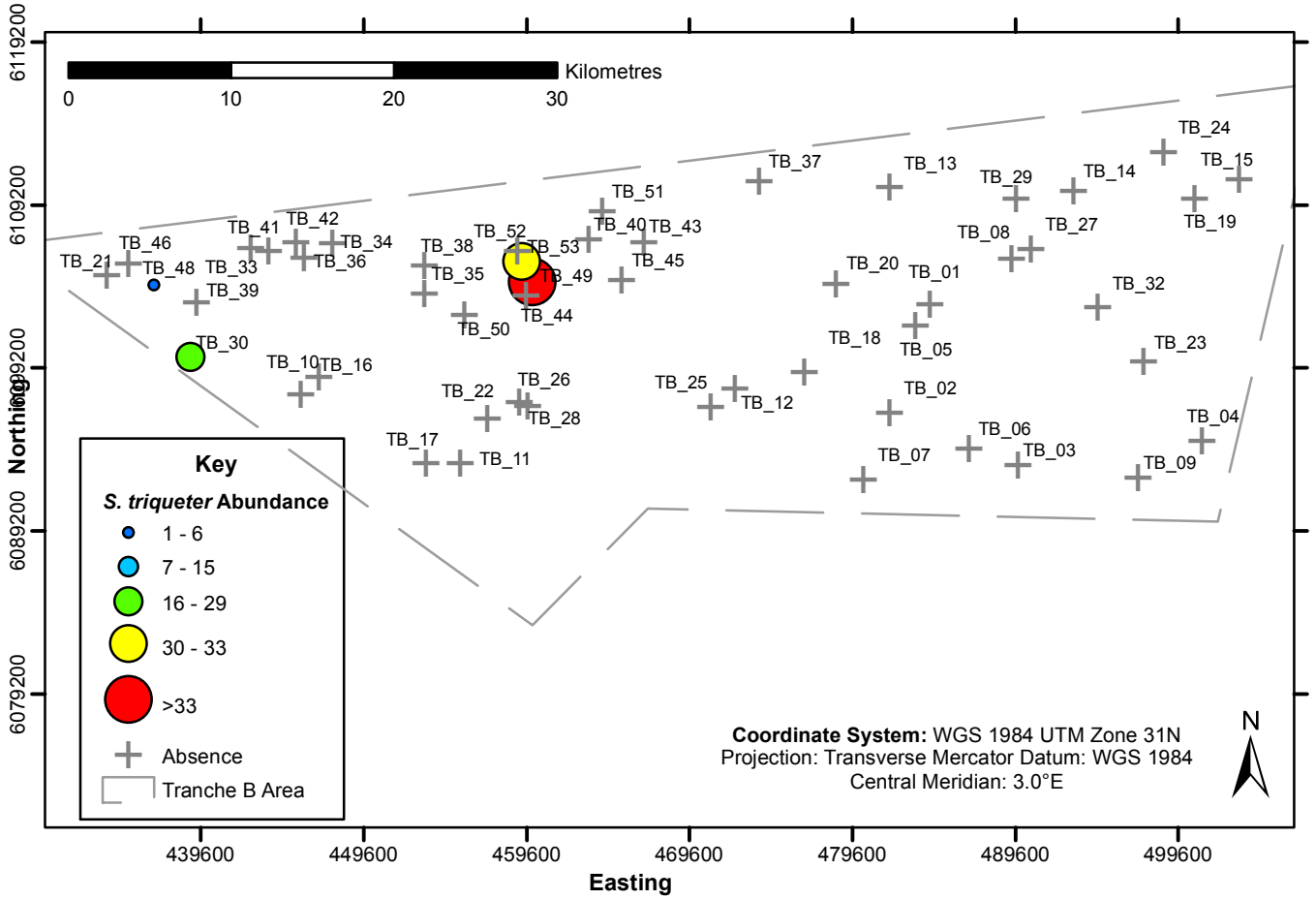
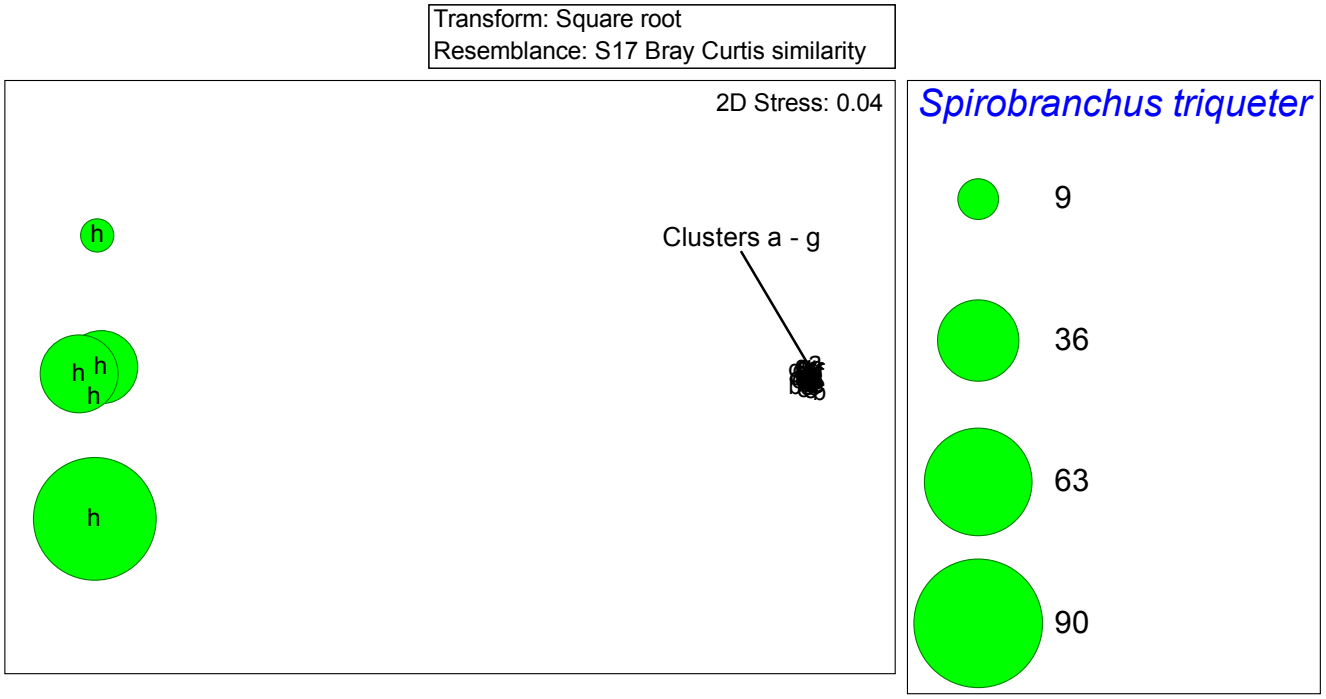


Figure 3.16 Distribution and abundance of *Spirobranchus triqueter*

a) Abundance



b) Bubble Plot



3.7 Biotope Classification

Sediments within Tranche B have been classified following the top-down approach given by Connor *et al.* (2004) into biotope complexes (EUNIS Level 4) using analysis of geophysical data, seabed imagery, PSA and macrofaunal community composition. Where possible, further classification to biotopes (EUNIS Level 5) has been attempted. Detailed notes on each station are presented in **Appendix G**. Distribution of the biotope classifications for each station has been overlain on the seabed features identified by the geophysical survey (**Figure 3.17**).

Water depths (reduced to m LAT) at all stations ranged from between 23m and 37m and as such placed all stations within the sublittoral zone. Together with the range of sediments recorded from seabed imagery analysis and the PSA results, all stations were initially classified as sublittoral sediments (A5 or SS; EUNIS Level 2). Based on the sediment characteristics and associated faunal assemblages, further classification was taken to Level 4 for all stations.

The main biotope complexes identified to EUNIS Level 4 and Level 5 are detailed below (descriptions from Connor *et al.,* 2004) and are summarised in **Table 3.9**.

Table 3.9 Summary of Biotope Classification Including Mosaics

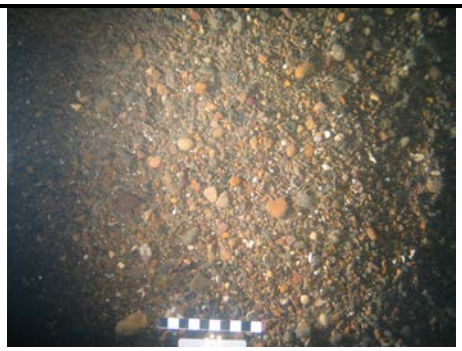
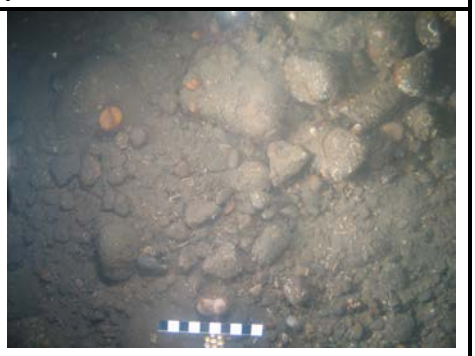
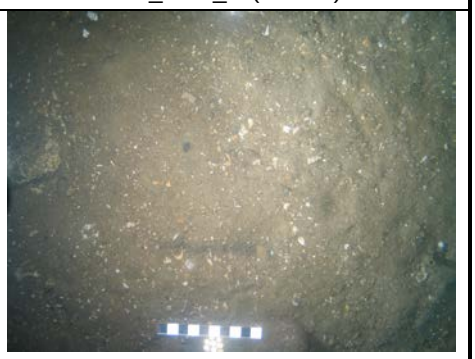
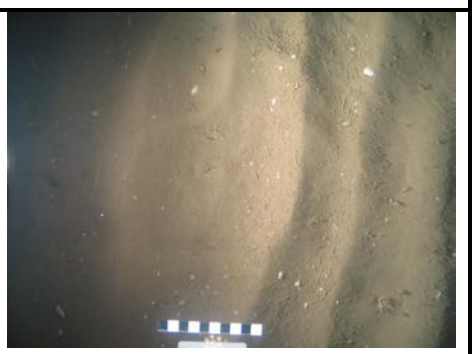
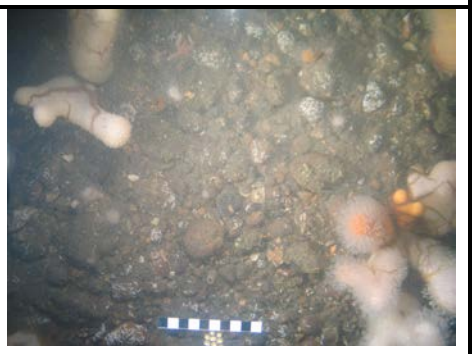
EUNIS/JNCC Code and Name	Number of stations (n= 55)	Representative Seabed Image
Biotope Complex (EUNIS Level 4)		
EUNIS: A5.25 **JNCC: SS.SSa.CFiSa** Circalittoral fine sand	27	 TB_CAM_22 (Fix 569)
EUNIS: A5.14 **JNCC: SS.SCS.CCS** Circalittoral coarse sediment	2	 TB_CAM_48 (Fix 23)

Table 3.9 Summary of Biotope Classification Including Mosaics Continued

EUNIS/JNCC Code and Name	Number of stations (n= 55)	Representative Seabed Image
Biotope Complex (EUNIS Level 4)		
EUNIS: A5.44 **JNCC: SS.SMx.CMx** Circalittoral mixed sediment	5	 TB_CAM_47(Fix 295)
EUNIS: A5.25 with A5.14 **JNCC: SS.SSa.CFi with SS.SCS.CCS** Mosaic of circalittoral fine sand with circalittoral coarse sediment	15	 TB_CAM_28 (Fix 583)
Biotopes (EUNIS Levels 5)		
EUNIS: A5.252 **JNCC: SS.SSa.CFiSa.ApriBatPo** *Abra prismatica, Bathyporeia elegans* and polychaetes in circalittoral fine sand	4	 TB_CAM_33 (Fix 72)
EUNIS: A5.141 **JNCC: SS.SCS.CCS.PomB** *Pomatoceros triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles	2	 TB_CAM_49 (Fix 194)

A5.25 Circalittoral Fine Sand

This biotope complex is generally found in depths of 10 to 50m and may extend offshore. It is characterised by clean fine sands with less than 5% silt/clay and a wide range of echinoderms (in some areas including the pea urchin *Echinocyamus pusillus*), polychaetes and bivalves. This habitat is generally more stable than shallower infralittoral sands and consequently supports a more diverse community. Of the 14 taxa listed as characteristic for this biotope complex, polychaetes *Nephtys*, *S. bombyx* and *L. conchilega*, echinoderms *A. rubens* and *Ophiura* and hermit crabs Paguridae were frequently found across stations classified as circalittoral fine sand. Though faunal abundances were often low it is considered a relatively strong fit when coupled with supportive PSA data.

A*5.14 Circalittoral Coarse Sediment*

Tide-swept circalittoral coarse sand, gravel and shingle are generally found in depths of over 15-20m and can also be found offshore. The substratum consists of coarse sand and gravel with a minor finer sand fraction and the fauna may be characterised by robust infaunal polychaetes, mobile crustaceans and bivalves. Thirty-one taxa are listed as characteristic for this biotope complex. Of these, the polychaetes *Spirobranchus* (previously *Pomatoceros*) and *Mediomastus fragilis*, the echinoderm *A. rubens* and hermit crabs Paguridae were found at stations classified as circalittoral coarse sediment.

A5.44 Circalittoral Mixed Sediment

This biotope complex is generally found in depths of 5 to 50m and may include well mixed muddy gravelly sands or poorly sorted mosaics of shell, cobbles and pebbles embedded in or lying on mud, sand or gravel. Due to the variable nature of the seabed a variety of communities can develop which are often very diverse. A wide range of infaunal polychaetes, bivalves and echinoderms are often present and the presence of hard substrata (shells and stones) enables epifaunal species such as hydroids to become established. Connor *et al.* (2004) notes that the faunal composition of this biotope may be similar to that found in sublittoral coarse sediment complexes.

A5.25 with A5.14 Mosaic of Circalittoral Fine Sand with Circalittoral Coarse Sediment

Where characterising features of both circalittoral fine sand and coarse sediment were identified, these stations were classified as a mosaic of both classifications.

A5.252 *Abra Prismatica, Bathyporeia Elegan*s and Polychaetes in Circalittoral Fine Sand

This biotope is found in circalittoral and offshore fine to medium sands between 25m and100m depth. The faunal community is characterised by the bivalve *A. prismatica*, the amphipod *B. elegans* and polychates such as *S. bombyx, Chaetozone setosa* and *Scoloplos armiger.* The brittlestar *Amphiura filiformis* may also be common. This biotope has been reported in the central and northern North Sea (Eleftheriou and Basford, 1989).

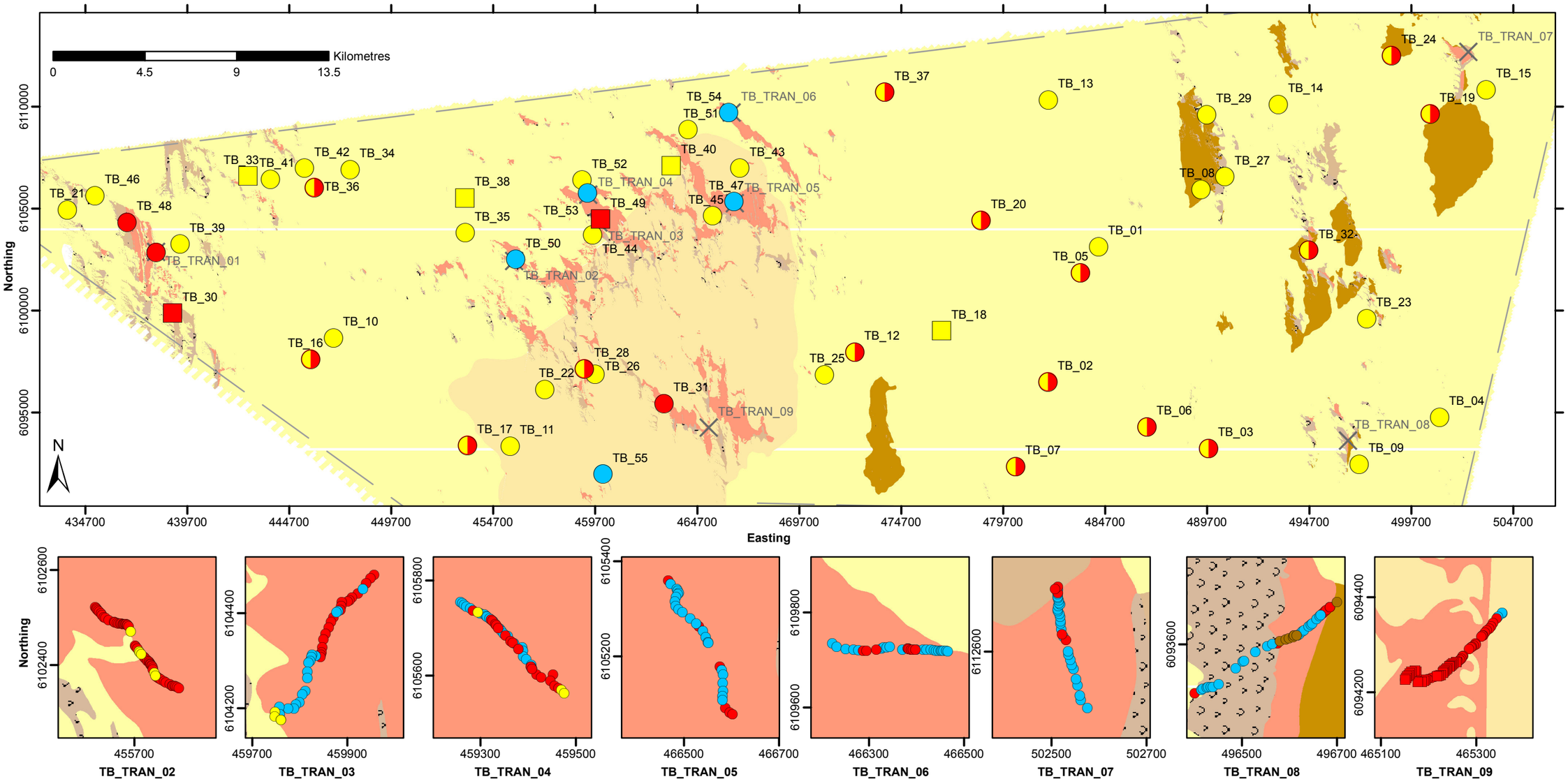
A5.141 *Pomatoceros Triqueter with Barnacles and bryozoan crusts on unstable Circalittoral cobbles and pebbles*

This biotope is found in depths of 5 to 50m and is characterised by a few robust and/or fast growing ephemeral species which are able to colonise pebbles and unstable cobbles

which are regularly moved by wave and tidal action. The main cover organisms tend to be restricted to calcareous tube worms such as *Spirobranchus triqueter* and *S. lamarcki* (previously known as *Pomatoceros*), small barnacles, bryozoan and coralline crusts. Scour action from the mobile substratum prevents colonisation by more delicate species.

Additional camera transects (TB_TRAN_01 to 09), carried out to assess areas of Tranche B for resemblance to stony reef were also included in the EUNIS biotope classification. Transects were typically carried out over a larger area and thus passed over several different biotope complexes and biotopes. Mosaics of the biotope complexes outlined in **Table 3.9** were observed and inset maps on **Figure 3.17** show the habitat classification assigned to each camera fix across each transect. At several fixes across TB_TRAN_04, sediments were identified as possible A5.445 (*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment) due to the high densities of *O. fragilis* observed. However, the area was not considered to be extensive enough to constitute a true brittlestar bed. Detailed notes on the biotope classification of each transect are presented in **Appendix G**.

Figure 3.17 Biotope Classification - Tranche B



4 RESULTS AND DISCUSSION -TEESSIDE CABLE CORRIDOR

4.1 Geophysical Survey Summary

4.1.1 Bathymetry

Water depths along the Northern Route varied from 0.9m LAT to 88.2m LAT with a maximum gradient of 36.0° at KP1.6 on the Option 2 cable route. Within areas of outcropping mudstone bedrock, the seabed is highly irregular in nature and significant gradients occur. Along the Southern Route, water depths varied from 1.0m LAT to 82.1m LAT with a maximum gradient of 18.8° at KP0.85 on the Option 2 cable route

An overview of the bathymetry along the TCC routes is presented in **Figure 4.1**. **Figures 4.2a** to **4.2c** and **Figures 4.3a** to **4.3c** present bathymetry, seabed features and sonar mosaic along the northern route and southern routes, respectively.

4.1.2 Seabed Features

Sidescan sonar (SSS) and magnetometer data were reviewed in conjunction with the bathymetry data in order to infer the sediment type and any potential hazards at the seabed such as wrecks, boulders, debris and infrastructures. Seabed features and sidescan sonar data of the TCC survey area are presented in **Figures 4.2a** to **4.2c** (Northern Route) and **Figures 4.3a** to **4.2c** (Southern Route).

Outcrops of mudstone dominated both corridors up to KP37 on the Northern Route and KP39 on the Southern Route. A veneer of slightly gravelly sand was observed between outcrops. Occasional rock outcrops were then observed up to KP86 on the Northern Route and KP88.5 on the Southern Route. Occasional exposures of till were also observed throughout both routes. Till consists of clay, silt, sand, gravel and boulders ranging widely in size and shape. In general, seabed sediments were predicted to vary from slightly gravelly sand to sandy gravel depending on the influence of the underlying geology. Several trawl scars were observed along the cable corridors on the sonar data, along with several items of linear debris, expected to be related to fishing activity in the area. Sonar, bathymetry and magnetometer anomalies were correlated in order to identify any items of debris or wrecks. Several items of debris and three wrecks were identified.

Figure 4.1 Overview of Teeside Cable Corridor Bathymetry

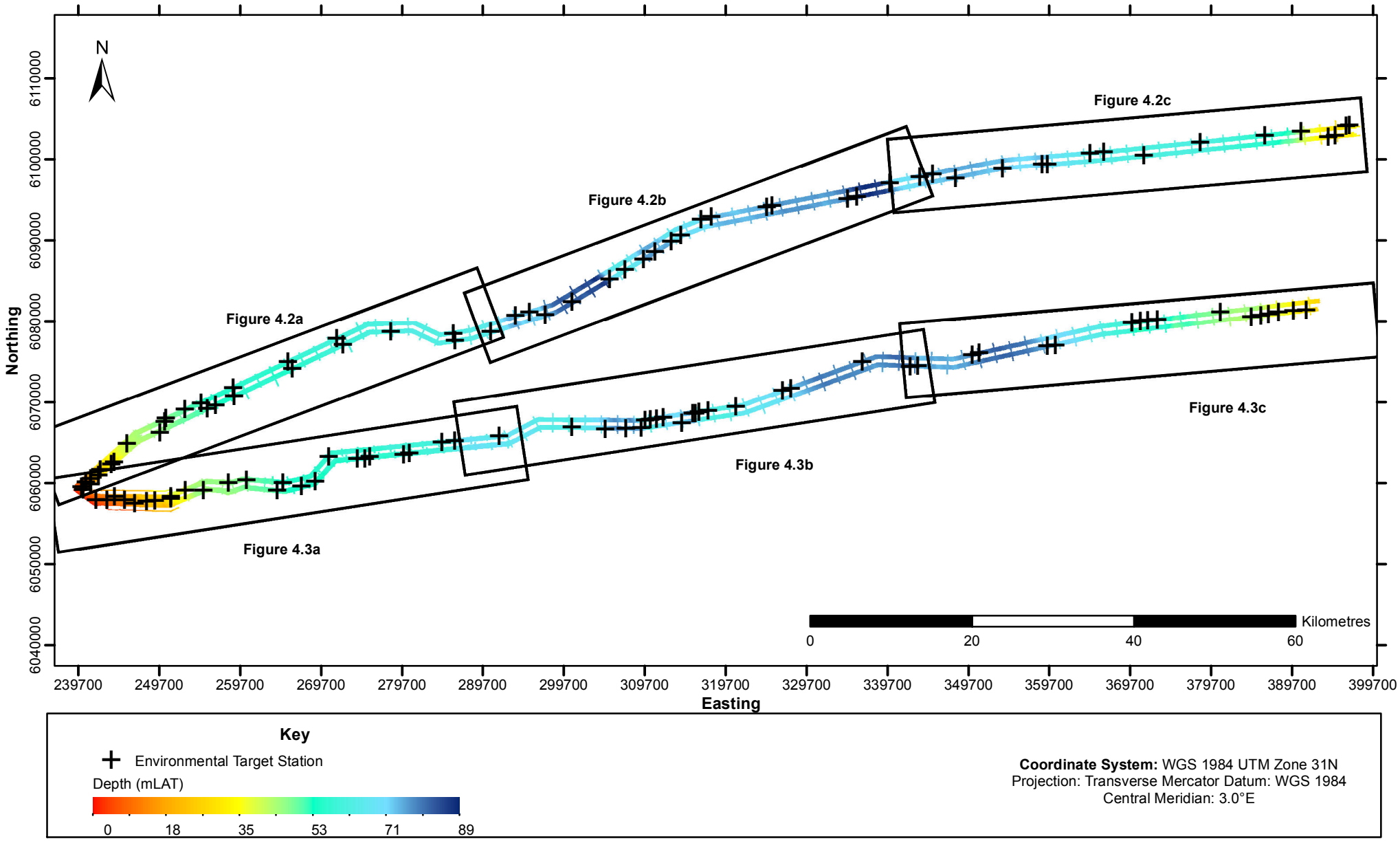


Figure 4.2a Bathymetry, Seabed Features and Sonar Mosaic - TCC Northern Route West

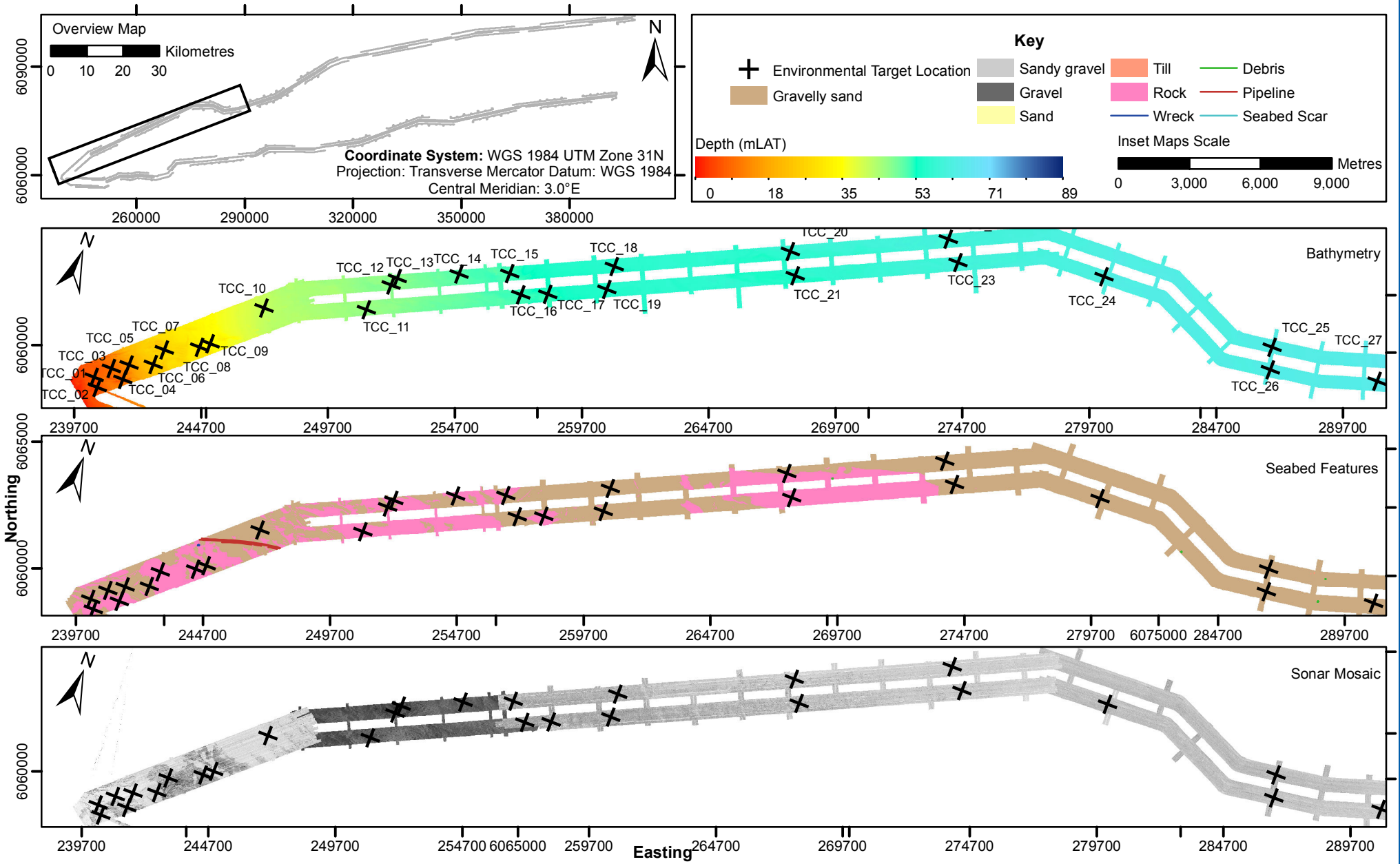


Figure 4.2b Bathymetry, Seabed Features and Sonar Mosaic - TCC Northern Route Centre

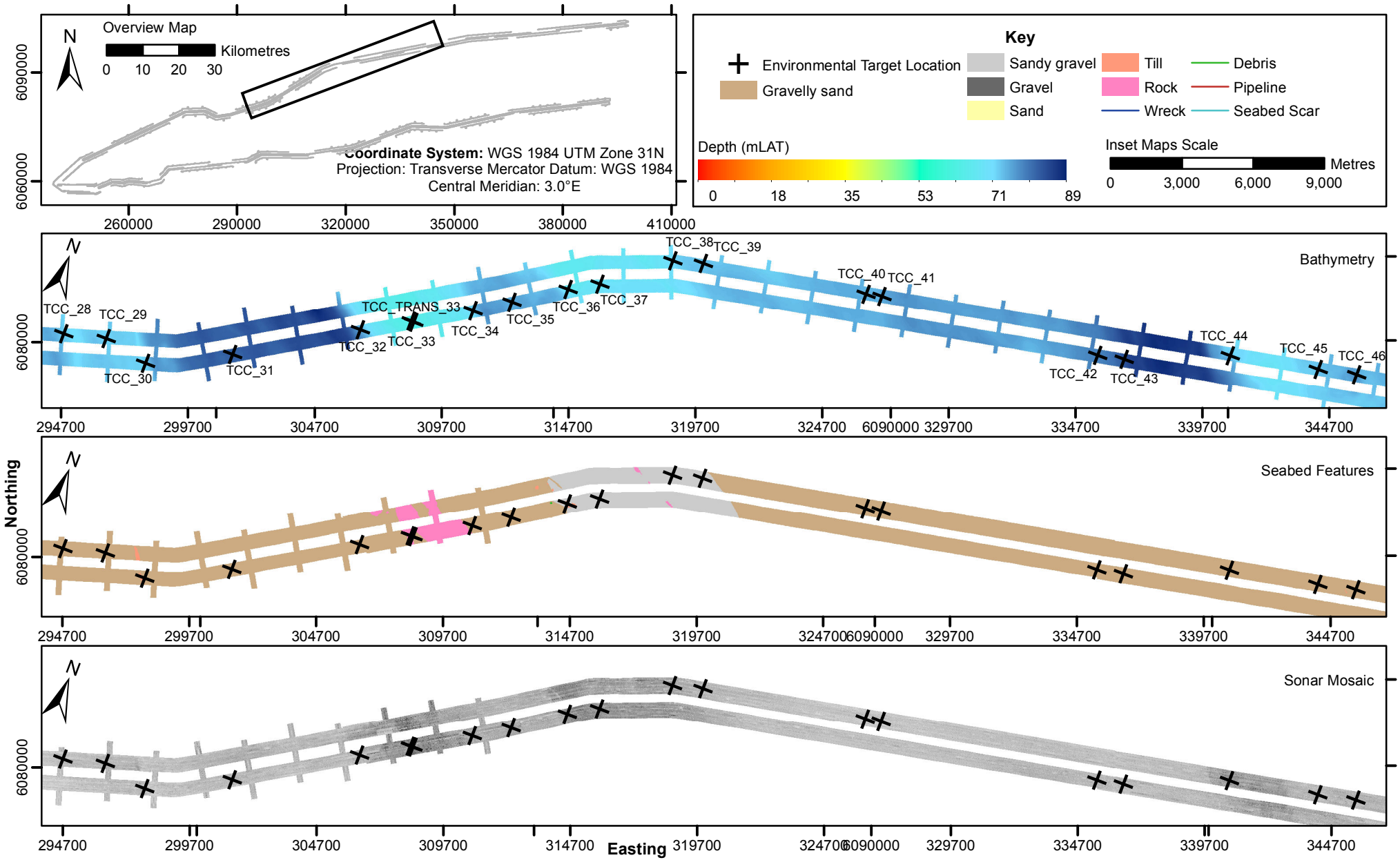


Figure 4.2c Bathymetry, Seabed Features and Sonar Mosaic - TCC Northern Route East

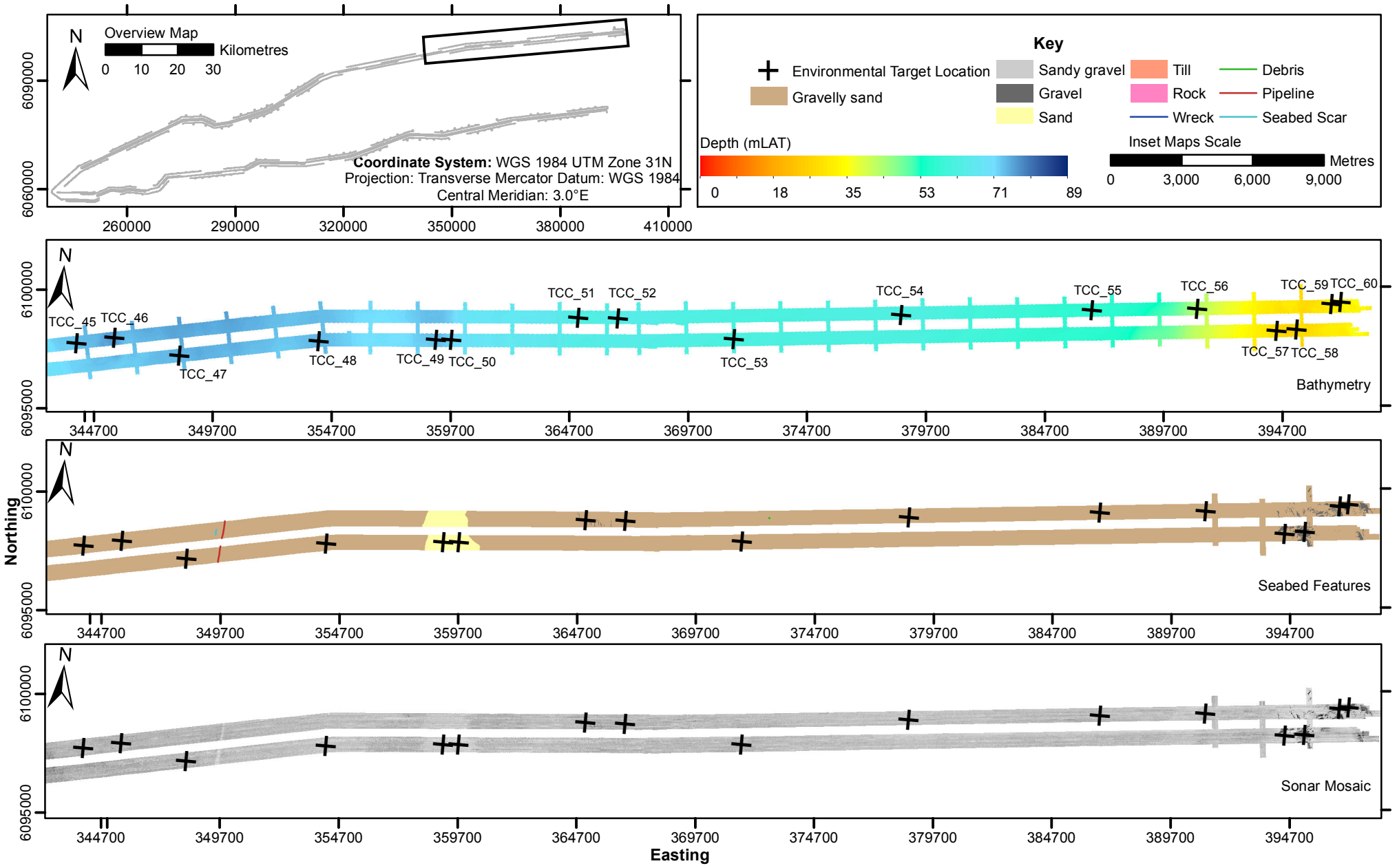


Figure 4.3a Bathymetry, Seabed Features and Sonar Mosaic - TCC Southern Route West

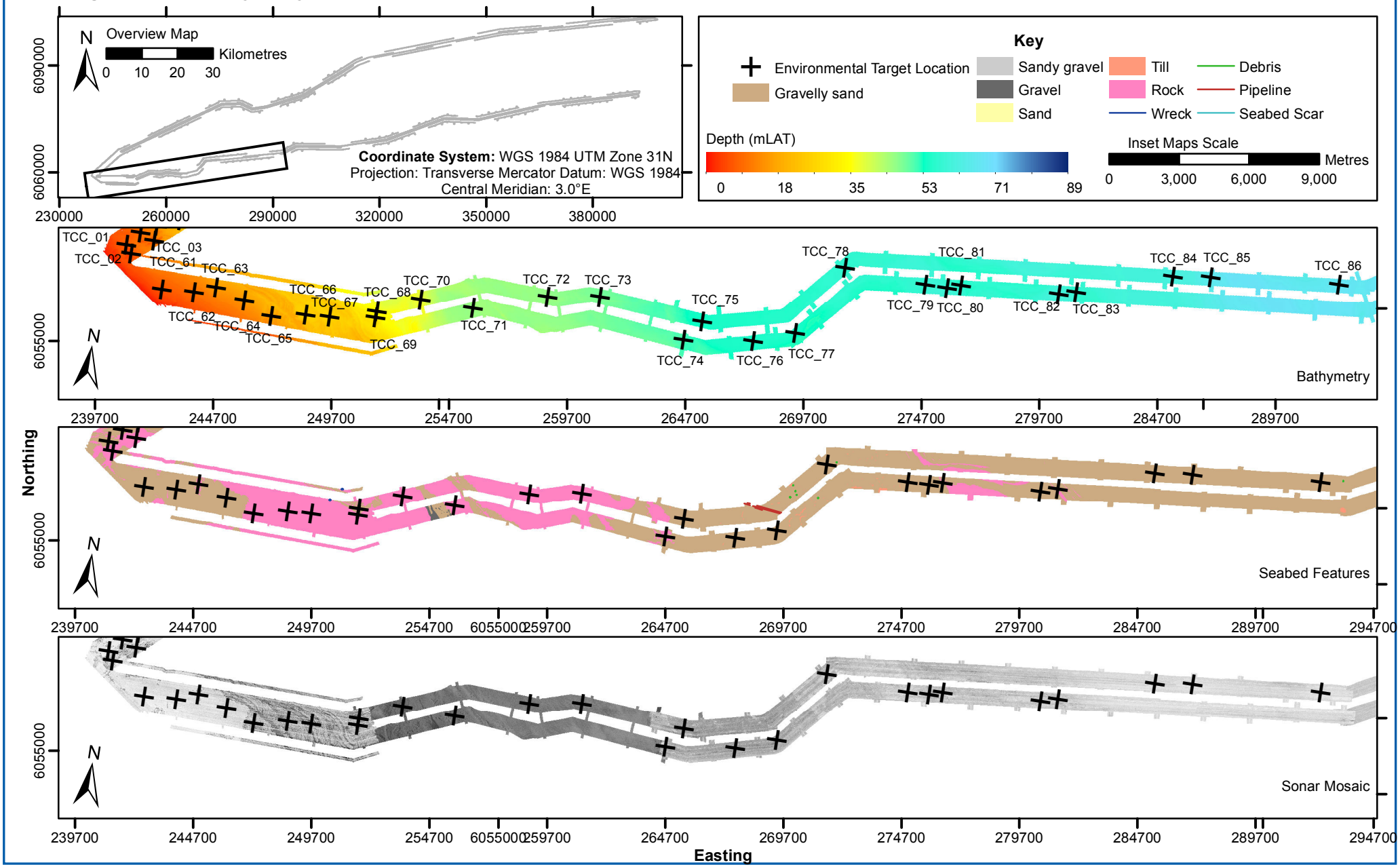


Figure 4.3b Bathymetry, Seabed Features and Sonar Mosaic - TCC Southern Route Centre

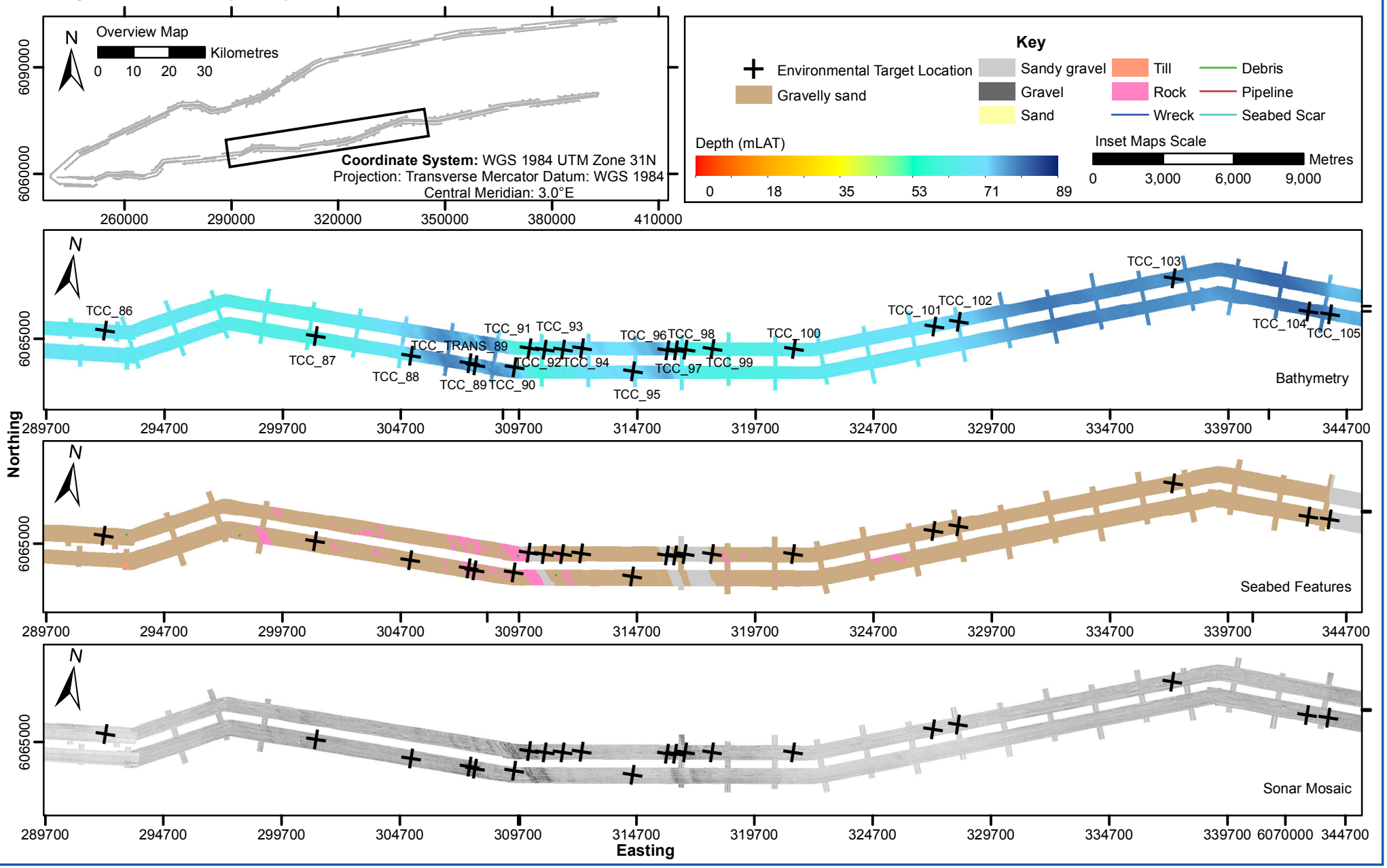
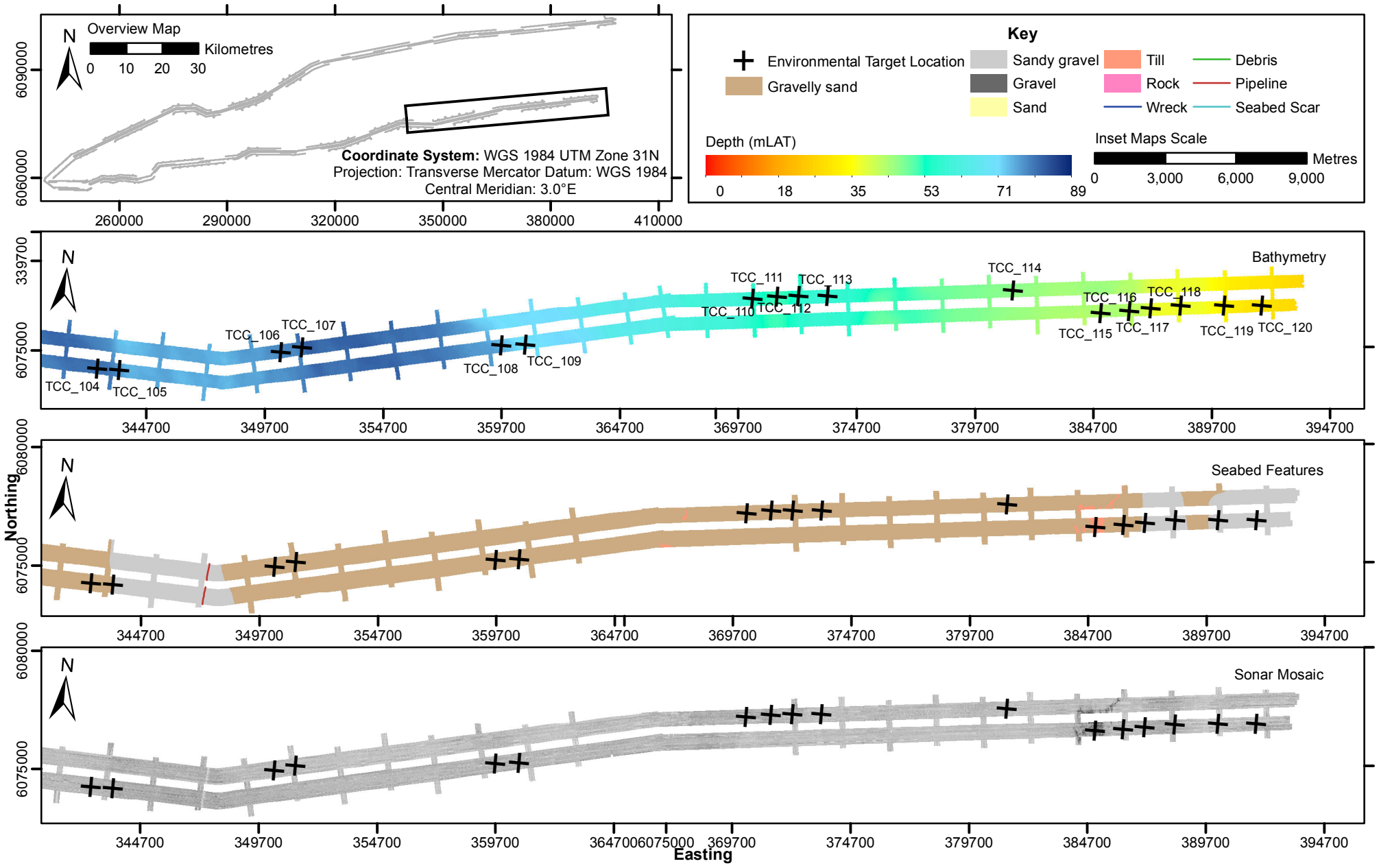


Figure 4.3c Bathymetry, Seabed Features and Sonar Mosaic - TCC Southern Route East



4.2 Seabed Imagery

Seabed photography and video footage supported the initial interpretation of the geophysical data, revealing a relatively uniform seabed across much of the surveyed routes, with large areas of low reflectivity displaying sand with shell fragments and occasional patches of gravel. These areas occurred across much of the offshore sections of both cable routes. Stations investigated in high reflectivity areas revealed rock, boulders, and coarse sediments comprising gravel, pebbles and cobbles, coinciding with areas delineated as outcropping bedrock, till or gravel on the seabed features figures (**Figures 4.2a** to **4.2c**; Northern Route and **Figures 4.3a** to **4.3c**; Southern Route). A selection of seabed images is given in **Appendix B**.

Visible faunal density and diversity were relatively low within the dominant sandy sediments and noticeably increased within areas of high reflectivity and corresponding coarse sediments, boulders and outcropping bedrock. Common fauna visible within the low reflectivity sandy sediments were seapens (*Pennatula phosphorea*, *Virgularia mirabilis*), foraminifera (largely *Astrorhiza* sp.) and mobile epifauna including echinoderms (*Astropecten irregularis*, *Asterias rubens*) and crustaceans. Polychaete tubes were also frequently observed in these homogenous sandy sediments.

In areas of increased seabed complexity, high densities of encrusting fauna were visible, including the tube-building polychaete *Spirobranchus* sp., soft coral (*Alcyonium* sp.), hydrozoans (including Sertulariidae, *Abientinaria* sp., *Tubularia* sp., *Hydrallmania* sp. and *Thuiria thuja*) and bryozoans (mainly Flustridae). At several of the shallower nearshore stations, kelp (*Laminiaria* sp.) was observed. Increased densities of mobile fauna such as crustaceans (Caridea, Majidae, *Munida* sp.), brittlestars (Ophiuroidea) and sea urchins (*Echinus esculentus*) were also observed.

4.2.1 'Stony Reef' Assessment

After initial interpretation of the geophysical data and seabed imagery, two additional transects were investigated for potential stony reef structures, one on the Northern route (TCC_TRAN_33) and one on the Southern route (TCC_TRAN_89). Reef assessment was based solely on the seabed imagery (digital stills and video footage) in line with the established Gardline protocol and guidelines on the assessment of stony reef published by Irving (2009) and Limpenny *et al.* (2010),, detailed in Section 2.13. Transects were selected in areas of interest identified in the geophysical data, the details for which are included in **Table 4.1**. Results of the stony reef assessment are presented in **Table 4.2**, summary sheets for each transect based on digital stills analysis are included in **Appendix F**.

It is important to note that values for composition, extent, elevation and biota have not been assessed as an average value across the entire transect. TCC_TRAN_33 measured approximately 225m^2 and TCC_TRAN_89 measured 304m^2, and footage and images were recorded across features of interest and surrounding featureless seabed. As such, both transects contain areas which are not 'stony reef' as well as areas which may be

medium or low resemblance to stony reef. Therefore, areas of low and medium resemblance to stony reef have been discussed in relation to patches greater than 25m^2, as averaging transect values would have masked potential areas of reef. The overall estimate of resemblance can therefore be considered the likely maximum resemblance for the area surveyed with the camera system.

Analysis of the video footage and digital stills revealed a seabed mostly comprised of sand, with patchy deposits of pebbles, cobbles and boulders. There were some areas of low resemblance to 'stony reef' across TCC_TRAN_33 (areas >25m^2 with 10-40% cobbles and boulders and <0.064m elevation), and occasional smaller patches with medium resemblance but there was little evidence of the epifauna which a reef structure should promote. Therefore TCC_TRAN_33 has also been designated as low resemblance to stony reef. Flat seabed with <10% cobble and boulder material was recorded across the majority of TCC_TRAN_89, which is not indicative of a stony reef. A summary sheet for each transect based on digital stills analysis is included in **Appendix F**.

Table 4.1 Transect Target Information

Transect	Reason for transect selection	SOL		EOL	
		Target Easting	Target Northing	Target Easting	Target Northing
TCC_TRAN_33	Further investigation of high reflectivity at TCC_CAM_33	307434	6086089	307332	6086276
TCC_TRAN_89	Further investigation of high reflectivity at TCC_CAM_89	307572	6066412	307572	6066712

SOL: Start of line, EOL: End of line

Table 4.2 Stony Reef Assessment Results

Transect	Composition (% Cobbles/Boulders)	Elevation (m^2)	Extent (m^2)	Biota	Resemblance to 'Stony Reef'
TCC_TRANSECT_33	10-40%	<0.064m	>25m^2	Predominantly Infauna	Low resemblance
TCC_TRANSECT_89	<10%	Predominantly flat seabed	<25m^2	Infauna	Not a 'stony reef'

4.2.2 Other Features of Conservation Importance

In addition to the potential for stony reef habitat, stations were considered for resemblance to 'Sandbanks which are slightly covered by sea water all the time', as protected under Annex I the EC Habitats Directive 92/43/EEC and outlined in Section 3.2.2. Annex I sandbank habitats correspond with the priority habitat Subtidal Sands and Gravel in the UK Biodiversity Action Plan. Sublittoral sand and gravel habitats occur in a wide variety of environments, from sheltered (sea lochs, enclosed bays and estuaries) to highly exposed conditions (open coast) (UKBAP, 2011). The nearshore sections of both routes pass through an area of potential Annex I 'Sandbank' habitat (See Location Map, page viii; Johnston *et al*., 2002). Stations TCC_01, TCC_03, TCC_05 on the Northern route and

Stations TCC_61, TCC_62 and TCC_64 on the Southern route have been highlighted as potential Annex I sandbank habitats as all six stations occur in fine sandy sediments in shallow water.

Assessment of seabed footage and imagery alone did not reveal evidence of any other features of conservation importance on the OSPAR (2008) list of threatened and/or declining species and habitats.

4.3 Sediment Sampling Summary

A total of 76 mini-Hamon grab samples were retained from 128 attempts and 49 Day grab samples from 69 attempts. The majority of failed sampling attempts were due to low retention or due to coarse material getting caught in the jaws of the grab, allowing sediment washout. These failed attempts have been taken into consideration when interpreting the results, as the retained sample may be a finer representation of the sediment type at that station. Due to repeated failed sampling attempts as a result of the coarse nature of the seabed, mini-Hamon grab sampling could not be completed at three stations (TCC_66, TCC_68 and TCC_74) and Day grab sampling could not be completed at TCC_14, TCC_66 and TCC_68. At five stations where mini-Hamon grab samples were below the acceptance criteria volume of 5L, macrofauna and PSA samples were taken from separate grab samples.

All retained samples were taken from within 50m of the target location, with the exception of Station TCC_75 which was taken 108m from its target. Exact positions of the sampling attempts are presented in the surveyor's logs in **Appendix A** and a selection of photographs of the grab samples can be found in **Appendix B**.

4.4 Sediment Characteristics

4.4.1 Sampling Observations

Observations of the sediment were made by the field environmental scientists at the time of sampling and are presented in the environmentalist's deck logs in **Appendix A**. Deck observations were consistent with interpretation from the acoustic data and with evidence from seabed imagery, with sediments generally being described as fine to medium sand with varying quantities of shell fragments and occasional gravel. Coarser, mixed sediments were observed at Stations TCC_12, TCC_14, TCC_53, TCC_75, TCC_76 and TCC_115, consisting of gravel, pebbles and cobbles.

Possible anoxic odours were observed from just one sediment sample at Station TCC_114. **Table 4.3** summarises the sediment colour and code classified according to the Munsell colour chart for each of the TCC offshore grab stations. Munsell colours were not recorded during the nearshore section of the TCC survey (Stations TCC_01 to TCC_14 and TCC_61 to TCC_77). A selection of photographs of the grab samples can be found in **Appendix B**.

Table 4.3 Munsell Colour Summary (TCC Offshore only)

Munsell Code	Description	Number of stations (n=57)
2.5Y 2.5/1	Black	7
2.5Y 3/1	Very dark grey	7
2.5Y 3/2	Very dark greyish brown	5
2.5Y 3/3	Dark olive brown	2
2.5Y 4/2	Dark greyish brown	1
2.5Y 4/3	Olive brown	2
2.5Y 4/4	Olive brown	1
5Y 2.5/1	Black	2
5Y 2.5/2	Black	3
5Y 3/1	Very dark grey	2
5Y 3/2	Dark olive grey	14
5Y 4/1	Dark grey	1
5Y 4/2	Olive grey	4
5Y 4/3	Olive	5
10YR 3/1	Very dark grey	1

4.4.2 Particle Size Analysis

The full results of the sediment particle size analyses, determined using a Malvern Mastersizer, in addition to wet and dry sieving, including histograms illustrating the particle size distributions at each station, are presented in **Appendix C**.

Sediments from grab samples across both Northern and Southern TCC routes were found to be broadly uniform, with 75% of stations described as fine sand under the Wentworth classification system. The majority of sediments at these stations were also described as moderately sorted to very well sorted. The Wentworth system is based on mean particle size and is thus less reliable for poorly sorted sediments, for which the Modified Folk classification system is more useful. **Table 4.4** summarises the Modified Folk results.

Eighty-three percent of all stations were heavily dominated (≥80%) by sand sized particles with relatively low fines (<63µm) and gravel content (>2mm). Fine material dominated at the nearshore Station TCC_09 (62% fines), resulting in a Modified Folk classification of slightly gravelly sandy mud. High fines were also found at Stations TCC_06, TCC_10, and TCC_71 with fines contents of 21.2%, 35.3% and 20.7%, respectively. These stations were classified as slightly gravelly muddy sand (TCC_06, TCC_10) and gravelly muddy sand (TCC_71). Fines at all other stations ranged from 0.8% to 13.1%. Gravel dominated the sediments at Stations TCC_76 (61.5%) in the west and TCC_115 (64.8%) in the east section of the southern route, resulting in Modified Folk classifications of muddy sandy gravel and sandy gravel, respectively. High gravel content was also found at Stations TCC_12, TCC_14, TCC_16 in the west section of the northern route, TCC_53, east section of northern route and TCC_75, west section of the southern route with 23.1%, 24.5%, 25.8%, 43.1% and 31.8% gravel, respectively. These stations with high proportions of poorly sorted gravelly sediments were consistent with areas of gravelly sand or gravelly sand with outcropping rock or till delineated on the seabed features (**Figures 4.2** and **Figures 4.3**). **Figure 4.4** illustrates the distribution of the principal sediment components along the TCC routes.

Multivariate statistical analyses were performed on the PSA data using PRIMER v6 (Plymouth Marine Laboratories) in order to display the relationship between stations based on sediment characteristics. Mean particle size (phi) was removed from the analyses due to its intrinsic relationship with mean particle size (µm) and all variables were log transformed due to skewed distributions. The data were then normalised and subjected to Euclidean distance similarity dendrogram and MDS interpretation.

The MDS plot (**Figure 4.5a**) provides an illustration of the similarity between samples based on sediment composition, overlain with the Modified Folk classifications for each station. The majority of stations, which were classed as slightly gravelly sand were tightly grouped in the bottom right hand corner of the plot. Investigation of the raw data, in conjunction with a SIMPER analysis indicated that the distribution of groupings and outliers was generally based on differences in the composition of the proportion of gravel and fines. **Figures 4.5b** and **4.5c** show the MDS ordination overlain with percentage gravel and percentage fines, respectively. As expected, Stations TCC_06, TCC_09, TCC_10, and TCC_71 were separated based on a higher proportion of fines and Stations TCC_12, TCC_14, TCC_16, TCC_53, TCC_75, TCC_76 and TCC_115 were separated based on higher proportions of gravel.

4.4.3 Organic Carbon

Total organic carbon (TOC) results are presented in **Appendix C**. TOC content of the sediment ranged from <0.4% at Station TCC_114 on the offshore Southern route to 4.60% at Station TCC_10 on the nearshore Northern route. Stations with the highest TOC content (Station TCC_10 and Station TCC_09 with 3.45%) also recorded the highest observed proportions of fine sediment (62% at Station TCC_09 and 35.3% at Station TCC_10). This observed pattern suggests that variation in TOC may be due to natural variation of the physical properties of the sediment.

Table 4.4 TCC Modified Folk Classification Summary

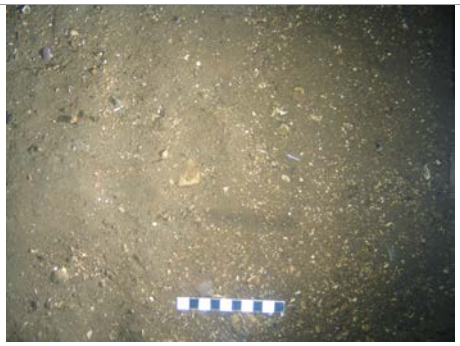
Modified Folk Classification	Number of stations (n=71)	Representative Seabed Image
Slightly gravelly sand **(g)S**	51	 TCC_CAM_49 (Fix 1002)
Gravelly sand **gS**	9	 TCC_CAM_18 (Fix 66)
Slightly gravelly muddy sand **(g)mS**	3	 TCC_CAM_46 (Fix 953)
Gravelly muddy sand **gmS**	3	 TCC_CAM_71 (Fix 253)

Table 4.4 TCC Modified Folk Classification Summary Continued

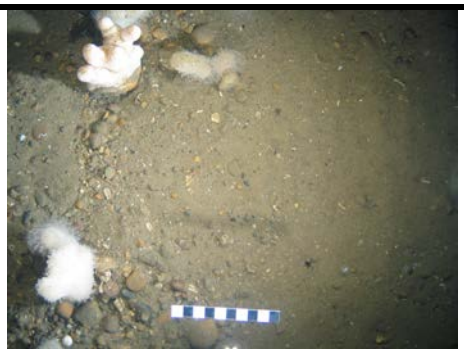
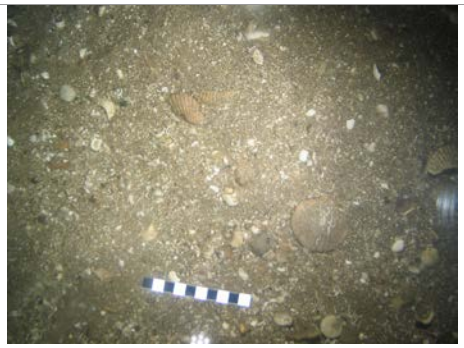
Modified Folk Classification	Number of stations (n=71)	Representative Seabed Image
Sandy gravel **sG**	2	 TCC_CAM_ 115 (Fix 844)
Muddy sandy gravel **msG**	2	 TCC_CAM_ 75 (Fix 386)
Slightly gravelly sandy mud **(g)sM**	1	 TCC_CAM_09 (Fix 112)

Figure 4.4 Distribution of Principal Sediment Components within TCC

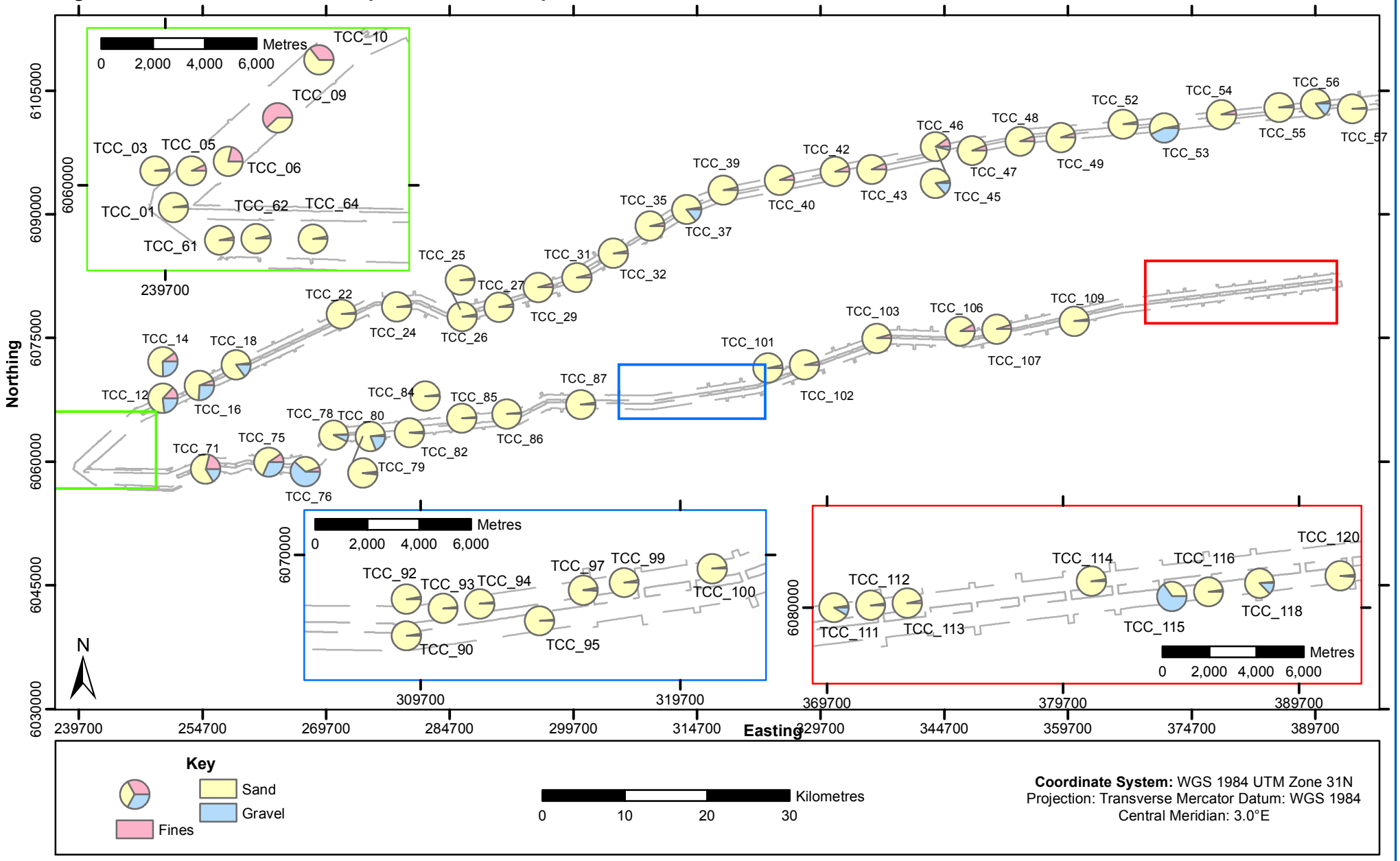
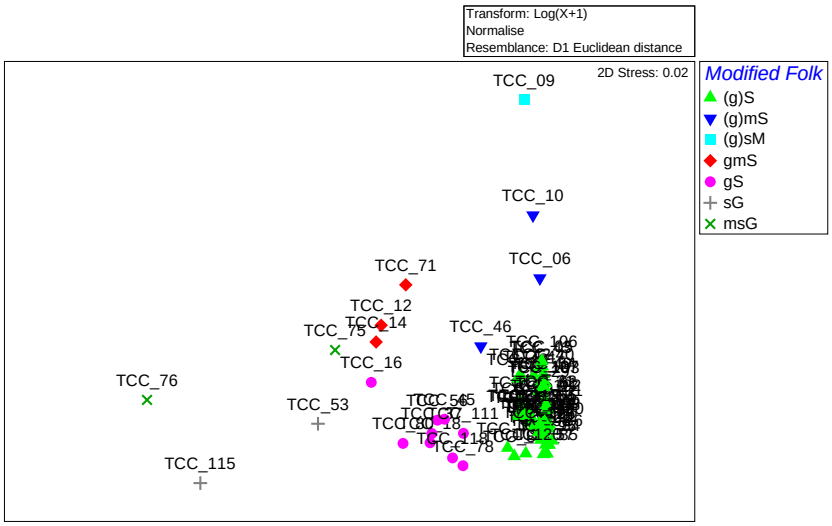
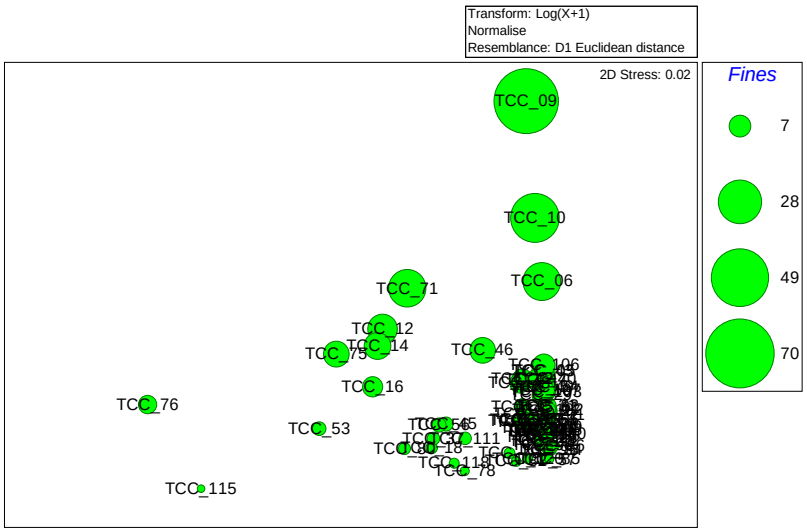


Figure 4.5 PSA MDS Ordination Bubble Plot

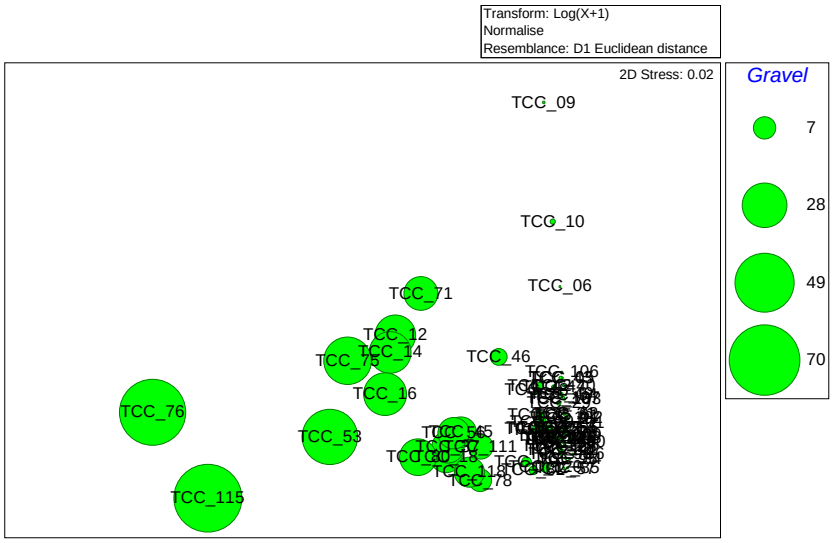
a) Modified Folk Classification



b) Fines (<63µm)



b) Gravel (>2mm)



4.5 Contaminants

4.5.1 Hydrocarbon Concentrations

A summary of the results of the hydrocarbon analyses is presented in **Table 4.5**. Hydrocarbon concentrations at all 21 sampled stations are presented in full in **Appendix D**. Where available, hydrocarbon concentrations have been compared to the ERL and ERM levels published by Long *et al*. (1995) as well as the Canadian Environmental Quality Guidelines for the Protection of Aquatic Life (Interim Sediment Quality Guidelines; ISQG) and Probable Effect Level (PEL; CCME, 1999).

Total hydrocarbon concentrations (THC) varied between 4.03mg kg^{-1} at Station TCC_CHEM_114 in the east section of the Southern route and 1590mg kg^{-1} at Station TCC_CHEM_10 in the west nearshore section of the northern route. THC concentrations were ≤50.3µg g^{-1} with the exception of Stations TCC_CHEM_6, TCC_CHEM_9, TCC_CHEM_10 and TCC_CHEM_12. These four stations were situated in the nearshore section of the Northern Route.

Total PAH concentrations varied between <0.100mg kg^{-1} at Station TCC_CHEM_114 and 14.6mg kg^{-1} at Station TCC_CHEM_10. Stations TCC_CHEM_09 and TCC_CHEM_10, which recorded the highest THCs and total PAH concentrations across the survey area, also presented 11 individual PAH concentrations above the ERL levels but below ERM levels (Long *et al*., 1995) . Stations TCC_CHEM_06 and TCC_CHEM_12 presented concentrations above the ERL levels for four and three of the 12 available PAHs, respectively. Stations TCC_CHEM_09 and TCC_CHEM_10 also presented concentrations of several individual PAHs above the Probable Effect Levels (CCME, 1999).

Stations TCC_CHEM_09 and TCC_CHEM_10, together with Stations TCC_CHEM_06 and TCC_CHEM_12 presented some of the highest concentrations of sediment fines (13.1 to 62.0%). These proportions of fine material support the evidence that in part, the hydrocarbon concentrations at these stations may be due to natural variation of the physical characteristics of the sediment. As evidenced by the individual PAH results, it is possible that the source of elevated hydrocarbons at stations sampled in the nearshore section of the Northern Route were from urban runoff and rivers; generally, the highest PAH concentrations are found in coastal sediments. Further, chronic petrogenic contamination associated with maritime activity may also be contributor to the elevated THCs. Without further analysis of the aliphatic hydrocarbons, it is difficult to determine the exact source of these elevated hydrocarbons and the extent of weathering.

Table 4.5 Summary of Hydrocarbon Concentrations and Quality Criteria

Analyte	Min	Max	Number of stations above:			
			Interim Sediment Quality Guidelines (ISQG)[1]	Probable Effect Levels (PEL)[2]	Effect Range Low (ERL)[3]	Effect Range Median (ERM)[3]
Benzo(b)anthracene	<10	57.1				
Benzo(e)pyrene	<10	963				
Benzo(j)fluoranthene	<10	504				
C1 Chrysene	<10	1140				
C1 Dibenzothiophene	<10	565				
C1 Fluoranthene	<10	2270				
C1 Fluorene	<10	1020				
C1 Naphthalene	<10	4060				
C1 Phenanthrene	<10	3020				
C2 Chrysene	<10	398				
C2 Dibenzothiophene	<10	439				
C2 Fluorene	<10	1510				
C2 Naphthalene	<10	4400				
C2 Phenanthrene	<10	2910				
C3 Chrysene	<10	514				
C3 Dibenzothiophene	<10	503				
C3 Fluorene	<10	1420				
C3 Naphthalene	<10	4550				
C3 Phenanthrene	<10	2160				
C4 Chrysene	<10	119				
C4 Naphthalene	<10	2540				
C4 Phenanthrene	<10	1640				
Dibenzothiophene	<10	200				
Perylene	<10	289				
Acenaphthene	<2	317	6	2	4	
Acenaphthylene	<2	453	5	2	2	
Anthracene	<2	748	3	2	2	
Benzo(a)anthracene	2.64	1230			2	
Benzo(a)pyrene	<2	1150	2	1	2	
Benzo(b)fluoranthene	<10	569				
Benzo(ghi)perylene	<10	673				
Benzo(k)fluoranthene	<10	503				
Chrysene + Triphenylene	<3	1280				
Dibenzo(ah)anthracene	<5	172	4	1	2	
Fluoranthene	2.8	2210	4	1	2	
Fluorene	<10	502	4	2	4	
Indeno(1,2,3-c,d)pyrene	<10	512				
Naphthalene	<30	2050	15	3	4	
Phenanthrene	<10	2600	4	2	3	
Pyrene	3.16	1900	3	1	2	
Total PAH (mg/kg)	<0.100	14.6				
Total Hydrocarbons (mg/kg)	4.03	1590				

Unless specified, all concentrations expressed in µg kg^{-1}

Number of stations indicated in red recorded above respective Quality Criteria and all (or remaining) stations below criteria highlighted in green

1 Interim Sediment Quality Guidelines (ISQG; CCME, 1999)

2 Probable Effects Limit (PEL; CCME (1999))

3 ERL (Effects Range Low) and ERM (Effects Range Medium (ERM); Long *et al.*, 1995)

4.5.2 *Metal and Metalloid Concentrations*

A summary of the results of the metals analyses is presented in **Table 4.6**. Metals concentrations at all 21 sampled stations are presented in **Appendix D**. Where available, hydrocarbon concentrations have been compared to the CEFAS (2003) Action Levels (AL) for dredged material, the ERLs and ERMs (Long *et al*., 1995), the Canadian ISQGs and PELs (CCME, 1999), and the Apparent Effects Threshold (AET; Buchman, 2008).

Cd was the only metal quantified to present concentrations below all existing thresholds at all stations. Cr presented concentrations above all but the AL2 threshold; notably all stations were above the AL1, ISQG and AET, 20 stations were above the ERL, 14 above the PEL and two above the ERM. As presented concentrations above the AL1, ISQG and ERL; notably, at 19 of the 21 stations concentrations were above the Canadian ISQG and the ERL. Cu and Pb also presented concentrations above the AL1, ISQG and ERL, as well as their respective PEL (CCME, 1999); notably Cu presented concentrations above its AL1, ISQG and ERL at all stations and above its PEL at six stations. Ni was found to have concentrations above all existing background thresholds with notably all concentrations above the AL1 and the ERL, 18 stations presenting concentrations above the ERM, nine above the AET and two above the AL2. Concentrations of Zn were above the AL1 and ISQG at two stations and above the ERL at one station, while concentrations of Hg were above the ISQG and ERL at one station.

The AET was the only background information available for concentrations of Mn, Sn, V and Se. These metals revealed, 21, six and 13 stations, respectively, with concentrations above their respective AETs. Se showed all concentrations below the AET.

The highest concentration of 11 of the 17 quantified metals (Al, As, Cd, Hg, Pb, Li, Sn, V, Zn and B) were all observed at Station TCC_CHEM_10 while the highest concentration of Cu and Ni were observed at Station TCC_CHEM_12. As with the hydrocarbon concentrations, it is likely the high proportions of fine sediments at these two stations act as a sink for these metals compounds, as a result of the relatively large surface area these fine particles possess. The source of metals is most likely anthropogenic associated with urban runoff and/or maritime activity.

4.5.3 *Polychlorinated biphenyls (PCBs)*

The results of the analyses for seven chlorinated biphenyl congeners are provided in **Appendix D**. PCB concentrations were below the limit of detection at 19 of the 21 sampled stations. Station TCC_CHEM_09 showed PCB concentrations between the limit of detection and 0.36µg kg^{-1} and Station TCC_CHEM_10 presented concentrations between the limit of detection and 1.16µg kg^{-1}. The sum of these seven quantified PCBs were 1.2µg kg^{-1} at Station TCC_CHEM_09 and 5.0µg kg^{-1} at Station TCC_CHEM_10, and were below the AL1 (CEFAS, 2003) of 10µg kg^{-1}.

Background sediment concentrations for individual congeners are normally <0.002µg g^{-1} (<2µg kg^{-1}) in the North Sea (Baeyens *et al*., 2000), the results therefore suggest that PCB concentrations at the sampled stations were representative of the wider area.

4.5.4 *Organotins*

Organotin concentrations are presented in full in **Appendix D**. Tributyltin (TBT) has received the most attention since being shown to be an endocrine disruptor. The use of TBT in anti-fouling paints resulted in widespread contamination of the marine environment, particularly in harbour areas.

Baeyens et al., (2000) indicate that concentrations of TBT in the sediment of UK waters range from <0.002µg g-1 offshore to 10µg g-1 in harbours. The concentration of TBT in the sediments collected during this survey were below the limit of detection at all sampled stations (<4µg kg-1 = 0.004ng g-1), and were considered to be representative of the wider area of the North Sea.

Table 4.6 Summary of Metals Concentrations and Quality Criteria

Metal (mg kg^{-1})	Minimum	Maximum	Number of stations above:						
			Action Level 1	Action Level 2	Interim Sediment Quality Guidelines (ISQG)	Probable Effect Levels (PEL)	Effect Range Low (ERL)	Effect Range Median (ERM)	Apparent Effect Threshold (AET)
Aluminium	11800	67100							
Barium	240	1980							
Iron	10700	44000							
Arsenic	6.74	28.3	6		19		19		
Cadmium	0.053	0.213							
Chromium	66	387	21		21	13	20	2	21
Copper	43.7	203	21		21	6	21		
Lead	14.9	138	11		17	1	12		
Lithium	9.57	76.1							
Manganese	299	887							21
Mercury	<0.002	0.267			1		1		
Nickel	41.4	222	21	2			21	18	9
Tin	0.67	5.42							6
Vanadium	25.6	108							13
Zinc	31	169	2		2		1		
Boron	3.19	19.2							
Selenium	<0.1	0.665							

All concentrations expressed in mg kg$^{-1(or}$

Number of stations indicated in red recorded above respective Quality Criteria and all (or remaining) stations below highlighted in green

1 AL (Action Level; CEFAS, 2003)
2 ERL (Effects Range Low) and ERM (Effects Range Medium (ERM); Long *et al.*, 1995)
3 Interim Sediment Quality Guidelines (ISQG; CCME, 1999)
4 Probable Effects Limit (PEL; CCME (1999))
5 Apparent Effects Threshold (AET; Buchman, (2008))

4.5.5 *Contaminants Summary*

Hydrocarbons and metals concentrations displayed considerable variation along the TCC routes. Highest total hydrocarbons, total PAH and individual PAHs were recorded at stations closer to shore, in particular at Stations TCC_CHEM_06, TCC_CHEM_09 and TCC_CHEM_10, while lower concentrations were generally seen at stations further offshore. Several inshore stations were also above comparison threshold concentrations.

A similar trend was observed for metal concentrations, with higher levels seen at inshore stations. However, several metals recorded relatively high concentrations across the survey routes including Cr (above AL1 and ISQG at 21 stations, ERL at 20 stations and above PEL at 13 stations,) Cu (above AL, ISQG and ERL at 21 stations) and Ni (above ERM at 18 stations).

Without further analyses, it is difficult to accurately determine the source of these contaminants; however it is possible that high concentrations found in nearshore sediments may be related to land-based run off or contamination from maritime traffic. In addition, organic carbon and fine sediments act as a sink for many persistent compounds, as a result of fine particles possessing a relatively large surface area. Within the TCC route survey, highest hydrocarbon and metal concentrations were generally found at stations with high levels of fine materials, suggesting that natural variation in sediment characteristics may be responsible in part for the higher than expected levels of contaminants seen.

4.6 Macrofaunal Interpretation

4.6.1 Overview

As in the sampling survey for Tranche B, one faunal sample was collected using a 0.1m^2 mini-Hamon grab at each pre-selected grab station (with the exception of Stations TCC_66, TCC_68 and TCC_74 where grab sampling was not successful due to the coarse nature of the seabed) and all samples were screened through a 1mm sieve. Faunal analysis and rationalisation was carried out as per our stated methods (Section 2.11) and as outlined in Section 3.7.

4.6.2 Summary and Univariate Statistics

In total, 6,745 individuals from 329 taxa were recorded from 71 samples. Juveniles accounted for 916 individuals from 38 taxa, making up 14% of the total individuals and 12% of the total taxa. In order to test whether juveniles had a significant effect on the structure of the data set, a RELATE analysis was conducted in PRIMER v6 (see Section 3.7.2). Although two juvenile taxa (Echinoidea juv. and Ophiuroidea juv.) appear among the top ten most dominant organisms in the data set, results from the RELATE analysis showed that the full data set was 98% similar to the same data set with the juveniles removed. This result indicated that juveniles may not be exerting an influence on the overall community structure and the following analyses were performed using the full data set, which is inclusive of juvenile counts.

The oceanic quahog, *Arctica islandica* was found at eight stations, with a total of ten individuals recorded across the survey routes.

The initial stage of analysis was the division of the data set into five gross taxonomic groups; Annelida (Polychaeta), Arthropoda (Crustacea), Mollusca, Echinodermata and ‘other taxa’. The other taxa group included Foraminifera, Cnidaria (anemones and sea pens), Platyhelminthes (flat worms), Nemertea (ribbon worms), Sipuncula (peanut worms),

Pycnogonida (sea spiders), Phoronida (horseshoe worms) and Hemichordata (acorn worms). The absolute and proportional contributions of these five taxonomic groups to the overall community structure are given in **Table 4.7** and displayed for each station in **Appendix E**.

Table 4.7 Contributions of the Gross Taxonomic Groups

Group	Individuals		Taxa	
	Abundance	Proportional Contribution (%)	Abundance	Proportional Contribution (%)
Annelida (Polychaeta)	3539	52	140	43
Arthropoda (Crustacea)	481	7	83	25
Mollusca	1036	15	66	20
Echinodermata	1191	18	22	7
Other	498	7	18	5
Total	**6745**	**100**	**329**	**100**

Overall, the macrofaunal community was dominated by polychaete annelids, contributing 52% of the total individuals and 43% of the total taxa. Studies by Gage (2001) show polychaetes consistently dominating soft bottom benthos from continental shelves to abyssal plains and revealed that over 50% of total macrofaunal individuals are generally composed of polychaete worms. Echinoderms were the next most dominant taxonomic group in terms of individual abundance, accounting for 18% of total individuals with just 7% of the total taxa. This dominance was caused largely by high abundances of Ophiuroidea and Echinoidea juveniles. The next most abundant taxonomic group in terms of total individuals was Mollusca with 15% of all individuals. The second most dominant group in terms of taxa abundance was Arthropoda, which contributed 25% of all taxa. Contributions of the gross taxonomic groups at each station are presented in **Appendix E**.

Highest macrofaunal density was recorded at Station TCC_56 with 312 individuals. The faunal community at this station was dominated by polychaetes, contributing 75% of individuals and 42% of taxa. Station TCC_75 had the second highest faunal density with 221 individuals. Again, polychaetes dominated at this station, contributing 65% of the individuals and 49% of the taxa. Lowest macrofaunal densities were recorded at Stations TCC_25 and TCC_27 along the Northern route with 26 and 24 individuals, respectively. Faunal distributions of the number of individuals and taxa throughout the survey area are presented in **Figure 4.6**.

The top ten most abundant taxa are presented in **Table 4.8**. The most abundant species, with 581 individuals identified at 50 stations, was the polychaete *S. bombyx*. *S. bombyx* is commonly found in sublittoral sands and sandy muds (Rees *et al*., 2007) and is known to be tolerant to both smothering and substratum loss and to be intolerant to changes in nutrients (Hiscock *et al.,* 2005). *S. bombyx* was observed to be the most frequently distributed species in the entire North Sea in a pooled data set of the North Sea Benthos Survey and the Ministry of Agriculture, Fisheries and Food cruises (Heip and Craeymeersch, 1995). The second most abundant taxon, the polychaete *Galathowenia oculata,* is commonly found in mixed sublittoral sediments, muddy sands, or sandy muds

(Hiscock *et al*., 2005). The species is known to be intolerant of hydrocarbon contamination (Olsgard and Gray 1995) but populations have been known to increase in organically enriched areas and areas of dredged sediment disposal (Angonesi *et al*., 2006). The third most abundant taxon was juveniles from the class Ophiuroidea (brittle stars). Brittle stars are found in a wide range of marine habitats ranging from stony muddy shores to muddy sediments in deeper water. The large number of juveniles found in the current survey may be indicative of a recent recruitment event. Most echinoderms are typically sensitive to environmental pollutants, and Ophiuroidea are known to be highly intolerant to, or suffer a reduction in abundance, as a result of hydrocarbon contamination of sediments (Hiscock *et al*., 2004).

Table 4.8 Top Ten Most Abundant Taxa

Rank by Abundance	Species/Taxon	Number of Stations (%)	Total Abundance
1	*Spiophanes bombyx*	70	581
2	*Galathowenia oculata*	49	409
3	Ophiuroidea juv.	86	401
4	*Paramphinome jeffreysii*	63	341
5	Echinoidea juv.	58	234
6	*Amphiura filiformis*	58	207
7	*Scoloplos (Scoloplos) armiger*	56	164
8	*Echinocyamus pusillus*	38	162
9	*Astrorhiza*	37	147
10	*Phoronis*	59	145

In contrast to the characterising taxa of the survey area, 124 of the 329 taxa (38% of the total taxa) were recorded at a single station and 103 taxa (31% of the total taxa) were represented by a single individual. This may be useful as a future indicator of physical disturbance, as under these scenarios it is expected that these taxa would be altered, most likely decreasing to be replaced with high abundances of a limited suite of tolerant species.

Biomass analysis results are presented in detail in **Appendix E** and the distribution of total biomass is presented in **Figure 4.7**. Total biomass was relatively consistent across the survey area, with the majority of stations recording ≤1.5g AFDW. Highest biomass was found at Station TCC_115 in the east section of the Southern route, with a total of 5.32g AFDW biomass recorded, just over 89% of which was contributed by 'miscellaneous' taxa. Review of the raw unrationalised macrofaunal data in conjunction with deck photographs revealed a large sample of soft coral, *A. digitatum* at this station.

The data set was further analysed to provide the total number of individuals, the total number of taxa, the Shannon-Wiener diversity index (*H'*) calculated using a logarithm base 2 (Shannon and Weaver, 1949), Simpson's dominance (*λ*) and Pielou's evenness (*J*) for each station. Increasing values for the Shannon-Wiener diversity index correspond to increasing diversity and richness of the community. Values for Simpson's dominance index and Pielou's evenness both range from 0 to 1, with a value of 1 indicating a dominant community for the former and an even community for the latter. The results of further univariate analyses are presented in **Appendix E** and **Figures 4.8** and **4.9**.

The univariate statistics suggest a generally diverse, but variable faunal community across the TCC survey routes. Highest diversity was observed at Stations TCC_14 (*H'*=5.10) and at Station TCC_47 (*H'*=5.04) on the Northern Route. Lowest diversity was observed at Station TCC_01 (*H'*=2.12). In general, lower diversity values were found close to shore on both routes. Pielou's evenness values ranged from 0.63 at Station TCC_56 to 0.95 at Station TCC_100, suggesting a relatively even spread of fauna across the majority of both survey routes. Simpson's λ values ranged from 0.05 at Station TCC_80 to 0.39 at Station TCC_01, indicating variation in dominance structures. As expected, stations with high dominance values generally recorded lower diversity and evenness values.

Figure 4.6 Individual and Taxa Abundance - TCC

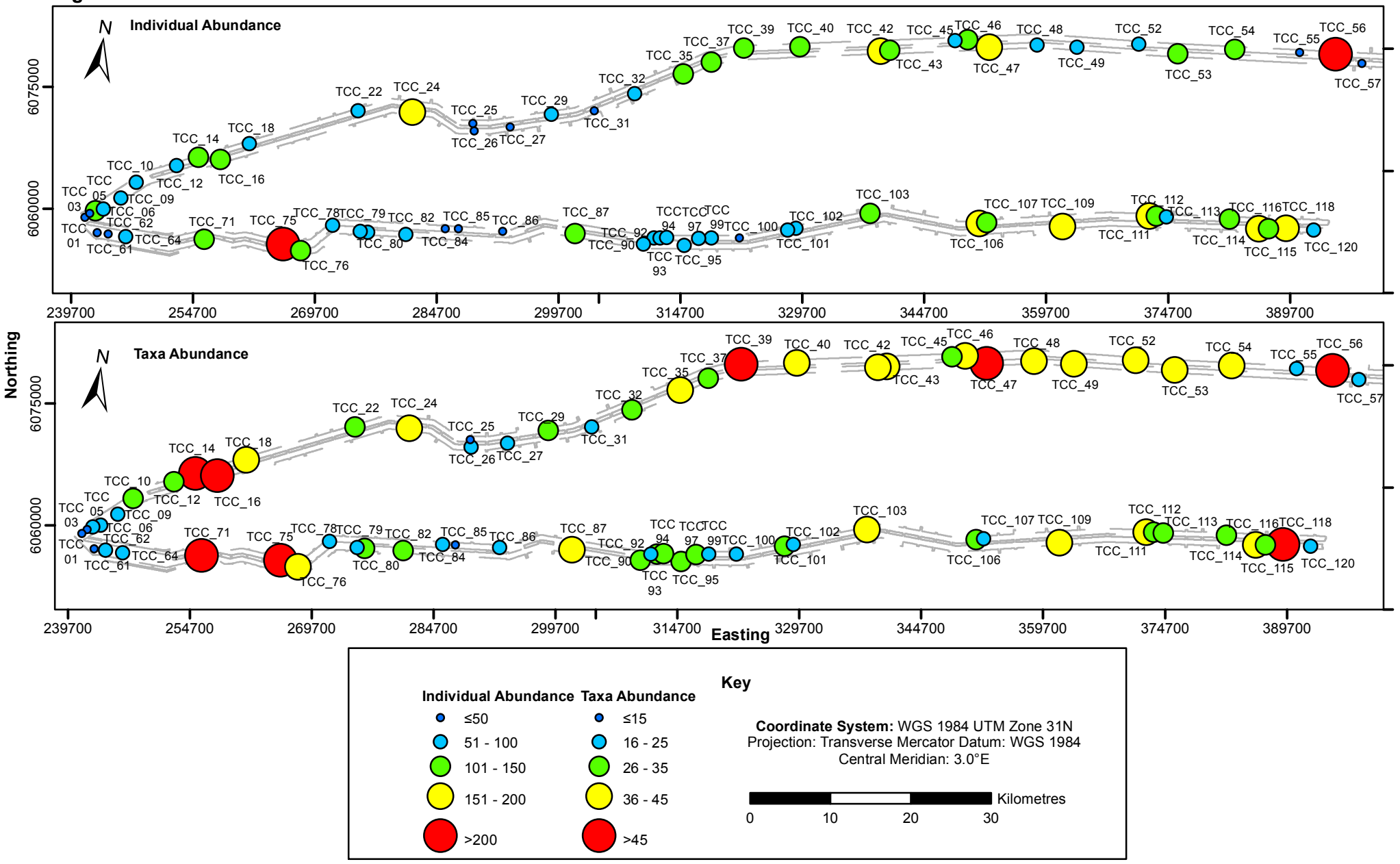


Figure 4.7 Macrofaunal Biomass - TCC

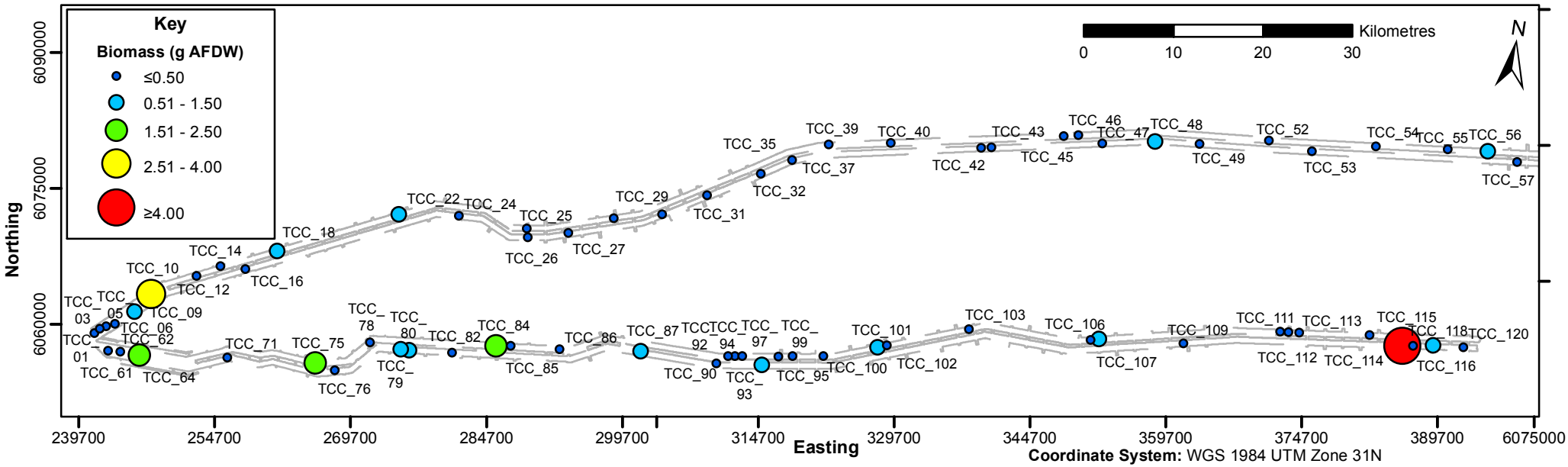


Figure 4.8 Shannon-Wiener Diversity Index - TCC

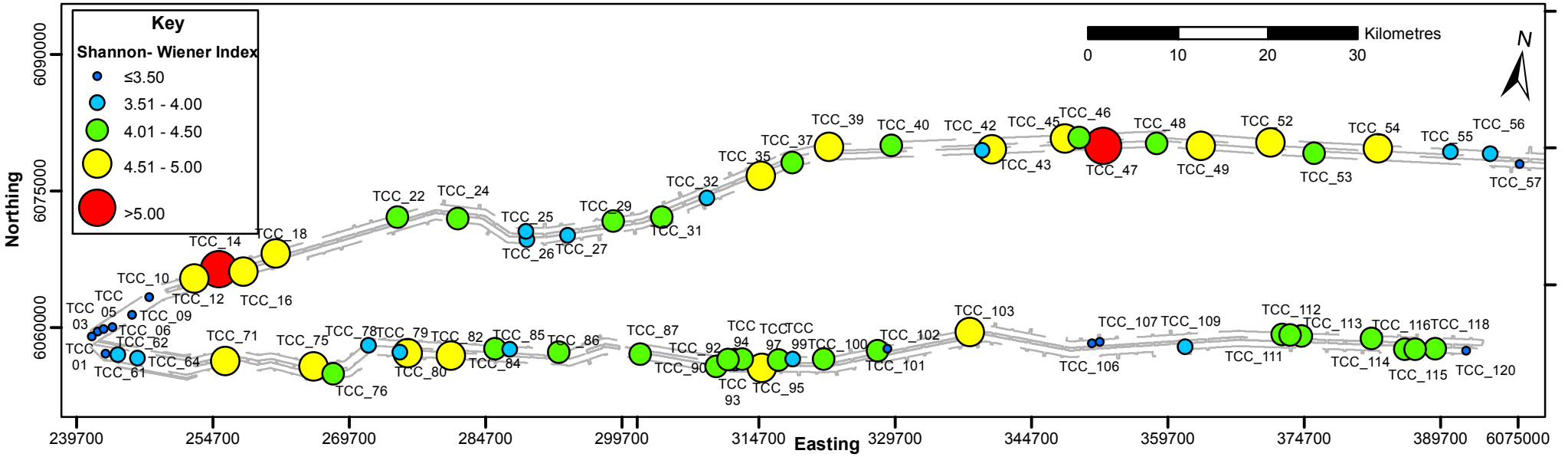
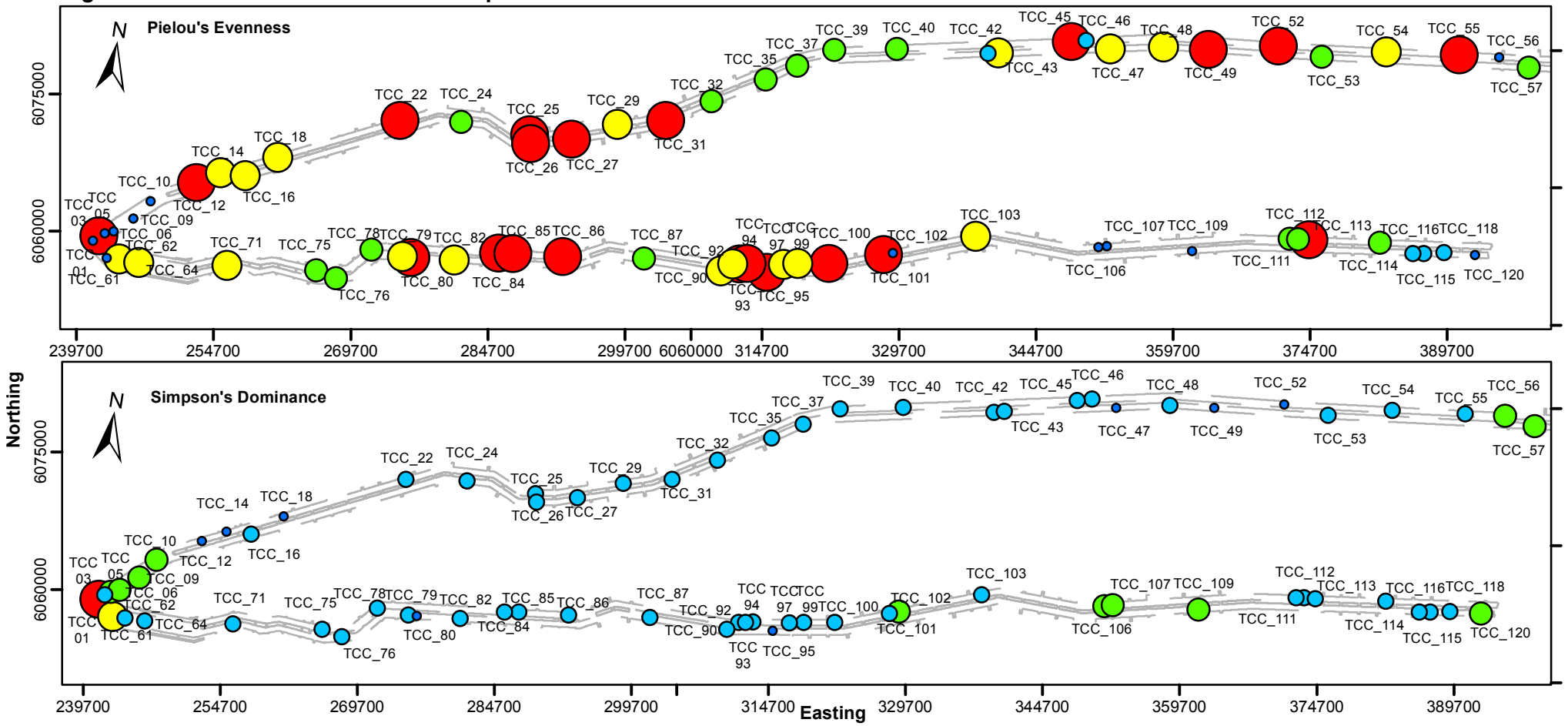


Figure 4.9 Pielou's Evenness and Simpson's Dominance Indices - TCC



4.6.3 Multivariate analyses

In comparison to univariate statistics, multivariate analyses enable subtle trends within data sets to be identified. Multivariate analyses were performed on the rationalised data using PRIMER v6 (Plymouth Marine Laboratories). Prior to undertaking analyses, both the full and adult data sets were subjected to a square root transformation, in order to down-weight the influence of the more numerically dominant species. A Bray-Curtis similarity matrix was produced based on the transformed abundance data, from which CLUSTER and MDS routines were performed. The Bray-Curtis similarity dendrogram and MDS plot are presented in **Figure 4.10**.

A SIMPROF permutation test was conducted on the data set in conjunction with the CLUSTER analysis to look for statistically significant evidence of genuine clusters in the community data, the results of which are overlain on the dendrogram presented in **Figure 4.10**. Red lines join stations that were statistically indistinguishable, while black lines join stations which were statistically different from one another.

The SIMPROF routine show four large clusters in the dendrogram (Clusters a, g, k and m) consisting of a combined total of 46 stations, with a further five smaller clusters each encompassing three to four stations (Clusters d, e, I, n and o); three stations formed pairs joined by red lines, but these do not constitute true clusters due to the permutative nature of SIMPROF. The remaining three stations (TCC_18, TCC_46 and TCC_71) were distinct from each other and all other stations. The MDS ordination, **Figure 4.11a** with overlain SIMPROF clusters as symbols provides a more graphical representation of the similarities between samples. Clusters g, i and k were grouped tightly towards the centre left of the ordination while the remaining clusters and groups are more loosely separated. With a moderately high stress value of 0.22, the MDS ordination should be treated with caution as a two-dimensional representation of the overall similarity between the stations.

The distribution of the Bray-Curtis SIMPROF groups along the TCC routes is presented in **Figure 4.12** and is suggestive of variable community compositions consistent with the spatial extent of the routes. Cluster a was identified as distinct from all other stations and consisted of the stations closest to shore on both routes (TCC_01, TCC_03, TCC_05, TCC_06, TCC_61, TCC_62 and TCC_64). Cluster k dominated the offshore section of the Northern route, while the majority of stations belonging to cluster g were located on the Southern route.

The MDS ordination overlain with the Modified Folk results (**Figure 4.11b**) did not reveal any clear association with sediment type, although stations grouped in the centre of the plot appear to consist of mainly slightly gravelly sand, with more loosely associated stations consisting of gravelly sand, gravelly muddy sand and muddy sandy gravel.

A SIMPER routine was used to establish the primary taxa that may explain the separation of the clusters as well as those that contribute to statistical significance within clusters. The top four contributing taxa to within-cluster similarities are given in **Table 4.9**. Of the two major clusters, *Astrorhiza*, *S. armiger, E. tenuis* and *P. jeffreysii* were the most influential taxa within cluster g, while *G. oculata, P. jeffreysii,* Ophiuroidea juv. and *O. fusiformis* were

the top four taxa within cluster k. *Echinocyamus pusillus* was the most influential to similarities within both clusters d and e, while *S. bombyx* contributed the most to similarities within both clusters m and n. *Magelona johnstoni* and *A. fabula* contributed the most to the separation of cluster a.

Table 4.9 Similarities within Faunal Bray-Curtis Clusters (SIMPER)

Cluster	Number of Stations	Water Depths (m LAT)	Predominant Sediments	Dominant Taxa	Cumulative Contribution to similarities (%)
a	7	6 -24m	Sand and muddy sand	*Magelona johnstoni* *Angulus fabula* *Nephtys* juv. *Abra prismatica*	23.23 33.24 42.95 50.31
d	3	52-55m	Gravelly sand and muddy sandy gravel	*Echinocyamus pusillus* *Hydroides norvegicus* Serpulidae *Lumbrineris cingulata*	10.52 20.61 30.23 38.60
e	3	57-58m	Sand and gravelly sand	*Echinocyamus pusillus* *Ophelia borealis* *Spiophanes bombyx* *Cerianthus lloydii*	20.04 34.29 46.33 52.70
g	14	59-73m	Sand	*Astrorhiza* *Scoloplos (Scoloplos) armiger* *Ennucula tenuis* *Paramphinome jeffreysii*	10.81 19.96 26.93 33.56
i	4	63-81m	Sand	Ophiuroidea juv. *Paramphinome jeffreysii* *Scoloplos (Scoloplos) armiger* *Harpinia antennaria*	10.85 20.12 27.95 35.16
k	17	67-83m	Sand and gravelly sand	*Galathowenia oculata* *Paramphinome jeffreysii* Ophiuroidea juv. *Owenia fusiformis*	11.14 21.12 29.22 36.01
m	8	43-62	Sand and gravelly sand	*Spiophanes bombyx* Ophiuroidea juv. *Amphiura filiformis* *Nucula nitidosa*	14.33 23.64 30.13 36.20
n	3	37-43m	Gravelly sand and sandy gravel	*Spiophanes bombyx* *Lagis koreni* *Pholoe baltica (Sensu Peterson)* Nemertea	17.61 26.02 33.18 38.00
o	3	57-66m	Sand	Ophiuroidea juv. *Chaetozone setosa* Echinoidea juv. *Spiophanes bombyx*	18.63 33.02 46.29 58.03

A combination of the most abundant abovementioned taxa, and taxa with lower abundances but more even distributions, are responsible for dissimilarities between clusters. Notably, clusters g and k are separated on the basis of higher relative

abundances of many of the most dominant taxa, such as *G. oculata* and *P. jeffreysii* in cluster k and their lower abundances in cluster g.

A total of nine stations did not belong to or form any clusters, suggesting highly variable community compositions. Stations TCC_09, TCC_10, TCC_12, TCC_14, TCC_18 and TCC_71 were all located relatively nearshore in poorly sorted mixed sediments. Stations TCC_09 and TCC_10 recorded the highest fines and TOC and highest levels of hydrocarbons within the survey. Taxa which contributed to the separation of Stations TCC_09 and TCC_10 included higher abundances of *Phoronis, Amphiura filiformis* and an absence of the most dominant species *S. bombyx*. Stations TCC_57 and TCC_120 occur at the end of each survey route on the Dogger Bank, where depths are shallower.

Stations distinct from all other stations were a result of unique faunal assemblages, which may be attributed to spatial distribution or sediment characteristics. Station TCC_71 (SIMPROF outlier b) recorded the highest abundances of *Lumbrineris cingulata, Peresiella clymenoides* and *Ampelisca spinipes* across the survey area. Station TCC_46 (SIMPROF outlier h) recorded the highest abundances of *Ampharete lindstroemi* and *Notomastus latericeus* and the second highest abundance of *P. jeffreysii* but a notable absence of many of the other most characterising species. Station TCC_18 (SIMPROF outlier j) is separated from cluster k mainly due to its comparatively low abundance of *G. oculata*, a slightly higher abundance of *Ennucula tenuis* and the presence of *Hydroides norvegicus. H. norvegicus* is a calcareous tube-forming polychaete, and as such is found attached to hard surfaces. This species was concentrated in the coarser sediments found towards the west of both cable routes.

Distributions of *S. bombyx, G. oculata*, Ophiuroidea juveniles and *M. johnstoni* across the TCC survey routes, along with MDS ordinations overlain with bubbles representing species abundance are presented in **Figures 4.13** to **4.16**.

Figure 4.10 Bray-Curtis Similarity Dendrogram of Faunal Data

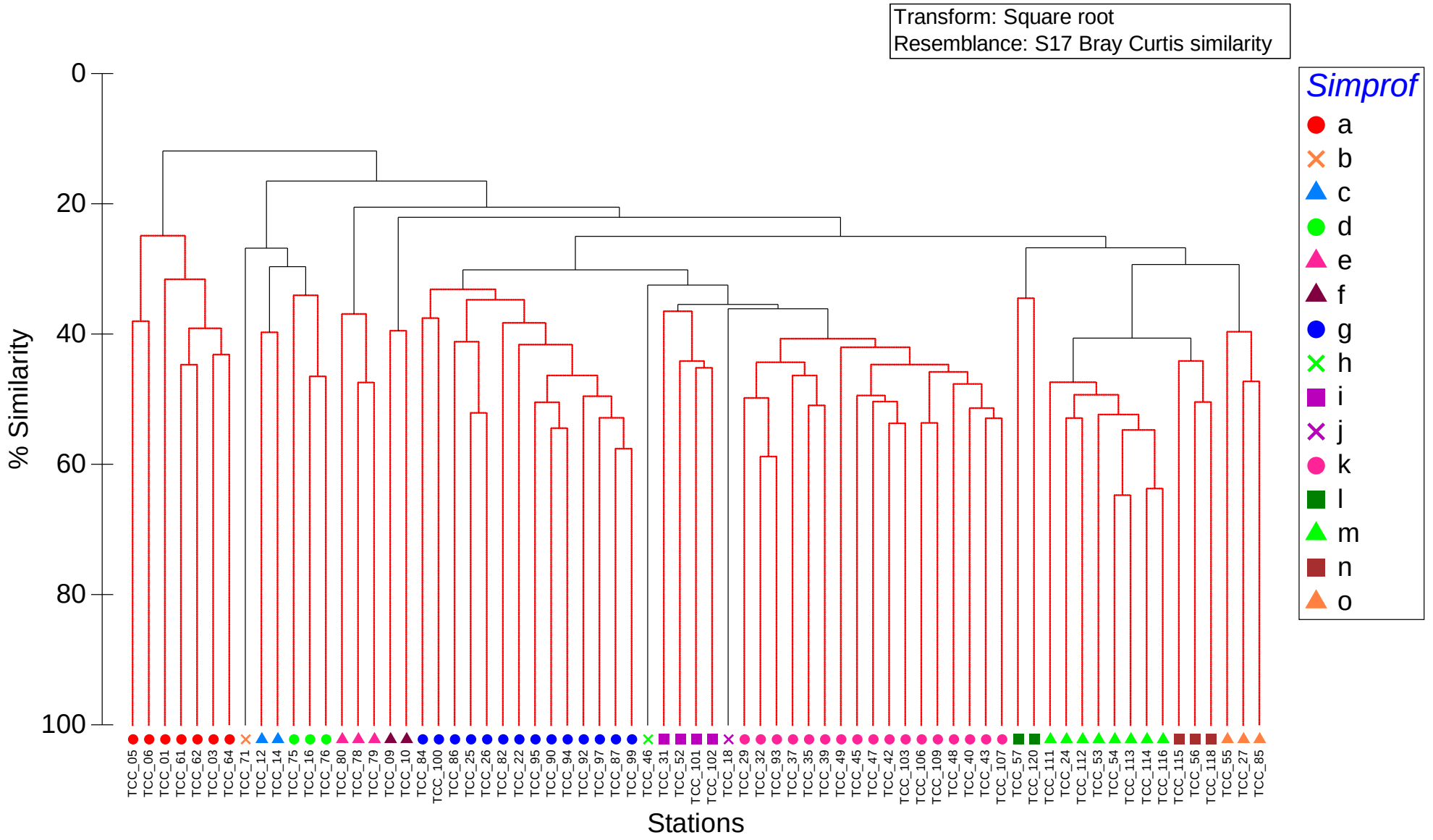
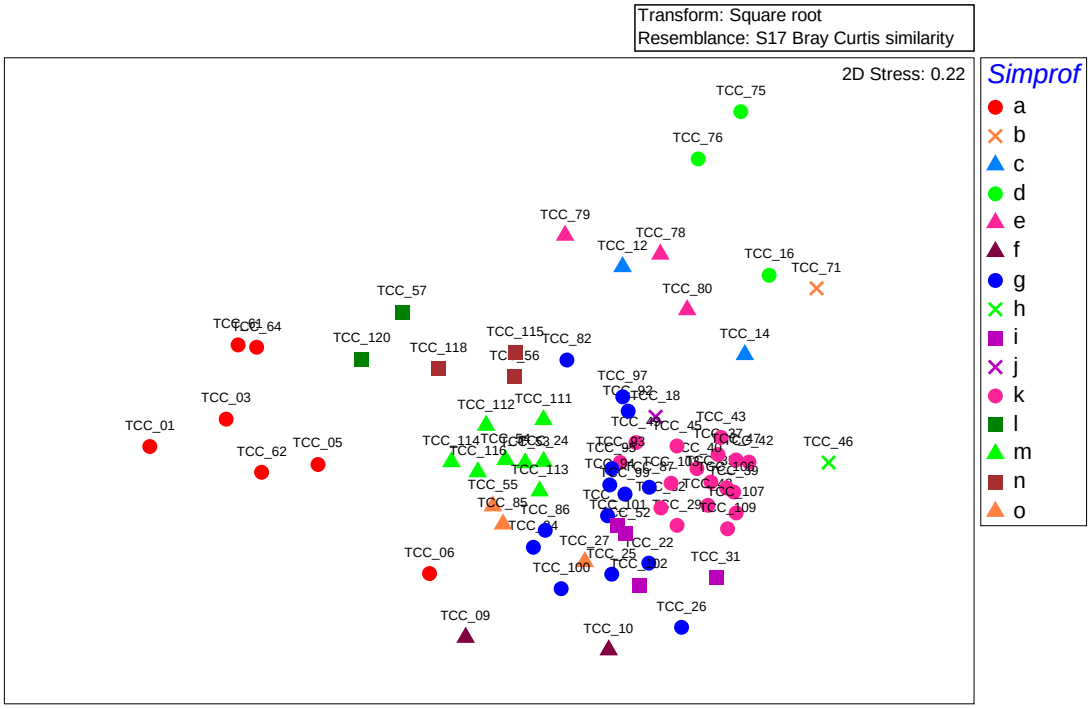


Figure 4.11 Fauna MDS Ordination

a) Simprof Groups



b) Modified Folk Classification

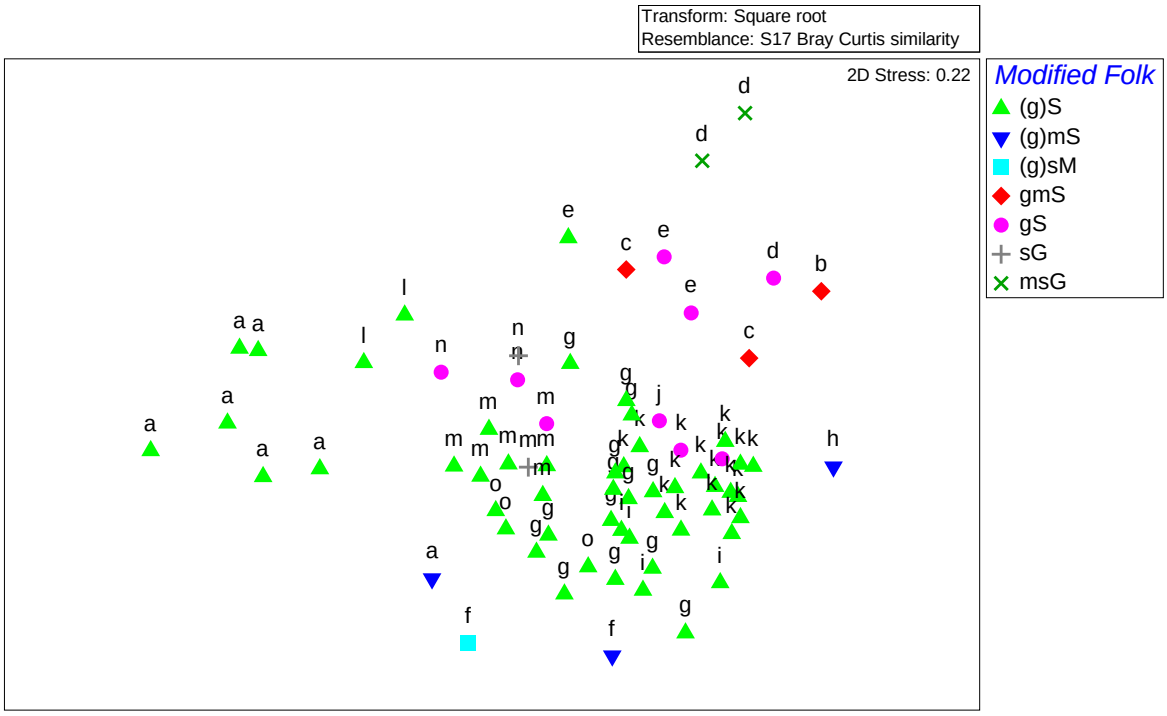


Figure 4.12 Distribution of SIMPROF Groups - TCC

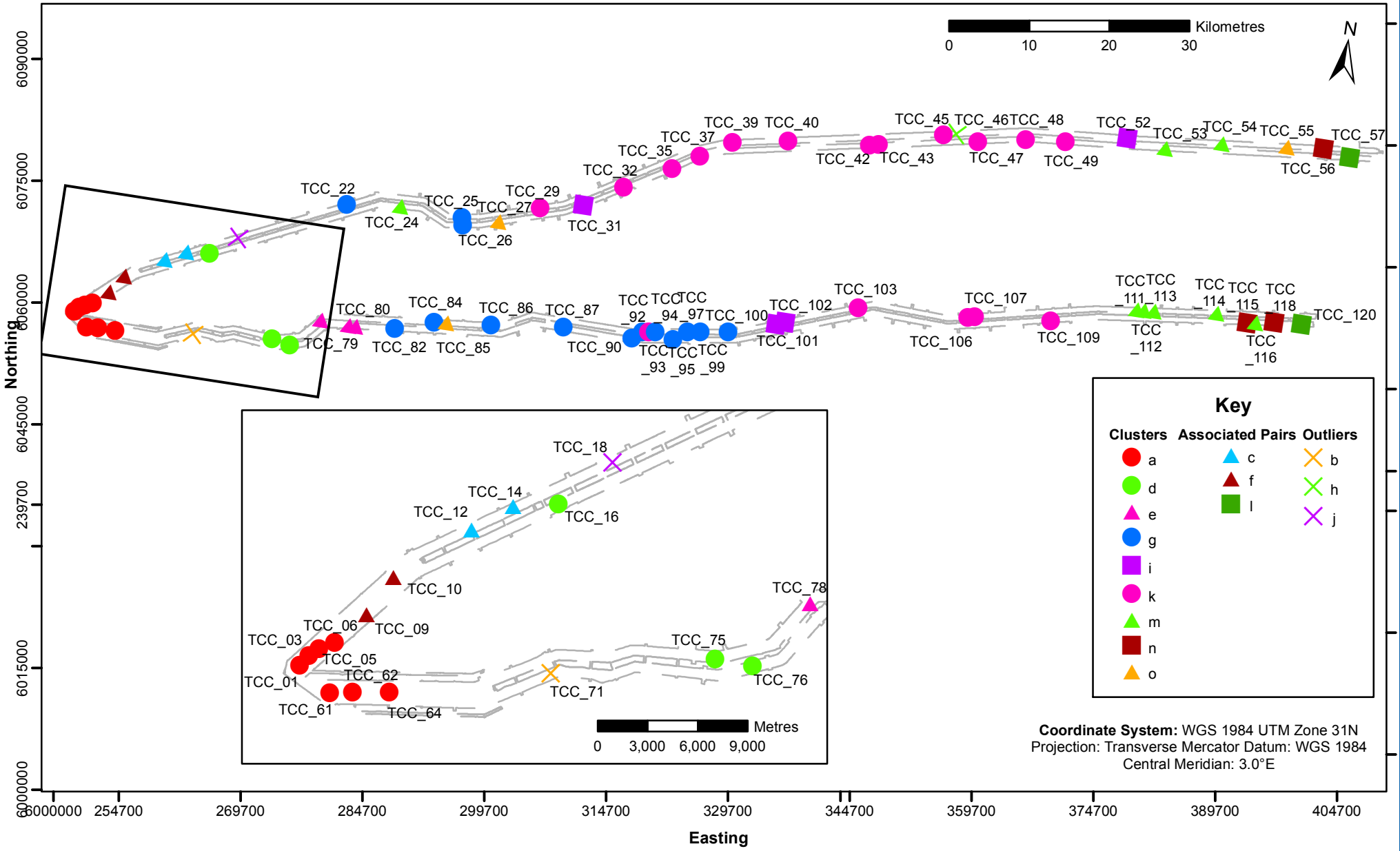
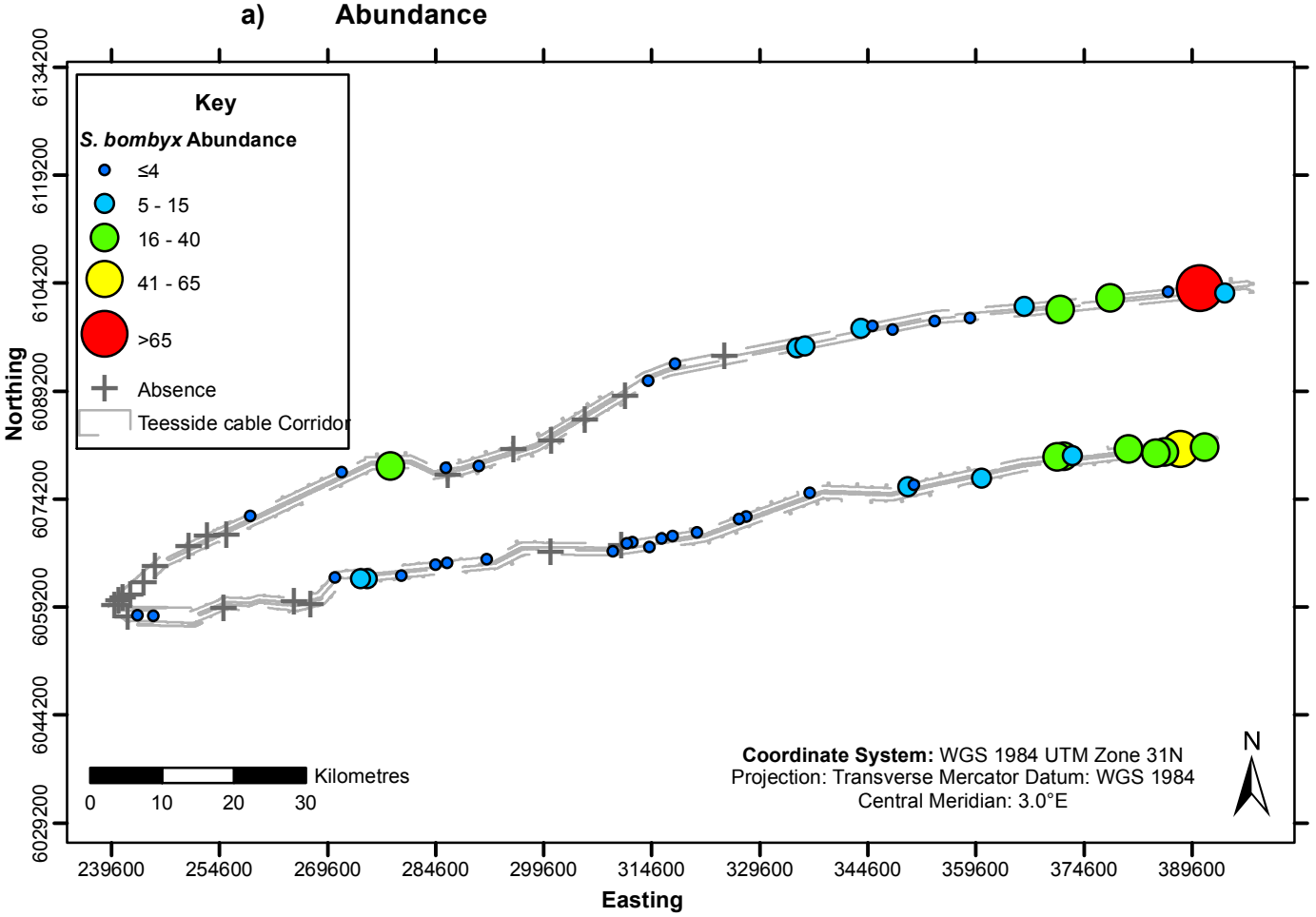


Figure 4.13 Distribution and abundance of *Spiophanes bombyx*

a) Abundance



b) Bubble Plot

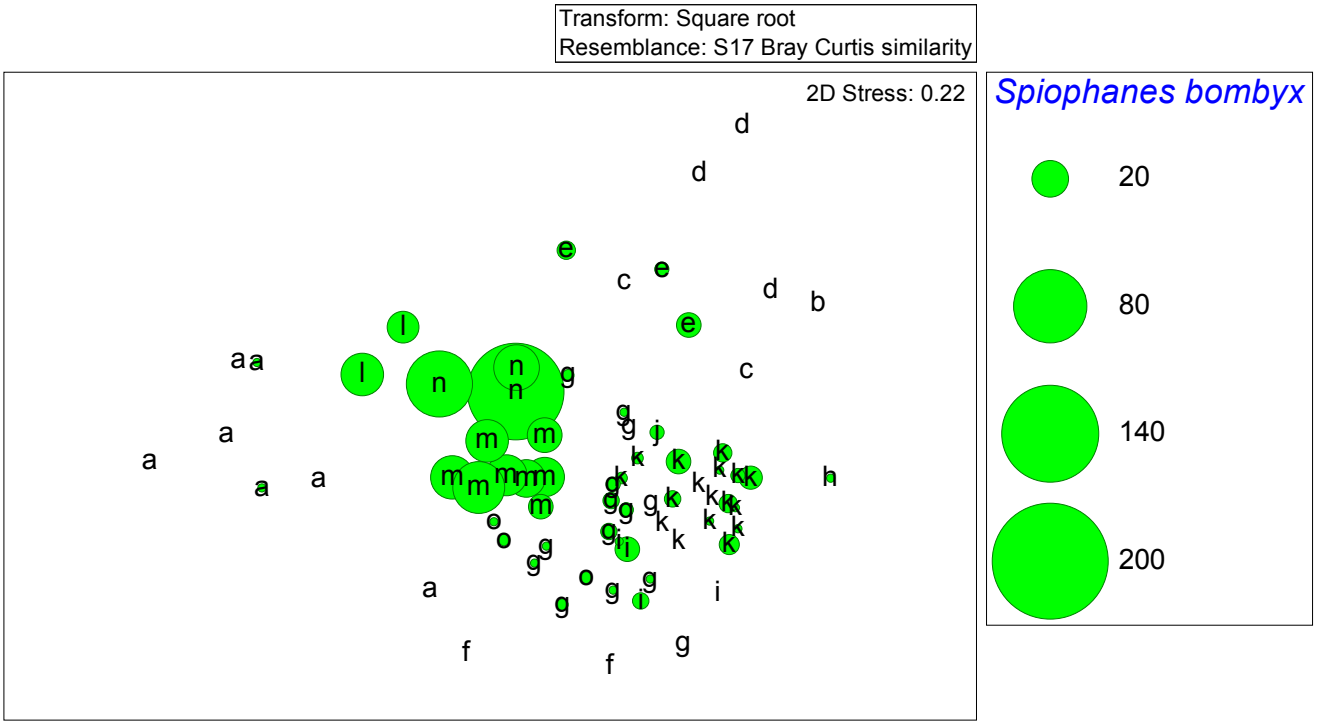
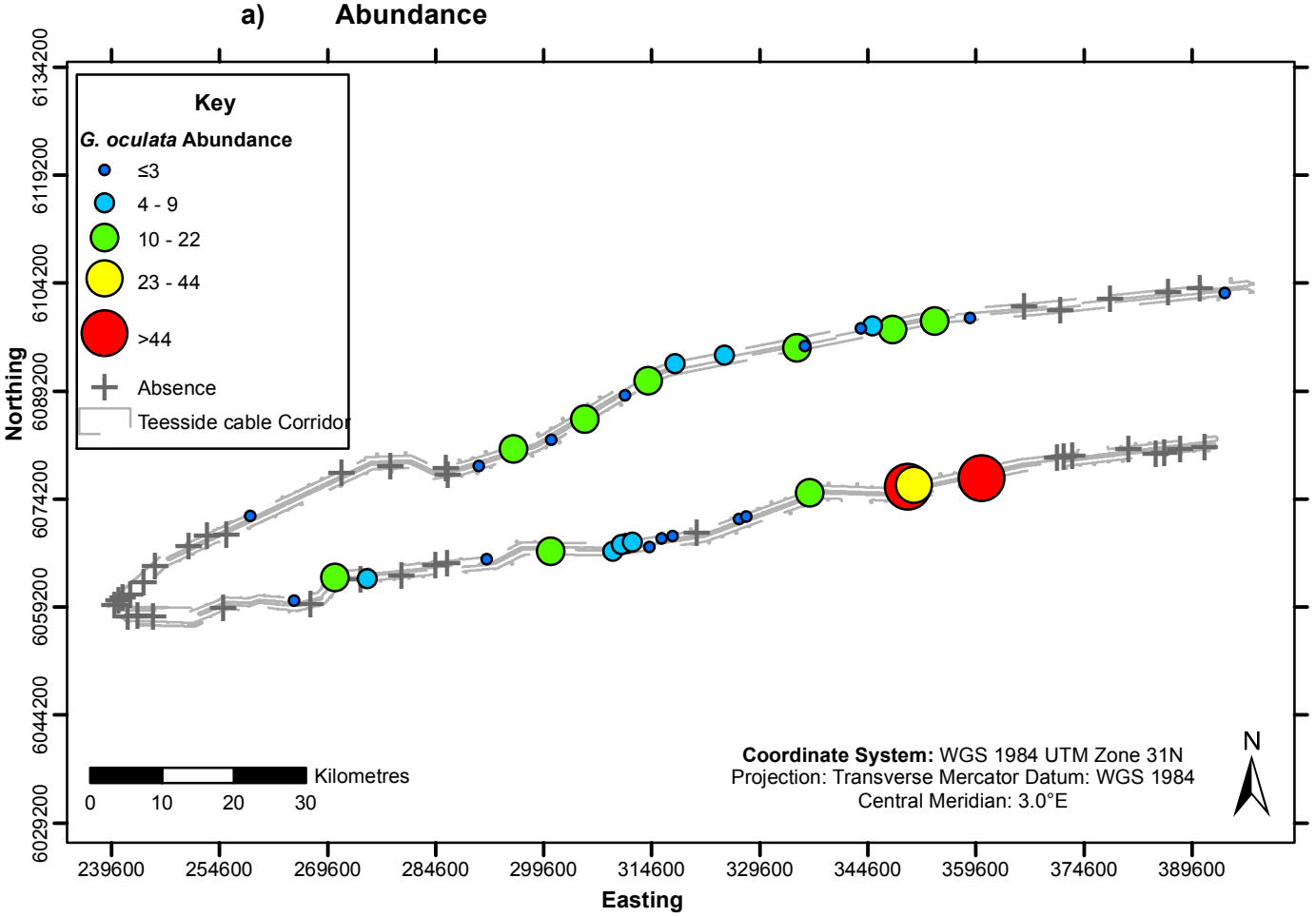


Figure 4.14 Distribution and abundance of *Galathowenia oculata*

a) Abundance



b) Bubble Plot

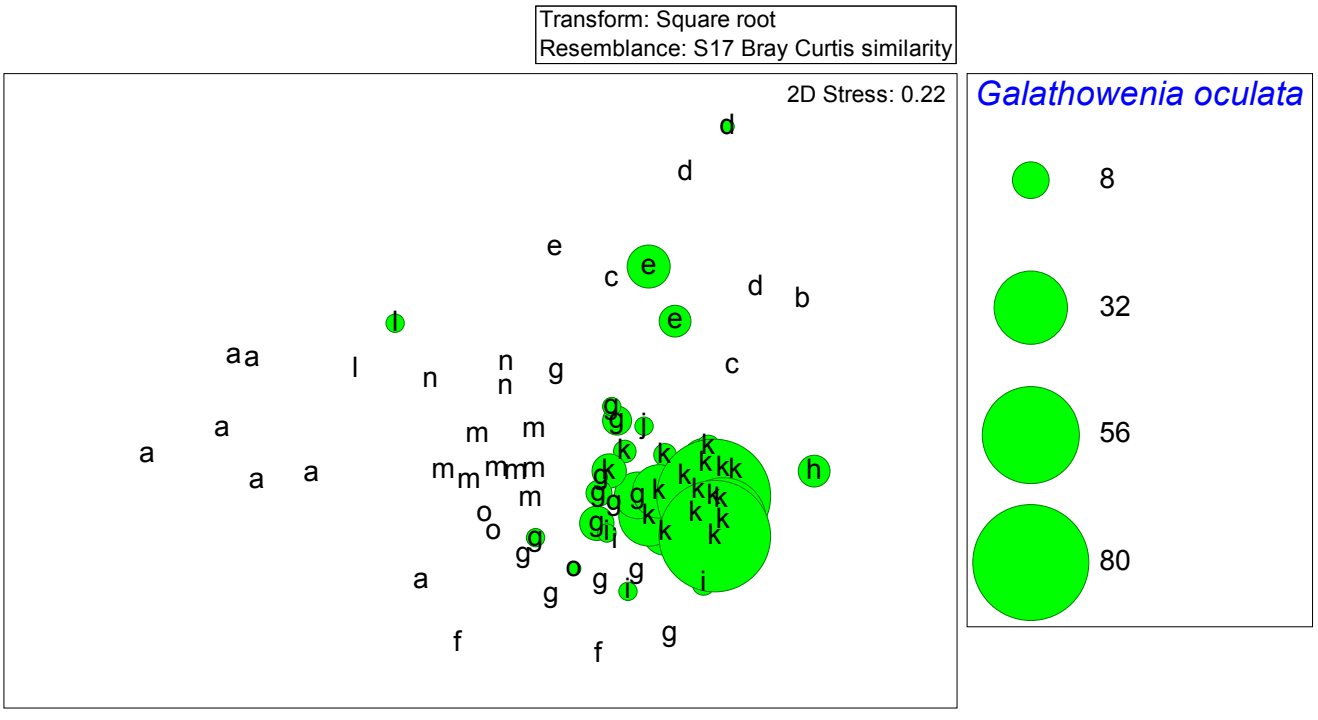
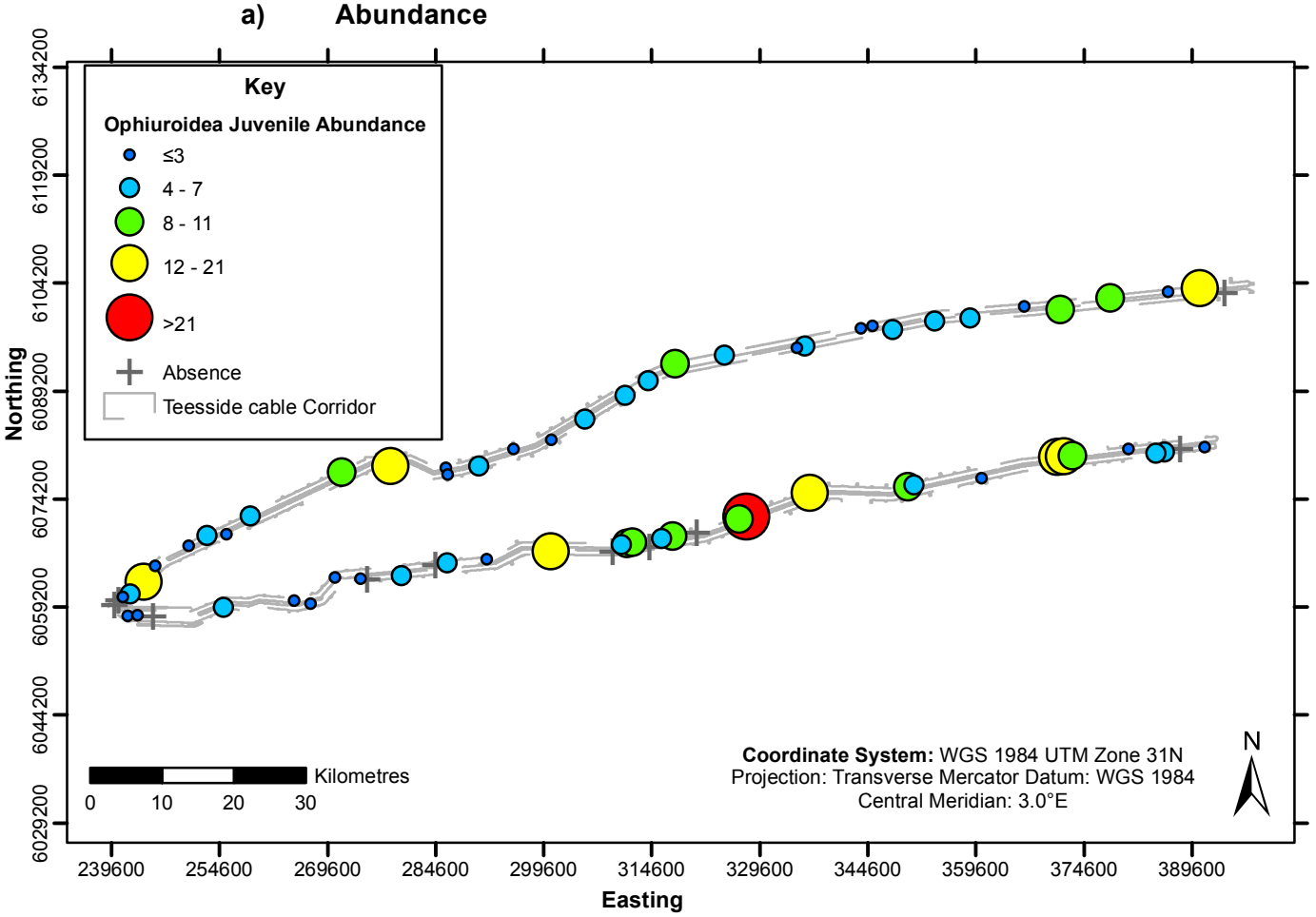


Figure 4.15 Distribution and abundance of Ophiuroidea juveniles

a) Abundance



b) Bubble Plot

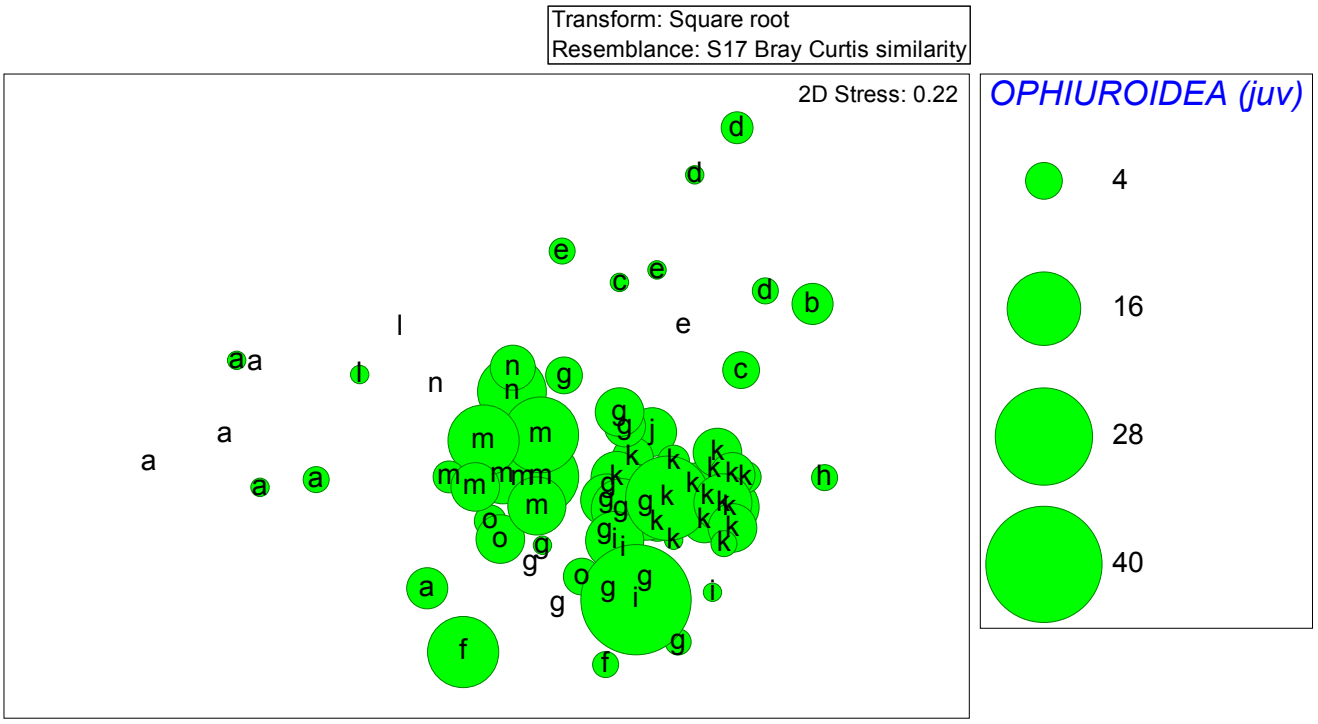
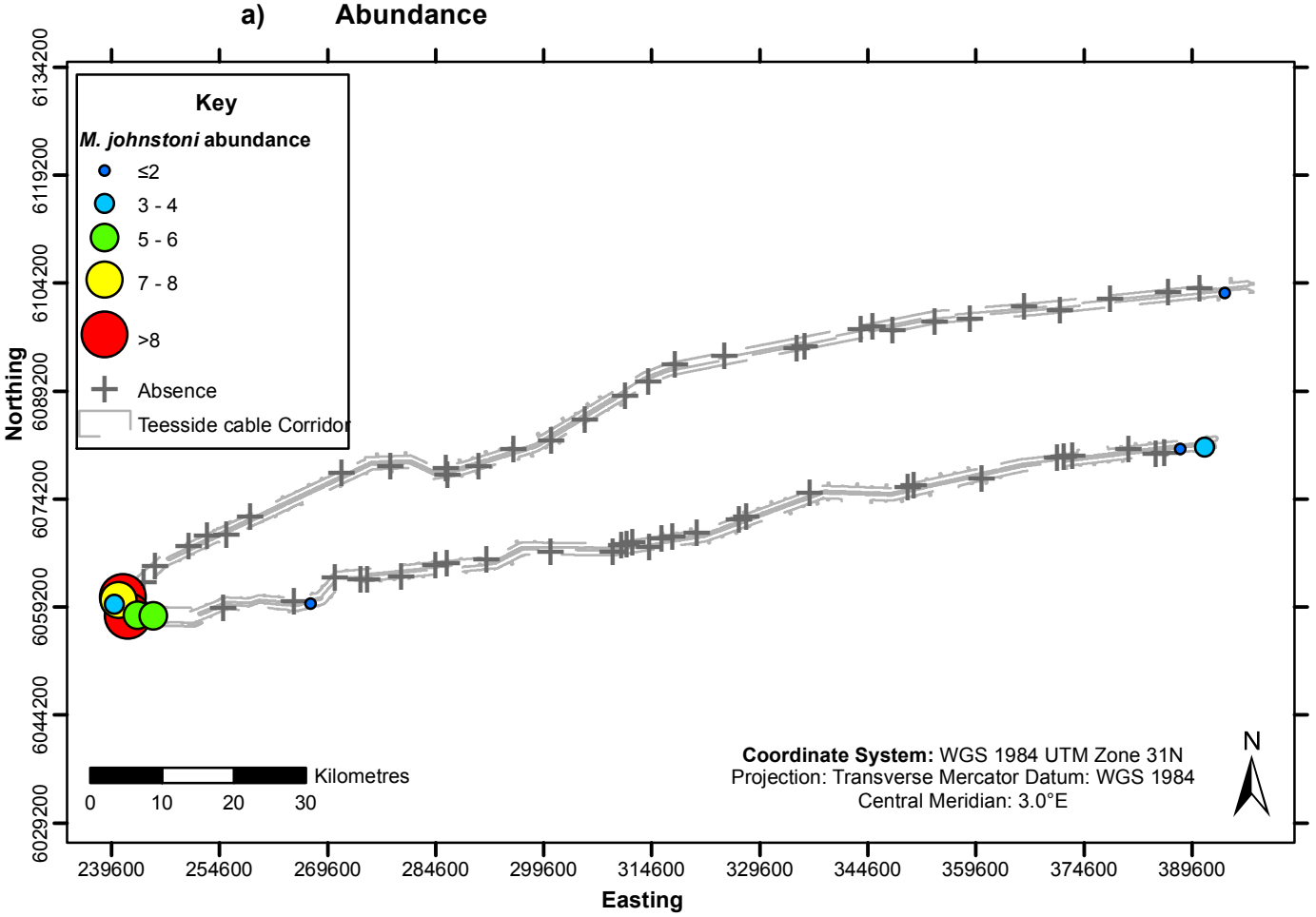
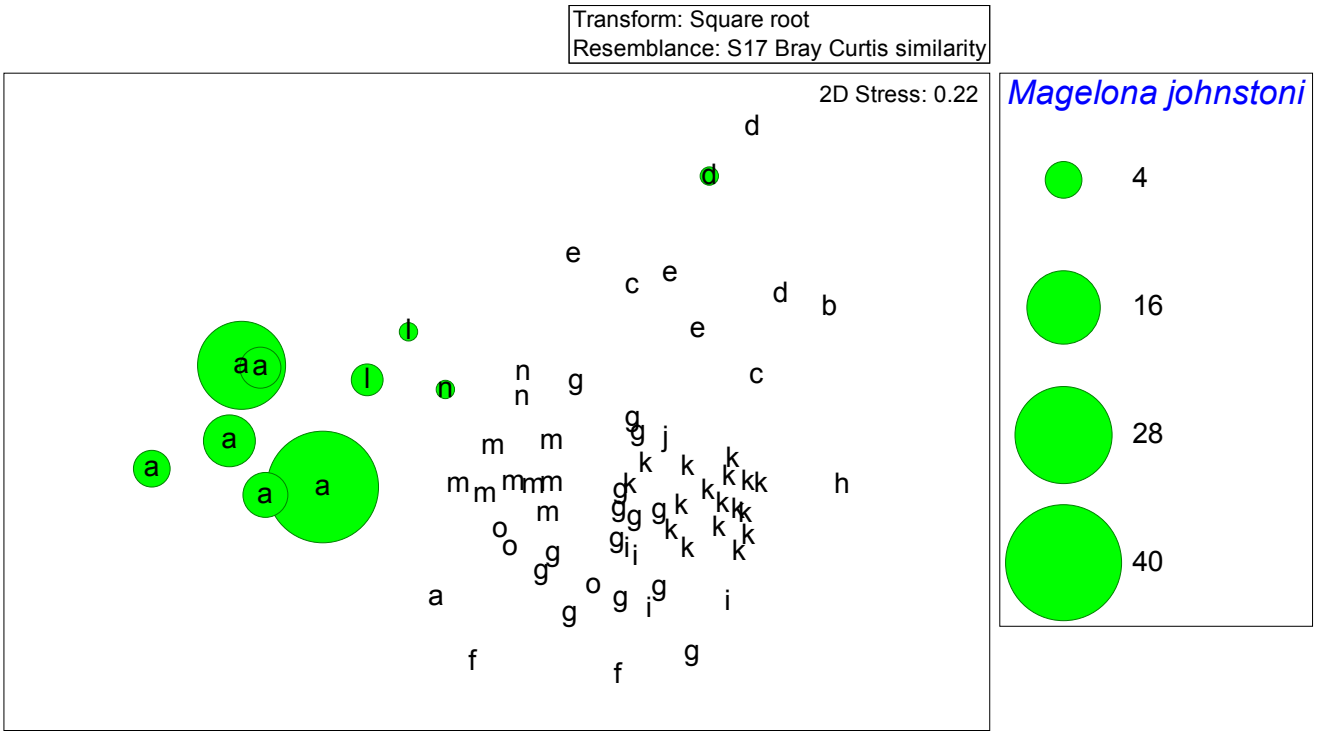


Figure 4.16 Distribution and abundance of *Magelona johnstoni*

a) Abundance



b) Bubble Plot



4.7 Biotope Classification

In an attempt to further characterise the seabed environment (biological and physical), a biotope classification has been carried out, from which a biotope map has been produced. Sediments within the TCC survey routes have been classified following the top-down approach given by Connor *et al.* (2004) into biotope complexes (EUNIS Level 4) using analysis of geophysical data, seabed imagery, PSA and macrofaunal community composition. Where possible, further classification to biotopes (EUNIS Level 5, and on one occasion, Level 6) has been attempted. Detailed notes on each station are presented in **Appendix F**. Distribution of the biotope classifications for each station has been overlain on the seabed features identified by the geophysical survey (**Figures 4.17**).

Water depths (reduced to m LAT) at all stations ranged from between 3m and 83m and as such placed all stations within the sublittoral zone. Stations with depths of up to 15-20m were considered to be infralittoral and stations of >20m depth were considered to be circalittoral. When taking into account the location, depth, geophysical data, visual sediment characteristics and PSA and macrofaunal results (where available) it was identified that under EUNIS Level 3 these stations could be classified as mainly sublittoral sands or sublittoral sandy mud with some sublittoral coarse sediment and infralittoral and circalittoral rock habitats. Based on the sediment characteristics and fauna observed at each station, further classification was taken to Level 4 for all stations, and to Level 5/6 where possible.

The main biotope complexes identified to EUNIS Level 4 and Levels 5 and 6 (where applicable) are summarised in **Table 4.10** and detailed in **Sections 4.8.1 to 4.8.4** (descriptions from Connor *et al.,* 2004). Where an overlap of two biotopes was identified this station was described in terms of a biotope mosaic.

Table 4.10 Summary of Biotope Classification Including Mosaics

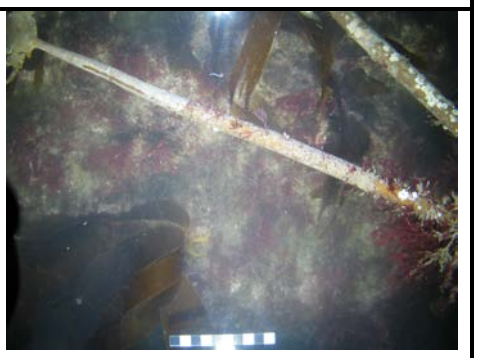
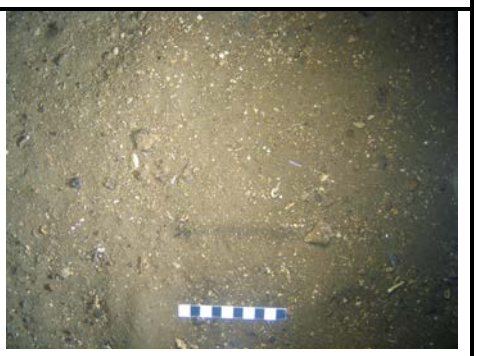
EUNIS/JNCC Code and Name	Number of stations (n=120)	Representative Seabed Image
Biotope Complex (EUNIS Level 4)		
EUNIS: A3.21 **JNCC: IR.MIR.KR** Kelp and red seaweeds (moderate energy infralittoral rock)	2	 TCC_CAM_02 (Fix 28)
EUNIS: A5.23 **JNCC: SS.SSa.IFiSa** Infralittoral fine sand	5	 TCC_CAM_64 (Fix 352)
EUNIS: A5.24 **JNCC: SS.SSa.IMuSa** Infralittoral muddy sand	1	 TCC_CAM_05 (Fix 68)
EUNIS: A5.14 **JNCC: SS.SCS.CCS** Circalittoral coarse sediment	14	 TCC_CAM_19 (Fix 41)

Table 4.10 Summary of Biotope Classification Including Mosaics Continued

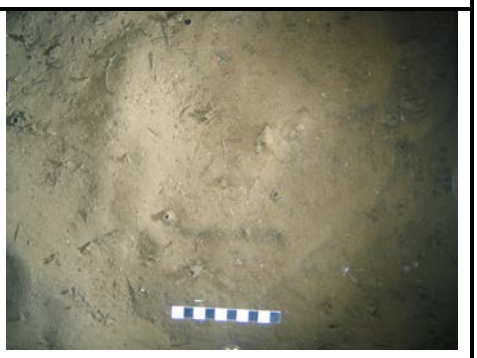
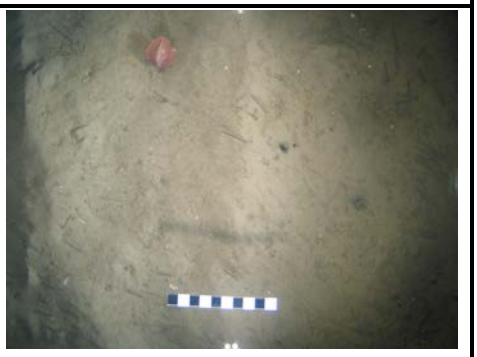
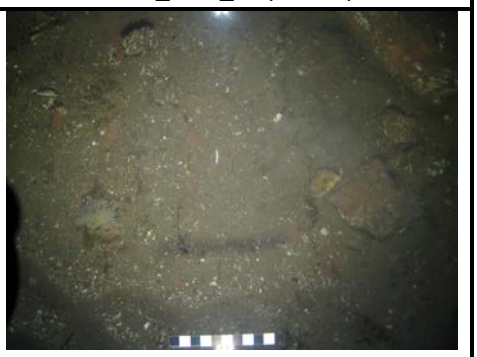
EUNIS/JNCC Code and Name	Number of stations (n=120)	Representative Seabed Image
Biotope Complex (EUNIS Level 4)		
EUNIS: A5.25 **JNCC: SS.SSa.CFiSa** Circalittoral fine sand	49	 TCC_CAM_35 (Fix 283)
EUNIS: A5.26 **JNCC: SS.SSa.CMuSa** Circalittoral muddy sand	13	 TCC_CAM_43 (Fix 915)
EUNIS: A5.35 **JNCC: SS.SMu.CSaMu** Circalittoral sandy mud	2	 TCC_CAM_09 (Fix 119)
EUNIS: A5.44 **JNCC: SS.SMx.CMx** Circalittoral mixed sediment	5	 TCC_CAM_14 (Fix 150)

Table 4.10 Summary of Biotope Classification Including Mosaics Continued

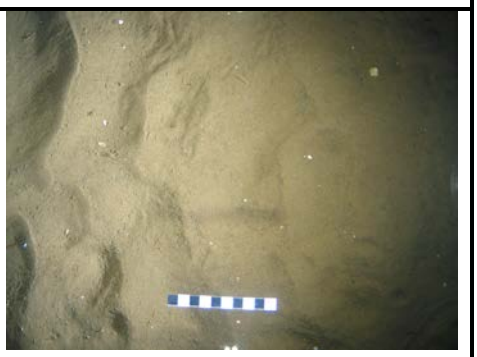
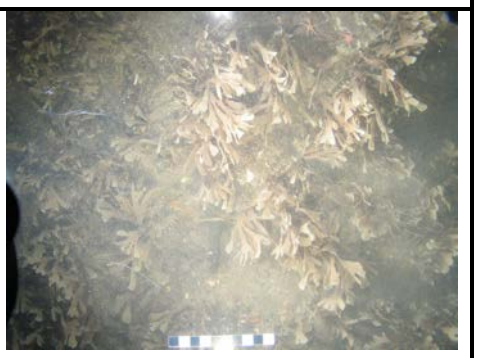
EUNIS/JNCC Code and Name	Number of stations (n=120)	Representative Seabed Image
Biotope Complex (EUNIS Level 4)		
EUNIS: A5.25 with A5.14 **JNCC: SS.SSa.CFi with SS.SCS.CCS** Mosaic of circalittoral fine sand with circalittoral coarse sediment	11	 TCC_CAM_78 (Fix 388)
EUNIS: A5.14 with A4.214 **JNCC: SS.SCS.CCS with CR.MCR.EcCr.FaAlCr** Mosaic of circalittoral coarse sediment with faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock	10	 TCC_CAM_23 (Fix 123)
Biotopes and Sub-biotopes (EUNIS Levels 5 and 6)		
EUNIS: A5.252 **JNCC: SS.SSa.CFiSa.ApriBatPo** *Abra prismatica, Bathyporeia elegans* and polychaetes in circalittoral fine sand	1	 TCC_CAM_111 (Fix 883)
EUNIS: A4.214 **JNCC: CR.MCR.EcCr.FaAlCr** Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock	6	 TCC_CAM_65 (Fix 356)

Table 4.10 Summary of Biotope Classification Including Mosaics Continued

EUNIS/JNCC Code and Name	Number of stations (n=120)	Representative Seabed Image
Biotopes and Sub-biotopes (EUNIS Levels 5 and 6)		
EUNIS: A4.2141 **JNCC: CR.MCR.EcCr.FaAlCr.Flu** *Flustra foliacea* on slightly scoured silty circalittoral rock (Level 6)	1	 TCC_CAM_67 (Fix 204)

3.8.1 TCC Northern Route – Western Nearshore Section (*c.*KP1 to KP18; TCC_01 to TCC_14)

Sediments at these stations were highly variable, with areas of outcropping bedrock with boulders and cobbles, interspersed with fine sand and muddy sand. The following biotopes were identified along this section of the route:

- Infralittoral fine sand (A5.23; Stations TCC_01 and TCC_03) in up to 20m of water. Clean sands which occur in shallow water. This habitat typically lacks a significant seaweed component and is characterised by robust fauna, particularly amphipods and robust polychaetes.

- Infralittoral muddy sand (A5.24; Station TCC_05). Non-cohesive muddy sand (with between 5% and 20% silt/clay) in up to 20m of water. This habitat supports a variety of animal-dominated communities, particularly polychaetes, bivalves and the urchin *Echinocardium cordatum*.

- Circalittoral muddy sand (A5.26; Station TCC_06). Non-cohesive muddy sand (with between 5% and 20% silt/clay) in depths of over 15 to 20m of water. This habitat supports animal-dominated communities characterised by a wide variety of polychaetes, bivalves and echinoderms such as *Amphiura* spp., *Ophiura* spp and *Astropecten irregularis*. These circalittoral habitats tend to be more stable than their infralittoral counterparts and as such support a richer infaunal community.

- Circalittoral sandy mud (A5.35; TCC_09 and TCC_10). Cohesive sandy mud (typically over 20% silt/clay) generally found in water depths of over 10m, and up to 100m. Sea pens such as *Virgularia mirabilis* and brittlestars such as *Amphiura* spp. are particularly characteristic of this habitat whilst infaunal species include the tube building polychaetes *Lagis koreni* and *Owenia fusiformis*, and deposit feeding bivalves such as *Kurtiella bidentata* and *Abra* spp.

- Kelp and red seaweed on moderate energy infralittoal rock (A3.21; Stations TCC_02 and TCC_04). Infralittoral rock subject to moderate wave exposure with

kelp growth on bedrock and stable boulders in up to 20m of water. Associated with the kelp are communities of seaweeds, predominantly reds and including a greater variety of more delicate filamentous types than found on more exposed coasts.

- Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock (A4.214; TCC_07 and TCC_08). This biotope typically occurs on the vertical and upper faces of wave-exposed and moderately wave-exposed circalittoral bedrock or boulders subject to mostly moderate to weak tidal streams. This biotope is dominated by faunal and algal (e.g. Corallinaceae) crusts and tends to have a grazed appearance; which may be partially attributable to the abundance of *Echinus esculentus* found here. *Alcyonium digitatum* is one of the few species to stand erect from the encrusted rock surface and are frequently encountered on the tops of rocky outcrops and boulders. The substratum may be interspersed with other encrusting species such as the encrusting polychaete *Spirobranchus*. Other species present include *Asterias rubens, Ophiothrix fragilis, Urticina feline, Pagurus bernhardus* and *Flustra foliacea.*

- *Flustra foliacea* on slightly scoured silty circalittoral rock (A4.2141; Station TCC_67). This variant of A4.214 above is typically found on the upper faces of moderately wave-exposed circalittoral bedrock or boulders. These rocky patches may be interspersed with gravelly sand patches, causing a scouring effect. From afar, the substrate appears dominated by the bryozoan *Flustra foliacea*. *Alcyonium digitatum* and *Spirobranchus* may also be seen attached to the rocky substratum. Echinoderms that may be seen include *Asterias rubens* and *Ophiothrix fragilis.* Sparse clumps of the hydroids *Thuiaria thuja, Abietinaria abientine, Nemertesia antennina* and *Tubularia indivisa* may occasionally be seen. This biotope is known to occur along the north-east coast of England.

3.8.2 TCC Southern Route – Western Nearshore Section (*c.*KP2 to KP30; TCC_61 to TCC_76)

Sediments at these stations were similar to those on the Northern route nearshore; highly variable with areas of outcropping bedrock with boulders and cobbles, interspersed with sand and gravel. The following biotopes were identified along this section of the route:

- Infralittoral fine sand (A5.23; Stations TCC_61, TCC_62 and TCC_64)

- Circalittoral coarse sediment (A5.14; Stations TCC_69 and TCC_73). Tide-swept circalittoral coarse sands gravel and shingle generally in depths of over 15-20m. This habitat, as with shallower coarse sediments, may be characterised by robust infaunal polychaetes, mobile crustacean and bivalves.

- Circalittoral mixed sediment (A5.44; Stations TCC_71, TCC_75 and TCC_76). Heterogeneous sediments found from the extreme low water mark to deep offshore circalittoral habitats. These habitats incorporate a range of sediments including heterogeneous muddy gravelly sands and also mosaics of cobbles and pebbles embedded in or lying upon sand, gravel or mud. There is a degree of

confusion within this biotope complex, as many habitats could be defined as containing mixed sediments, depending on the sampling method employed. For the purpose of this survey, sediments containing a mixture of mud, gavel and sand were defined as mixed, using the BGS Modified Folk triangle if PSA data was available. These habitats may support a wide range of infauna and epibiota including polychaetes, bivalves, echinoderms, anemones, hydroids and bryozoans.

- Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock (A4.214; Stations TCC_63, TCC_65, TCC_66 to TCC_68)

- Mosaic of circalittoral coarse sediment and faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock (A5.14/A4.214; Stations TCC_70, TCC_72, TCC_74)

3.8.3 TCC Northern Route – Offshore Section (*c.*KP20 to KP169; TCC_15 to TCC_60)

Sediments along the northern route consisted of mainly fine sand, interspersed with areas of coarse sediment and occasional patches of rock. The following biotopes were identified along this section of the route:

- Circalittoral fine sand (A5.25; TCC_20, TCC_22, TCC_24 to TCC_32, TCC_34, TCC_35, TCC_38, TCC_39, TCC_51, TCC_52, TCC_54, TCC_55, TCC_57 and TCC_59) in 10 to 50m of water. Clean fine sands with less than 5% silt/clay. This habitat is characterised by a wide range of echinoderms, polychaetes and bivalves. This habitat may also extend offshore and is generally more stable than shallower, infralittoral sands and consequently supports a more diverse community.

- Circalittoral muddy sand (TCC_17 and TCC_23)

- Circalittoral coarse sediment (A5.14; TCC_15, TCC_16, TCC_18, TCC_19, TCC_21, TCC_33, TCC_36, TCC_58 and TCC_60).

- Mosaic of circalittoral fine sand and circalittoral coarse sediment (A5.25/A5.14; TCC_37, TCC_44, TCC_45, TCC_53, TCC_56)

- Mosaic of circalittoral coarse sediment and faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock (A5.14/A4.214;

3.8.4 TCC Southern Route – Offshore section (*c.*KP33 to KP156; TCC_77 to TCC_120)

Sediments along the offshore section of the northern route consisted of mainly fine sand, interspersed with areas of coarse sediment and occasional patches of rock. The following biotopes were identified along this section of the route:

- Circalittoral fine sand (A5.25; TCC_82, TCC_84 to TCC_88, TCC_90, TCC_92 to TCC_95, TCC_99 to TCC_105, TCC_09 to TCC_110, TCC_112 to TCC_114, TCC_116, TCC_117, TCC_119 and TCC_120)

- *Abra prismatica, Bathyporeia elegans* and polychaetes in circalittoral fine sand (A5.252; TCC_111). This Level 5 biotope occurs in circalittoral and offshore medium to fine sands between 25m and 100m. The faunal community is characterised by the bivalve *Abra prismatica*, the amphipod *Bathyporeia elegans* and polychates such as *Scoloplos armiger, Spiophanes bombyx, Chaetozone setosa* and *Ophelia borealis*. This biotope has been reported in the central and northern North Sea (Eleftheriou and Basford , 1989).

- Circalittoral coarse sediment (A5.14; TCC_77)

- Mosaic of circalittoral fine sand and circalittoral coarse sediment (A5.25/A5.14; TCC_78 to TCC_80, TCC_96, TCC_116 and TCC_118)

- Mosaic of circalittoral coarse sediment and faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock (A5.14/A4.214; TCC_83, TCC_89, TCC_91, and TCC_99)

- Circalittoral muddy sand (A5.26; TCC_106 to TCC_108)

Figure 4.17a Biotope Classification - TCC Northern Route

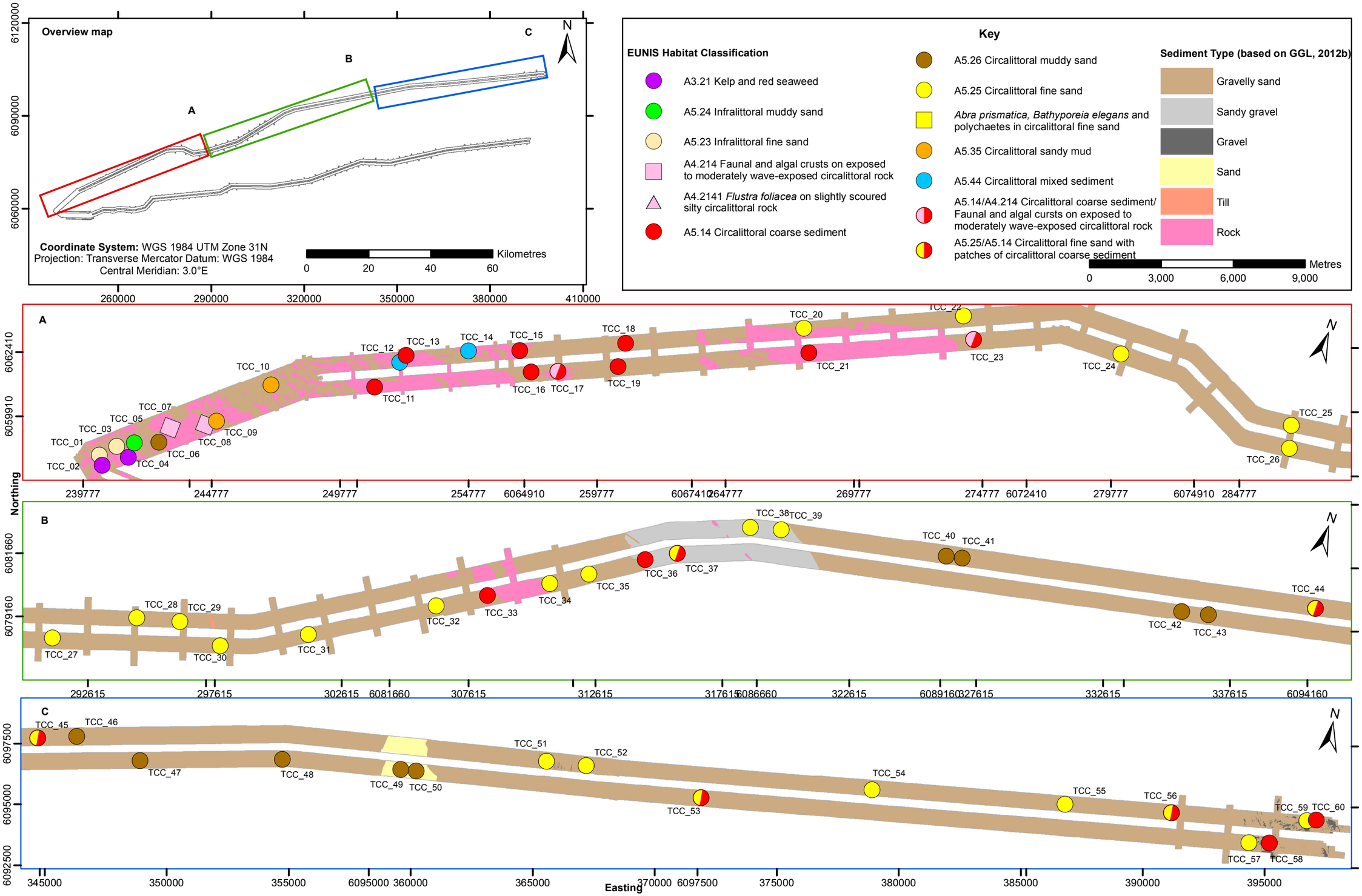
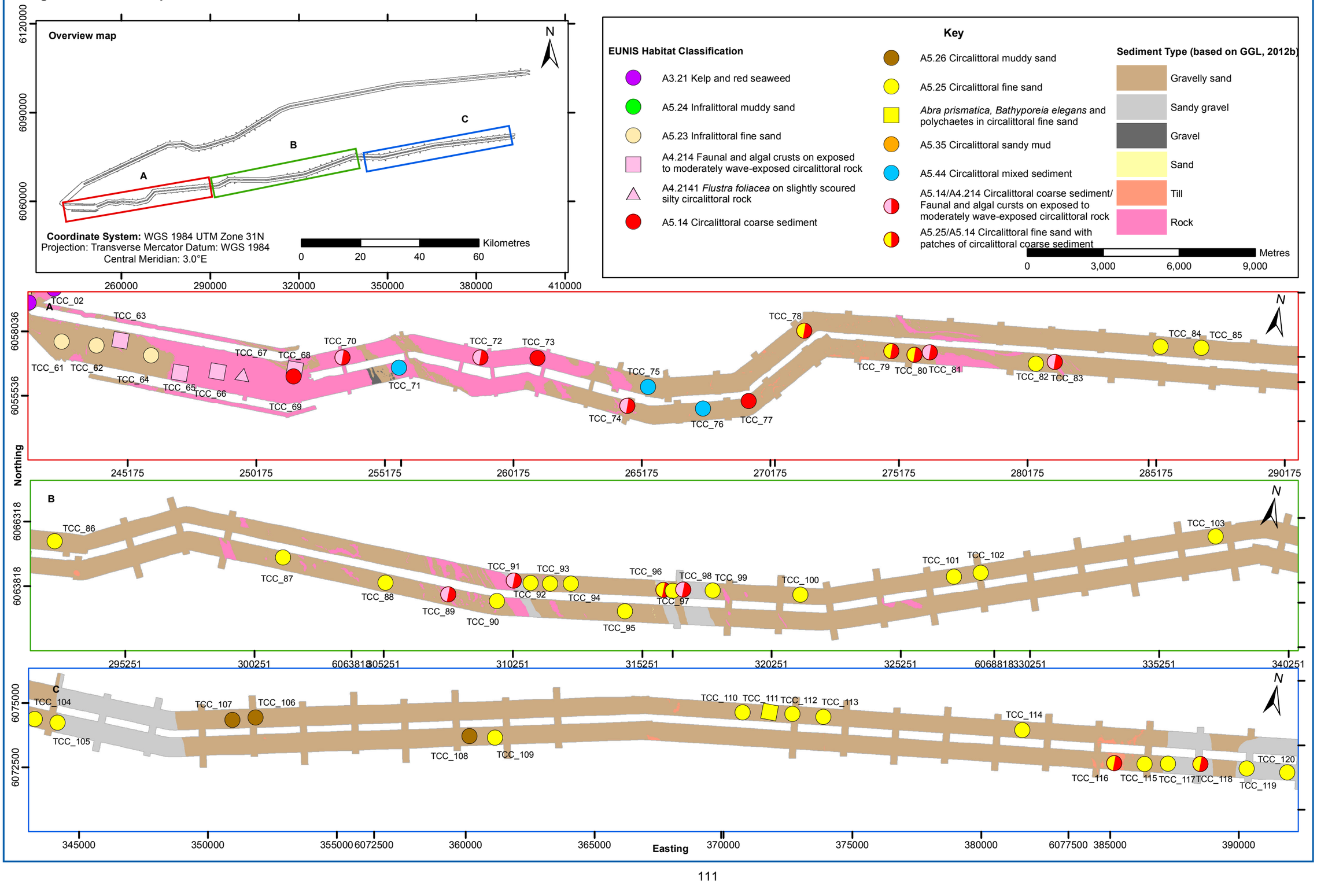


Figure 4.17b Biotope Classification - TCC Southern Route



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APPENDIX A – FIELD SAMPLING LOGS

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
21-Jul-2012	4:15:21	1	TB_21			Camera	30	433810	6104918	433801	6104934	-8.61	15.93	18	152		
21-Jul-2012	4:19:34	2	TB_21			Camera	30	433801	6104905	433801	6104934	0.00	28.71	29	180		
21-Jul-2012	4:21:24	3	TB_21			Camera	31	433818	6104907	433801	6104934	-16.96	27.50	32	148		
21-Jul-2012	4:23:52	4	TB_21			Camera	31	433828	6104900	433801	6104934	-27.31	34.11	44	141		
21-Jul-2012	4:26:01	5	TB_21			Camera	4	433820	6104890	433801	6104934	-19.34	43.59	48	156		Noise from Propellers
21-Jul-2012	4:26:44	6	TB_21			Camera	10	433799	6104905	433801	6104934	1.71	28.66	29	183		Noise from Propellers
21-Jul-2012	4:29:30	7	TB_21			Camera	30	433792	6104913	433801	6104934	9.23	20.67	23	204		
21-Jul-2012	4:30:46	8	TB_21			Camera	30	433788	6104909	433801	6104934	12.53	25.40	28	206		
21-Jul-2012	4:33:35	9	TB_21			Camera	33	433787	6104928	433801	6104934	13.77	5.90	15	247		
21-Jul-2012	5:17:28	10	TB_46			Camera	34	435166	6105640	435157	6105627	-8.89	-13.38	16	34		
21-Jul-2012	5:17:54	11	TB_46			Camera	34	435167	6105641	435157	6105627	-9.82	-14.03	17	35		
21-Jul-2012	5:20:22	12	TB_46			Camera	33	435169	6105635	435157	6105627	-12.49	-8.35	15	56		
21-Jul-2012	5:22:38	13	TB_46			Camera	33	435181	6105620	435157	6105627	-23.50	7.09	25	107		
21-Jul-2012	5:25:11	14	TB_46			Camera	33	435157	6105602	435157	6105627	-0.33	25.10	25	179		
21-Jul-2012	5:26:57	15	TB_46			Camera	33	435144	6105598	435157	6105627	13.19	29.04	32	204		
21-Jul-2012	5:28:04	16	TB_46			Camera	35	435135	6105593	435157	6105627	22.40	33.65	40	214		
21-Jul-2012	5:28:21	17	TB_46			Camera	33	435137	6105590	435157	6105627	20.13	37.09	42	208		
21-Jul-2012	5:31:00	18	TB_46			Camera	34	435144	6105601	435157	6105627	13.32	25.72	29	207		
21-Jul-2012	6:02:01	19	TB_48			Camera	38	436740	6104320	436729	6104315	-10.69	-5.46	12	63		
21-Jul-2012	6:04:08	20	TB_48			Camera	36	436728	6104318	436729	6104315	0.81	-2.76	3	344		
21-Jul-2012	6:05:33	21	TB_48			Camera	36	436725	6104311	436729	6104315	4.03	4.32	6	223		
21-Jul-2012	6:07:28	22	TB_48			Camera	36	436717	6104306	436729	6104315	12.36	8.79	15	235		
21-Jul-2012	6:10:30	23	TB_48			Camera	36	436723	6104310	436729	6104315	6.48	4.93	8	233		
21-Jul-2012	6:14:48	24	TB_48			Camera	36	436718	6104313	436729	6104315	11.36	2.05	12	260		
21-Jul-2012	6:16:58	25	TB_48			Camera	36	436736	6104318	436729	6104315	-6.94	-3.16	8	66		
21-Jul-2012	6:20:02	26	TB_48			Camera	36	436728	6104297	436729	6104315	1.15	18.25	18	184		
21-Jul-2012	7:12:48	27	TB_39			Camera	33	439346	6103273	439328	6103252	-17.94	-20.74	27	41		
21-Jul-2012	7:12:59	28	TB_39			Camera	33	439346	6103273	439328	6103252	-17.87	-20.79	27	41		
21-Jul-2012	7:13:34	29	TB_39			Camera	33	439346	6103276	439328	6103252	-17.72	-24.06	30	36		
21-Jul-2012	7:14:19	30	TB_39			Camera	33	439348	6103280	439328	6103252	-20.49	-27.74	34	36		
21-Jul-2012	7:15:37	31	TB_39			Camera	33	439356	6103275	439328	6103252	-28.13	-22.54	36	51		
21-Jul-2012	7:17:06	32	TB_39			Camera	34	439363	6103270	439328	6103252	-34.91	-17.70	39	63		
21-Jul-2012	7:18:18	33	TB_39			Camera	33	439368	6103266	439328	6103252	-40.45	-14.24	43	71		
21-Jul-2012	7:19:29	34	TB_39			Camera	32	439372	6103263	439328	6103252	-43.51	-11.02	45	76		
21-Jul-2012	7:20:54	35	TB_39			Camera	29	439368	6103263	439328	6103252	-39.74	-10.57	41	75		
21-Jul-2012	7:22:47	36	TB_39			Camera	35	439356	6103262	439328	6103252	-27.82	-10.26	30	70		
21-Jul-2012	7:24:11	37	TB_39			Camera	33	439348	6103265	439328	6103252	-19.94	-13.29	24	56		
21-Jul-2012	7:25:48	38	TB_39			Camera	32	439338	6103268	439328	6103252	-10.26	-16.33	19	32		
21-Jul-2012	7:28:11	39	TB_39			Camera	33	439333	6103267	439328	6103252	-4.71	-15.34	16	17		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
21-Jul-2012	7:28:32	40	TB_39			Camera	33	439333	6103268	439328	6103252	-4.71	-15.91	16	13		
21-Jul-2012	7:29:28	41	TB_39			Camera	33	439332	6103268	439328	6103252	-4.05	-16.05	17	14		
21-Jul-2012	8:34:17	42	TB_30			Camera	31	438994	6099879	438961	6099870	-32.70	-9.10	34	74		Fix delayed due to Beacon problem
21-Jul-2012	8:35:25	43	TB_30			Camera	32	438985	6099877	438961	6099870	-23.90	-6.68	25	74		
21-Jul-2012	8:37:25	44	TB_30			Camera	30	438990	6099877	438961	6099870	-29.34	-6.67	30	77		
21-Jul-2012	8:38:51	45	TB_30			Camera	30	438980	6099880	438961	6099870	-19.19	-9.58	21	63		
21-Jul-2012	8:39:54	46	TB_30			Camera	30	438971	6099885	438961	6099870	-9.72	-14.67	18	34		
21-Jul-2012	8:40:57	47	TB_30			Camera	30	438967	6099890	438961	6099870	-6.31	-19.70	21	18		
21-Jul-2012	8:42:06	48	TB_30			Camera	30	438956	6099895	438961	6099870	4.90	-25.45	26	349		
21-Jul-2012	8:43:38	49	TB_30			Camera	30	438948	6099896	438961	6099870	13.31	-25.59	29	333		
21-Jul-2012	8:44:29	50	TB_30			Camera	31	438954	6099898	438961	6099870	7.48	-27.57	29	345		
21-Jul-2012	8:45:22	51	TB_30			Camera	31	438957	6099900	438961	6099870	3.51	-30.25	30	353		
21-Jul-2012	10:03:25	52	TB_16			Camera	29	445716	6097623	445732	6097606	15.54	-16.90	23	317		
21-Jul-2012	10:05:04	53	TB_16			Camera	29	445706	6097629	445732	6097606	26.00	-22.52	34	311		
21-Jul-2012	10:07:26	54	TB_16			Camera	31	445699	6097632	445732	6097606	33.24	-25.73	42	308		
21-Jul-2012	10:08:39	55	TB_16			Camera	30	445694	6097627	445732	6097606	38.37	-20.74	44	298		
21-Jul-2012	10:09:52	56	TB_16			Camera	29	445687	6097624	445732	6097606	45.15	-18.11	49	292		
21-Jul-2012	10:12:32	57	TB_16			Camera	29	445697	6097627	445732	6097606	34.61	-21.07	41	301		
21-Jul-2012	10:13:09	58	TB_16			Camera	30	445700	6097628	445732	6097606	32.23	-22.04	39	304		
21-Jul-2012	10:15:51	59	TB_16			Camera	29	445707	6097623	445732	6097606	25.19	-16.93	30	304		
21-Jul-2012	10:18:34	60	TB_16			Camera	29	445708	6097612	445732	6097606	23.71	-5.87	24	284		
21-Jul-2012	10:55:53	61	TB_10			Camera	29	446838	6098705	446851	6098655	13.18	-49.90	52	345		
21-Jul-2012	10:58:21	62	TB_10			Camera	29	446824	6098686	446851	6098655	26.72	-31.46	41	320		
21-Jul-2012	11:00:02	63	TB_10			Camera	4	446831	6098688	446851	6098655	20.34	-33.07	39	328		Noise from propellers
21-Jul-2012	11:01:38	64	TB_10			Camera	29	446845	6098664	446851	6098655	5.87	-8.85	11	326		
21-Jul-2012	11:05:52	65	TB_10			Camera	30	446880	6098666	446851	6098655	-29.47	-11.02	31	70		
21-Jul-2012	11:07:39	66	TB_10			Camera	26	446887	6098666	446851	6098655	-36.03	-10.85	38	73		
21-Jul-2012	11:09:04	67	TB_10			Camera	29	446894	6098656	446851	6098655	-42.50	-1.44	43	88		
21-Jul-2012	11:11:16	68	TB_10			Camera	4	446889	6098682	446851	6098655	-38.24	-26.50	47	55		Noise from propellers
21-Jul-2012	11:12:30	69	TB_10			Camera	29	446882	6098672	446851	6098655	-30.63	-16.61	35	62		
21-Jul-2012	16:52:59	70	TB_33			Camera	35	442652	6106594	442662	6106592	9.52	-2.04	10	282		
21-Jul-2012	16:55:06	71	TB_33			Camera	35	442670	6106592	442662	6106592	-8.36	0.41	8	93		
21-Jul-2012	16:56:59	72	TB_33			Camera	36	442678	6106585	442662	6106592	-16.37	6.63	18	112		
21-Jul-2012	16:58:07	73	TB_33			Camera	35	442685	6106580	442662	6106592	-22.91	11.67	26	117		
21-Jul-2012	16:59:49	74	TB_33			Camera	35	442667	6106584	442662	6106592	-5.13	7.87	9	147		
21-Jul-2012	17:01:05	75	TB_33			Camera	35	442668	6106578	442662	6106592	-5.94	13.90	15	157		
21-Jul-2012	17:02:32	76	TB_33			Camera	36	442659	6106579	442662	6106592	2.88	12.63	13	193		
21-Jul-2012	17:03:03	77	TB_33			Camera	35	442659	6106581	442662	6106592	3.42	11.45	12	197		
21-Jul-2012	17:05:11	78	TB_33			Camera	35	442665	6106583	442662	6106592	-3.29	8.63	9	159		
21-Jul-2012	17:05:36	79	TB_33			Camera	35	442666	6106583	442662	6106592	-3.60	9.29	10	159		
21-Jul-2012	17:05:49	80	TB_33			Camera	36	442666	6106583	442662	6106592	-3.64	8.70	9	157		
21-Jul-2012	17:06:49	81	TB_33			Camera	35	442667	6106589	442662	6106592	-4.94	3.37	6	124		
21-Jul-2012	17:08:52	82	TB_33			Camera	35	442666	6106578	442662	6106592	-3.78	14.06	15	165		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
21-Jul-2012	17:09:31	83	TB_33			Camera	35	442666	6106579	442662	6106592	-3.78	13.24	14	168		
21-Jul-2012	17:10:36	84	TB_33			Camera	35	442653	6106577	442662	6106592	8.77	15.44	18	210		
21-Jul-2012	17:12:12	85	TB_33			Camera	35	442657	6106569	442662	6106592	5.50	22.71	23	194		
21-Jul-2012	17:43:32	86	TB_41			Camera	35	443783	6106430	443762	6106432	-20.98	2.48	21	97		
21-Jul-2012	17:44:34	87	TB_41			Camera	35	443786	6106429	443762	6106432	-23.81	2.77	24	97		
21-Jul-2012	17:45:49	88	TB_41			Camera	34	443782	6106430	443762	6106432	-19.62	2.29	20	97		
21-Jul-2012	17:47:05	89	TB_41			Camera	34	443783	6106428	443762	6106432	-20.98	4.26	21	101		
21-Jul-2012	17:48:17	90	TB_41			Camera	35	443783	6106431	443762	6106432	-21.02	0.56	21	92		
21-Jul-2012	17:49:23	91	TB_41			Camera	35	443780	6106430	443762	6106432	-17.69	1.88	18	96		
21-Jul-2012	17:50:33	92	TB_41			Camera	35	443781	6106426	443762	6106432	-18.52	5.84	19	108		
21-Jul-2012	17:51:42	93	TB_41			Camera	35	443770	6106425	443762	6106432	-8.29	7.21	11	131		
21-Jul-2012	17:52:46	94	TB_41			Camera	34	443765	6106423	443762	6106432	-3.09	8.53	9	160		
21-Jul-2012	17:53:08	95	TB_41			Camera	35	443759	6106421	443762	6106432	3.03	11.04	11	195		
21-Jul-2012	17:54:06	96	TB_41			Camera	35	443746	6106407	443762	6106432	15.73	24.87	29	212		
21-Jul-2012	17:55:10	97	TB_41			Camera	35	443742	6106425	443762	6106432	19.79	6.68	21	251		
21-Jul-2012	17:56:13	98	TB_41			Camera	35	443741	6106427	443762	6106432	21.17	5.16	22	256		
21-Jul-2012	17:57:23	99	TB_41			Camera	35	443741	6106430	443762	6106432	21.17	1.95	23	265		
21-Jul-2012	18:29:31	100	TB_42			Camera	34	445476	6106986	445443	6106978	-33.00	-8.02	34	76		
21-Jul-2012	18:30:06	101	TB_42			Camera	34	445483	6106988	445443	6106978	-39.89	-10.33	41	75		
21-Jul-2012	18:34:18	102	TB_42			Camera	33	445482	6106967	445443	6106978	-38.89	10.76	40	105		
21-Jul-2012	18:35:23	103	TB_42			Camera	33	445476	6106963	445443	6106978	-33.41	15.16	37	114		
21-Jul-2012	18:36:16	104	TB_42			Camera	33	445465	6106960	445443	6106978	-21.83	18.47	29	130		
21-Jul-2012	18:37:15	105	TB_42			Camera	33	445451	6106960	445443	6106978	-7.70	18.45	20	157		
21-Jul-2012	18:38:17	106	TB_42			Camera	33	445440	6106959	445443	6106978	2.63	18.71	19	188		
21-Jul-2012	18:39:28	107	TB_42			Camera	33	445444	6106955	445443	6106978	-1.06	22.59	23	177		
21-Jul-2012	18:40:34	108	TB_42			Camera	34	445434	6106967	445443	6106978	9.38	11.48	15	219		
21-Jul-2012	18:41:33	109	TB_42			Camera	33	445426	6106979	445443	6106978	17.17	-1.00	17	273		
21-Jul-2012	18:42:25	110	TB_42			Camera	33	445424	6106987	445443	6106978	19.16	-8.53	21	294		
21-Jul-2012	18:43:24	111	TB_42			Camera	33	445426	6106991	445443	6106978	16.55	-12.57	21	307		
21-Jul-2012	18:44:20	112	TB_42			Camera	33	445432	6106997	445443	6106978	10.85	-19.17	22	331		
21-Jul-2012	18:45:33	113	TB_42			Camera	34	445432	6107002	445443	6106978	10.85	-23.85	24	359		
21-Jul-2012	19:21:30	114	TB_36			Camera	32	445930	6105983	445923	6106013	-7.44	29.83	31	166		
21-Jul-2012	19:22:59	115	TB_36			Camera	33	445935	6105983	445923	6106013	-11.56	29.73	32	159		
21-Jul-2012	19:24:08	116	TB_36			Camera	33	445945	6105990	445923	6106013	-21.74	23.45	32	137		
21-Jul-2012	19:25:12	117	TB_36			Camera	32	445946	6105997	445923	6106013	-22.81	15.99	28	125		
21-Jul-2012	19:26:45	118	TB_36			Camera	33	445946	6106008	445923	6106013	-22.88	5.45	24	103		
21-Jul-2012	19:27:53	119	TB_36			Camera	33	445939	6106013	445923	6106013	-16.10	-0.32	16	89		
21-Jul-2012	19:29:04	120	TB_36			Camera	32	445926	6106021	445923	6106013	-2.58	-8.32	9	17		
21-Jul-2012	19:29:46	121	TB_36			Camera	32	445920	6106022	445923	6106013	3.25	-9.10	10	340		
21-Jul-2012	19:31:23	122	TB_36			Camera	32	445928	6106024	445923	6106013	-5.38	-10.52	12	27		
21-Jul-2012	19:33:07	123	TB_36			Camera	33	445931	6106035	445923	6106013	-8.31	-21.54	23	21		
21-Jul-2012	19:34:14	124	TB_36			Camera	32	445929	6106043	445923	6106013	-5.75	-29.65	30	11		
21-Jul-2012	19:35:15	125	TB_36			Camera	32	445923	6106050	445923	6106013	-0.43	-36.65	37	1		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
21-Jul-2012	19:36:14	126	TB_36			Camera	33	445920	6106057	445923	6106013	2.75	-44.18	44	356		
21-Jul-2012	20:19:22	127	TB_34			Camera	33	447665	6106874	447675	6106904	9.67	30.01	32	198		
21-Jul-2012	20:20:09	128	TB_34			Camera	33	447673	6106881	447675	6106904	1.89	23.42	24	185		
21-Jul-2012	20:20:50	129	TB_34			Camera	33	447676	6106884	447675	6106904	-1.30	19.91	20	176		
21-Jul-2012	20:21:36	130	TB_34			Camera	33	447682	6106889	447675	6106904	-7.16	15.27	17	155		
21-Jul-2012	20:22:41	131	TB_34			Camera	33	447683	6106889	447675	6106904	-8.04	14.94	17	152		
21-Jul-2012	20:24:00	132	TB_34			Camera	29	447680	6106885	447675	6106904	-4.81	19.37	20	166		
21-Jul-2012	20:24:13	133	TB_34			Camera	33	447680	6106885	447675	6106904	-4.66	19.45	20	167		
21-Jul-2012	20:25:01	134	TB_34			Camera	33	447693	6106890	447675	6106904	-18.04	14.04	23	128		
21-Jul-2012	20:26:08	135	TB_34			Camera	6	447681	6106892	447675	6106904	-6.42	12.25	14	152		
21-Jul-2012	20:26:54	136	TB_34			Camera	33	447672	6106897	447675	6106904	2.92	6.76	7	203		
21-Jul-2012	20:28:13	137	TB_34			Camera	33	447665	6106903	447675	6106904	9.77	1.23	10	263		
21-Jul-2012	20:29:51	138	TB_34			Camera	33	447682	6106922	447675	6106904	-6.92	-17.54	19	22		
21-Jul-2012	20:31:23	139	TB_34			Camera	33	447671	6106923	447675	6106904	4.24	-19.09	20	347		
21-Jul-2012	20:32:36	140	TB_34			Camera	33	447671	6106925	447675	6106904	4.24	-21.47	23	342		
22-Jul-2012	0:51:45	141	TB_38			Camera	31	453282	6105527	453305	6105519	22.68	-7.51	24	288		
22-Jul-2012	0:54:19	142	TB_38			Camera	31	453268	6105523	453305	6105519	37.41	-3.59	38	275		
22-Jul-2012	0:56:06	143	TB_38			Camera	30	453266	6105524	453305	6105519	38.51	-4.55	39	277		
22-Jul-2012	0:56:47	144	TB_38			Camera	31	453262	6105519	453305	6105519	43.36	0.17	43	270		
22-Jul-2012	0:58:27	145	TB_38			Camera	31	453264	6105513	453305	6105519	41.47	5.89	42	262		
22-Jul-2012	1:00:25	146	TB_38			Camera	31	453284	6105515	453305	6105519	21.32	3.81	22	260		
22-Jul-2012	1:01:11	147	TB_38			Camera	31	453279	6105507	453305	6105519	26.23	11.74	29	246		
22-Jul-2012	1:02:57	148	TB_38			Camera	30	453277	6105513	453305	6105519	28.22	5.67	29	259		
22-Jul-2012	1:05:04	149	TB_38			Camera	31	453277	6105510	453305	6105519	27.83	8.73	29	253		
22-Jul-2012	1:05:27	150	TB_38			Camera	30	453277	6105510	453305	6105519	27.76	8.62	29	253		
22-Jul-2012	1:08:10	151	TB_38			Camera	31	453285	6105519	453305	6105519	20.15	-0.16	20	270		
22-Jul-2012	1:09:26	152	TB_38			Camera	30	453293	6105512	453305	6105519	11.99	6.64	14	241		
22-Jul-2012	1:10:43	153	TB_38			Camera	31	453287	6105503	453305	6105519	18.16	15.77	24	229		
22-Jul-2012	1:47:23	154	TB_35			Camera	32	453295	6103786	453312	6103813	16.58	27.49	32	211		
22-Jul-2012	1:48:23	155	TB_35			Camera	31	453289	6103792	453312	6103813	23.20	21.48	32	227		
22-Jul-2012	1:50:06	156	TB_35			Camera	31	453283	6103805	453312	6103813	28.85	8.02	30	254		
22-Jul-2012	1:51:28	157	TB_35			Camera	31	453286	6103800	453312	6103813	25.53	13.01	29	243		
22-Jul-2012	1:52:33	158	TB_35			Camera	31	453291	6103806	453312	6103813	21.15	6.66	22	253		
22-Jul-2012	1:53:16	159	TB_35			Camera	31	453293	6103808	453312	6103813	19.47	5.49	20	254		
22-Jul-2012	1:53:47	160	TB_35			Camera	33	453295	6103807	453312	6103813	17.38	6.32	18	250		
22-Jul-2012	1:54:25	161	TB_35			Camera	31	453299	6103803	453312	6103813	13.20	10.03	17	233		
22-Jul-2012	1:54:45	162	TB_35			Camera	31	453300	6103801	453312	6103813	12.31	11.58	17	227		
22-Jul-2012	1:56:47	163	TB_35			Camera	31	453299	6103803	453312	6103813	13.36	10.19	17	233		
22-Jul-2012	1:58:00	164	TB_35			Camera	32	453303	6103811	453312	6103813	9.41	1.96	10	258		
22-Jul-2012	1:58:43	165	TB_35			Camera	31	453308	6103809	453312	6103813	3.76	3.98	5	223		
22-Jul-2012	1:59:59	166	TB_35			Camera	31	453316	6103802	453312	6103813	-3.82	10.77	11	161		
22-Jul-2012	2:35:39	167	TB_50			Camera	35	455800	6102515	455792	6102516	-7.65	0.81	8	96		
22-Jul-2012	2:36:53	168	TB_50			Camera	35	455809	6102517	455792	6102516	-16.64	-1.28	17	86		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
22-Jul-2012	2:38:16	169	TB_50			Camera	35	455811	6102508	455792	6102516	-19.18	8.08	21	113		
22-Jul-2012	2:40:44	170	TB_50			Camera	35	455814	6102497	455792	6102516	-21.68	19.34	29	132		
22-Jul-2012	2:42:00	171	TB_50			Camera	35	455817	6102510	455792	6102516	-25.14	5.65	26	103		
22-Jul-2012	2:43:38	172	TB_50			Camera	35	455811	6102513	455792	6102516	-19.32	2.90	20	99		
22-Jul-2012	2:45:28	173	TB_50			Camera	35	455817	6102508	455792	6102516	-24.53	8.07	26	108		
22-Jul-2012	2:48:44	174	TB_50			Camera	35	455805	6102512	455792	6102516	-13.24	4.05	14	107		
22-Jul-2012	2:50:17	175	TB_50			Camera	35	455805	6102504	455792	6102516	-12.56	11.73	17	133		
22-Jul-2012	3:34:29	176	TB_44			Camera	34	459525	6103706	459561	6103703	36.22	-3.49	36	276		
22-Jul-2012	3:37:13	177	TB_44			Camera	34	459524	6103701	459561	6103703	37.07	2.34	37	266		
22-Jul-2012	3:38:57	178	TB_44			Camera	34	459522	6103707	459561	6103703	39.40	-4.44	40	276		
22-Jul-2012	3:42:09	179	TB_44			Camera	34	459530	6103701	459561	6103703	31.44	1.97	32	266		
22-Jul-2012	3:44:49	180	TB_44			Camera	34	459530	6103692	459561	6103703	31.12	10.73	33	251		
22-Jul-2012	3:47:21	181	TB_44			Camera	34	459534	6103690	459561	6103703	26.98	13.35	30	244		
22-Jul-2012	3:48:41	182	TB_44			Camera	34	459540	6103687	459561	6103703	20.84	15.84	26	233		
22-Jul-2012	3:52:30	183	TB_44			Camera	34	459563	6103683	459561	6103703	-2.06	20.21	20	174		
22-Jul-2012	3:53:24	184	TB_44			Camera	34	459566	6103684	459561	6103703	-5.43	19.23	20	164		
22-Jul-2012	3:54:13	185	TB_44			Camera	34	459566	6103686	459561	6103703	-4.89	17.35	18	164		
22-Jul-2012	3:56:15	186	TB_44			Camera	34	459556	6103702	459561	6103703	4.95	0.96	5	259		
22-Jul-2012	4:18:07	187	TB_49			Camera	34	459941	6104477	459954	6104479	12.95	2.41	13	259		
22-Jul-2012	4:18:53	188	TB_49			Camera	35	459944	6104474	459954	6104479	9.70	4.88	11	243		
22-Jul-2012	4:19:34	189	TB_49			Camera	35	459946	6104475	459954	6104479	8.40	3.58	9	247		
22-Jul-2012	4:19:43	190	TB_49			Camera	34	459946	6104475	459954	6104479	8.34	3.72	9	246		
22-Jul-2012	4:20:19	191	TB_49			Camera	34	459947	6104474	459954	6104479	6.89	4.75	8	235		
22-Jul-2012	4:20:34	192	TB_49			Camera	34	459948	6104474	459954	6104479	6.24	4.72	8	233		
22-Jul-2012	4:22:17	193	TB_49			Camera	36	459955	6104467	459954	6104479	-0.90	12.22	12	176		
22-Jul-2012	4:22:54	194	TB_49			Camera	34	459960	6104463	459954	6104479	-5.82	16.14	17	160		
22-Jul-2012	4:24:09	195	TB_49			Camera	34	459957	6104462	459954	6104479	-2.94	16.53	17	170		
22-Jul-2012	4:24:41	196	TB_49			Camera	34	459954	6104467	459954	6104479	-0.28	11.93	12	179		
22-Jul-2012	4:24:52	197	TB_49			Camera	34	459954	6104466	459954	6104479	-0.05	12.61	13	180		
22-Jul-2012	4:26:14	198	TB_49			Camera	34	459954	6104478	459954	6104479	-0.33	0.56	1	149		
22-Jul-2012	4:27:24	199	TB_49			Camera	34	459952	6104483	459954	6104479	2.44	-3.51	4	325		
22-Jul-2012	4:28:24	200	TB_49			Camera	34	459952	6104483	459954	6104479	2.44	-4.18	7	305		
22-Jul-2012	4:28:34	201	TB_49			Camera	34	459949	6104483	459954	6104479	5.11	-4.08	7	309		
22-Jul-2012	4:29:55	202	TB_49			Camera	35	459954	6104482	459954	6104479	0.29	-2.93	3	354		
22-Jul-2012	4:54:52	203	TB_53			Camera	38	459298	6105717	459308	6105741	10.34	23.62	26	204		
22-Jul-2012	4:56:26	204	TB_53			Camera	38	459305	6105721	459308	6105741	2.61	20.31	20	187		
22-Jul-2012	4:58:20	205	TB_53			Camera	38	459314	6105723	459308	6105741	-6.23	18.25	19	161		
22-Jul-2012	4:59:26	206	TB_53			Camera	38	459322	6105727	459308	6105741	-14.11	14.44	20	136		
22-Jul-2012	5:00:41	207	TB_53			Camera	38	459327	6105732	459308	6105741	-18.71	9.28	21	116		
22-Jul-2012	5:02:52	208	TB_53			Camera	38	459317	6105739	459308	6105741	-8.66	1.61	9	101		
22-Jul-2012	5:04:02	209	TB_53			Camera	38	459298	6105740	459308	6105741	9.60	0.71	10	266		
22-Jul-2012	5:05:54	210	TB_53			Camera	38	459304	6105733	459308	6105741	3.58	7.61	8	205		
22-Jul-2012	5:07:15	211	TB_53			Camera	35	459312	6105732	459308	6105741	-4.09	9.17	10	156		

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Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
22-Jul-2012	5:08:28	212	TB_53			Camera	38	459317	6105729	459308	6105741	-8.69	12.24	15	145		
22-Jul-2012	5:09:09	213	TB_53			Camera	38	459312	6105734	459308	6105741	-4.16	7.49	9	151		
22-Jul-2012	5:10:52	214	TB_53			Camera	38	459310	6105737	459308	6105741	-2.12	4.29	5	154		
22-Jul-2012	5:12:41	215	TB_53			Camera	38	459323	6105744	459308	6105741	-14.60	-3.16	15	78		
22-Jul-2012	5:14:41	216	TB_53			Camera	38	459323	6105748	459308	6105741	-14.60	-6.68	34	79		
22-Jul-2012	5:37:29	217	TB_52			Camera	38	459072	6106394	459048	6106393	-23.54	-0.62	24	89		
22-Jul-2012	5:38:53	218	TB_52			Camera	37	459081	6106401	459048	6106393	-33.38	-8.33	34	76		
22-Jul-2012	5:50:51	219	TB_52			Camera	38	459095	6106384	459048	6106393	-47.49	9.12	48	101		
22-Jul-2012	5:51:38	220	TB_52			Camera	38	459100	6106385	459048	6106393	-51.94	8.43	53	99		
22-Jul-2012	5:53:39	221	TB_52			Camera	40	459090	6106383	459048	6106393	-42.02	9.66	43	103		
22-Jul-2012	5:54:37	222	TB_52			Camera	38	459080	6106381	459048	6106393	-31.90	12.00	34	111		
22-Jul-2012	5:55:44	223	TB_52			Camera	39	459076	6106381	459048	6106393	-27.73	11.52	30	113		
22-Jul-2012	11:52:27	224	TB_40			Camera	33	463398	6107104	463424	6107105	26.39	1.04	26	268		
22-Jul-2012	11:53:40	225	TB_40			Camera	33	463379	6107108	463424	6107105	44.51	-2.55	45	273		
22-Jul-2012	11:53:56	226	TB_40			Camera	33	463383	6107106	463424	6107105	40.81	-1.44	41	272		
22-Jul-2012	11:55:32	227	TB_40			Camera	32	463391	6107100	463424	6107105	32.82	5.41	33	261		
22-Jul-2012	11:56:44	228	TB_40			Camera	32	463404	6107108	463424	6107105	19.73	-2.78	20	278		
22-Jul-2012	11:57:55	229	TB_40			Camera	32	463416	6107121	463424	6107105	7.70	-15.50	17	334		
22-Jul-2012	11:59:56	230	TB_40			Camera	32	463417	6107126	463424	6107105	7.18	-20.78	22	341		
22-Jul-2012	12:00:52	231	TB_40			Camera	32	463410	6107125	463424	6107105	13.86	-20.27	25	326		
22-Jul-2012	12:02:11	232	TB_40			Camera	33	463396	6107135	463424	6107105	27.99	-30.17	41	317		
22-Jul-2012	12:02:26	233	TB_40			Camera	29	463396	6107136	463424	6107105	27.62	-30.62	41	318		
22-Jul-2012	12:03:53	234	TB_40			Camera	32	463393	6107139	463424	6107105	31.01	-34.40	46	318		
22-Jul-2012	12:29:42	235	TB_51			Camera	36	464253	6108870	464243	6108856	-9.57	-13.78	17	35		
22-Jul-2012	12:30:12	236	TB_51			Camera	36	464249	6108874	464243	6108856	-5.75	-17.54	18	18		
22-Jul-2012	12:30:54	237	TB_51			Camera	36	464245	6108883	464243	6108856	-2.10	-26.59	27	5		
22-Jul-2012	12:31:33	238	TB_51			Camera	36	464240	6108893	464243	6108856	2.79	-37.08	37	356		
22-Jul-2012	12:32:04	239	TB_51			Camera	36	464234	6108897	464243	6108856	8.63	-40.50	41	348		
22-Jul-2012	12:36:34	240	TB_51			Camera	36	464201	6108881	464243	6108856	41.78	-24.65	49	301		
22-Jul-2012	12:38:36	241	TB_51			Camera	36	464211	6108889	464243	6108856	31.78	-32.96	46	316		
22-Jul-2012	12:39:30	242	TB_51			Camera	36	464211	6108882	464243	6108856	32.39	-25.88	41	309		
22-Jul-2012	12:40:18	243	TB_51			Camera	36	464211	6108878	464243	6108856	32.19	-22.23	39	305		
22-Jul-2012	12:41:08	244	TB_51			Camera	36	464215	6108870	464243	6108856	27.59	-14.13	31	297		
22-Jul-2012	12:41:57	245	TB_51			Camera	36	464218	6108862	464243	6108856	24.61	-5.85	25	283		
22-Jul-2012	12:42:54	246	TB_51			Camera	36	464224	6108861	464243	6108856	19.37	-5.34	20	285		
22-Jul-2012	13:33:34	247	TB_54			Camera	37	466238	6109737	466243	6109704	5.47	-32.51	33	350		
22-Jul-2012	13:35:06	248	TB_54			Camera	37	466215	6109735	466243	6109704	27.93	-30.86	42	318		
22-Jul-2012	13:36:27	249	TB_54			Camera	37	466208	6109726	466243	6109704	35.41	-21.64	42	301		
22-Jul-2012	13:37:22	250	TB_54			Camera	37	466209	6109720	466243	6109704	33.56	-15.98	37	295		
22-Jul-2012	13:38:37	251	TB_54			Camera	37	466220	6109716	466243	6109704	22.68	-11.57	25	297		
22-Jul-2012	13:38:46	252	TB_54			Camera	39	466220	6109715	466243	6109704	22.63	-11.29	25	297		
22-Jul-2012	13:40:14	253	TB_54			Camera	37	466232	6109718	466243	6109704	10.64	-14.03	18	323		
22-Jul-2012	13:41:31	254	TB_54			Camera	37	466241	6109717	466243	6109704	1.90	-13.40	14	352		

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Tranche B

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Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
22-Jul-2012	13:43:11	255	TB_54			Camera	37	466246	6109711	466243	6109704	-2.63	-7.22	8	20		
22-Jul-2012	13:44:30	256	TB_54			Camera	37	466252	6109703	466243	6109704	-8.89	0.79	9	95		
22-Jul-2012	13:44:38	257	TB_54			Camera	37	466250	6109703	466243	6109704	-7.29	1.20	7	99		
22-Jul-2012	13:46:05	258	TB_54			Camera	37	466250	6109708	466243	6109704	-6.66	-4.14	8	58		
22-Jul-2012	13:47:00	259	TB_54			Camera	37	466250	6109710	466243	6109704	-6.66	-6.17	6	8		
22-Jul-2012	13:47:58	260	TB_54			Camera	37	466238	6109709	466243	6109704	4.73	-5.24	7	318		
22-Jul-2012	13:48:08	261	TB_54			Camera	37	466239	6109710	466243	6109704	4.44	-6.07	8	324		
22-Jul-2012	13:50:15	262	TB_54			Camera	37	466214	6109704	466243	6109704	29.18	0.34	29	269		
22-Jul-2012	13:51:47	263	TB_54			Camera	37	466218	6109710	466243	6109704	25.26	-5.82	26	283		
22-Jul-2012	13:52:02	264	TB_54			Camera	38	466218	6109710	466243	6109704	24.72	-5.94	25	284		
22-Jul-2012	13:53:16	265	TB_54			Camera	37	466233	6109707	466243	6109704	10.06	-3.21	11	288		
22-Jul-2012	13:53:26	266	TB_54			Camera	37	466233	6109707	466243	6109704	10.06	-2.61	11	283		
22-Jul-2012	13:54:48	267	TB_54			Camera	37	466242	6109703	466243	6109704	1.49	1.39	2	227		
22-Jul-2012	13:55:57	268	TB_54			Camera	37	466253	6109712	466243	6109704	-9.94	-8.06	13	51		
22-Jul-2012	13:57:32	269	TB_54			Camera	37	466253	6109717	466243	6109704	-9.91	-12.61	16	38		
22-Jul-2012	13:57:42	270	TB_54			Camera	37	466254	6109712	466243	6109704	-11.32	-8.42	14	53		
23-Jul-2012	20:18:25	271	TB_43			Camera	35	466814	6106956	466790	6106978	-23.95	21.90	32	132		
23-Jul-2012	20:19:25	272	TB_43			Camera	36	466814	6106956	466790	6106978	-24.35	21.99	33	132		
23-Jul-2012	20:20:50	273	TB_43			Camera	36	466809	6106954	466790	6106978	-18.84	24.33	31	142		
23-Jul-2012	20:21:54	274	TB_43			Camera	35	466814	6106963	466790	6106978	-24.41	15.16	29	122		
23-Jul-2012	20:23:00	275	TB_43			Camera	35	466810	6106958	466790	6106978	-20.31	20.11	29	135		
23-Jul-2012	20:24:42	276	TB_43			Camera	32	466810	6106951	466790	6106978	-19.55	27.50	34	145		
23-Jul-2012	20:26:12	277	TB_43			Camera	35	466813	6106948	466790	6106978	-23.09	29.59	38	142		
23-Jul-2012	20:27:34	278	TB_43			Camera	36	466804	6106931	466790	6106978	-13.93	46.57	49	163		
23-Jul-2012	20:28:47	279	TB_43			Camera	36	466805	6106932	466790	6106978	-14.88	46.05	48	162		
23-Jul-2012	20:29:43	280	TB_43			Camera	35	466805	6106938	466790	6106978	-15.22	40.34	43	159		
23-Jul-2012	22:10:33	281	TB_45			Camera	33	465449	6104651	465452	6104648	2.97	-3.24	4	318		
23-Jul-2012	22:12:10	282	TB_45			Camera	33	465491	6104665	465452	6104648	-39.02	-16.75	42	67		
23-Jul-2012	22:13:11	283	TB_45			Camera	28	465470	6104609	465452	6104648	-18.39	38.71	43	155		
23-Jul-2012	22:14:34	284	TB_45			Camera	4	465486	6104620	465452	6104648	-33.95	28.25	44	130		
23-Jul-2012	22:16:16	285	TB_45			Camera	32	465473	6104604	465452	6104648	-21.47	43.55	49	154		
23-Jul-2012	22:17:01	286	TB_45			Camera	29	465470	6104606	465452	6104648	-17.86	42.50	46	157		
23-Jul-2012	22:18:23	287	TB_45			Camera	32	465465	6104605	465452	6104648	-12.85	42.68	45	163		
23-Jul-2012	22:19:16	288	TB_45			Camera	33	465458	6104608	465452	6104648	-6.38	39.52	40	171		
23-Jul-2012	22:20:46	289	TB_45			Camera	32	465455	6104614	465452	6104648	-2.51	33.87	34	176		
23-Jul-2012	22:21:59	290	TB_45			Camera	33	465450	6104621	465452	6104648	1.74	26.77	27	184		
23-Jul-2012	22:23:02	291	TB_45			Camera	33	465447	6104627	465452	6104648	5.23	21.04	22	194		
24-Jul-2012	1:51:23	292	TB_47			Camera	33	466478	6105364	466494	6105342	16.28	-21.52	27	323		
24-Jul-2012	1:53:16	293	TB_47			Camera	32	466478	6105347	466494	6105342	15.96	-4.52	17	286		
24-Jul-2012	1:55:18	294	TB_47			Camera	33	466483	6105343	466494	6105342	10.67	-0.62	11	273		
24-Jul-2012	1:57:08	295	TB_47			Camera	33	466489	6105336	466494	6105342	5.43	6.41	8	220		
24-Jul-2012	1:57:58	296	TB_47			Camera	32	466486	6105329	466494	6105342	7.85	13.10	15	211		
24-Jul-2012	2:01:54	297	TB_47			Camera	32	466478	6105327	466494	6105342	15.64	15.06	22	226		

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								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
24-Jul-2012	2:02:07	298	TB_47			Camera	32	466478	6105328	466494	6105342	15.62	14.31	21	227		
24-Jul-2012	2:05:01	299	TB_47			Camera	32	466472	6105314	466494	6105342	21.83	28.15	36	218		
24-Jul-2012	2:10:49	300	TB_47			Camera	33	466498	6105327	466494	6105342	-3.69	14.81	15	166		
24-Jul-2012	2:16:15	301	TB_47			Camera	33	466529	6105341	466494	6105342	-34.96	0.66	35	91		
24-Jul-2012	3:30:37	302	TB_37			Camera	30	473879	6110701	473889	6110686	10.34	-14.98	18	325		
24-Jul-2012	3:33:29	303	TB_37			Camera	31	473878	6110699	473889	6110686	10.87	-12.55	17	319		
24-Jul-2012	3:35:13	304	TB_37			Camera	32	473876	6110698	473889	6110686	12.76	-11.62	17	312		
24-Jul-2012	3:35:48	305	TB_37			Camera	31	473876	6110698	473889	6110686	13.25	-11.50	18	311		
24-Jul-2012	3:35:59	306	TB_37			Camera	30	473876	6110698	473889	6110686	13.16	-11.66	18	312		
24-Jul-2012	3:38:08	307	TB_37			Camera	31	473871	6110703	473889	6110686	17.67	-16.78	24	314		
24-Jul-2012	3:40:33	308	TB_37			Camera	31	473877	6110692	473889	6110686	11.76	-5.72	13	296		
24-Jul-2012	3:43:07	309	TB_37			Camera	31	473878	6110693	473889	6110686	10.63	-7.22	13	304		
24-Jul-2012	3:45:22	310	TB_37			Camera	31	473883	6110690	473889	6110686	6.47	-4.13	8	303		
24-Jul-2012	3:47:13	311	TB_37			Camera	31	473880	6110701	473889	6110686	8.51	-14.56	17	330		
24-Jul-2012	5:04:39	312	TB_20			Camera	27	478595	6104437	478617	6104418	22.30	-19.39	30	311		
24-Jul-2012	5:06:42	313	TB_20			Camera	28	478605	6104430	478617	6104418	12.13	-12.08	17	315		
24-Jul-2012	5:08:13	314	TB_20			Camera	28	478604	6104433	478617	6104418	13.01	-14.70	20	318		
24-Jul-2012	5:10:19	315	TB_20			Camera	28	478608	6104432	478617	6104418	8.81	-14.26	17	328		
24-Jul-2012	5:11:49	316	TB_20			Camera	28	478613	6104425	478617	6104418	4.36	-7.35	9	329		
24-Jul-2012	5:13:06	317	TB_20			Camera	27	478608	6104434	478617	6104418	9.17	-16.16	19	330		
24-Jul-2012	5:14:49	318	TB_20			Camera	28	478616	6104424	478617	6104418	1.36	-5.75	6	347		
24-Jul-2012	5:16:29	319	TB_20			Camera	27	478612	6104429	478617	6104418	5.01	-11.17	12	336		
24-Jul-2012	5:17:12	320	TB_20			Camera	28	478613	6104428	478617	6104418	3.96	-9.72	11	338		
24-Jul-2012	5:17:24	321	TB_20			Camera	27	478613	6104428	478617	6104418	3.98	-9.83	11	338		
24-Jul-2012	5:19:37	322	TB_20			Camera	27	478614	6104423	478617	6104418	2.75	-4.96	6	331		
24-Jul-2012	6:25:41	323	TB_13			Camera	27	481926	6110321	481909	6110323	-16.86	2.20	17	97		
24-Jul-2012	6:27:19	324	TB_13			Camera	27	481928	6110314	481909	6110323	-18.54	9.20	21	116		
24-Jul-2012	6:29:29	325	TB_13			Camera	27	481934	6110308	481909	6110323	-25.09	14.68	29	120		
24-Jul-2012	6:31:19	326	TB_13			Camera	27	481932	6110317	481909	6110323	-23.42	6.24	24	105		
24-Jul-2012	6:33:31	327	TB_13			Camera	28	481925	6110327	481909	6110323	-16.02	-4.36	17	75		
24-Jul-2012	6:35:18	328	TB_13			Camera	27	481928	6110337	481909	6110323	-19.01	-14.46	24	53		
24-Jul-2012	6:37:09	329	TB_13			Camera	27	481921	6110344	481909	6110323	-12.42	-21.15	25	30		
24-Jul-2012	6:38:52	330	TB_13			Camera	27	481916	6110343	481909	6110323	-6.72	-19.95	21	19		
24-Jul-2012	6:40:17	331	TB_13			Camera	27	481915	6110345	481909	6110323	-5.84	-21.85	23	15		
24-Jul-2012	8:04:28	332	TB_1			Camera	26	484396	6103117	484374	6103128	-22.38	11.04	25	116		
24-Jul-2012	8:05:47	333	TB_1			Camera	26	484385	6103121	484374	6103128	-11.03	6.76	13	122		
24-Jul-2012	8:07:35	334	TB_1			Camera	26	484367	6103126	484374	6103128	6.65	1.83	7	255		
24-Jul-2012	8:08:52	335	TB_1			Camera	26	484352	6103128	484374	6103128	21.64	-0.19	22	271		
24-Jul-2012	8:10:35	336	TB_1			Camera	26	484326	6103133	484374	6103128	48.25	-4.65	48	276		
24-Jul-2012	8:14:20	337	TB_1			Camera	26	484412	6103139	484374	6103128	-38.02	-11.29	40	73		
24-Jul-2012	8:15:25	338	TB_1			Camera	26	484425	6103139	484374	6103128	-50.56	-10.98	52	78		
24-Jul-2012	8:16:27	339	TB_1			Camera	28	484429	6103135	484374	6103128	-54.88	-7.01	55	83		
24-Jul-2012	8:17:19	340	TB_1			Camera	26	484425	6103129	484374	6103128	-51.44	-1.02	51	89		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
24-Jul-2012	8:19:59	341	TB_1			Camera	26	484398	6103116	484374	6103128	-24.06	12.40	27	117		
24-Jul-2012	8:21:58	342	TB_1			Camera	27	484393	6103118	484374	6103128	-19.41	9.92	22	117		
24-Jul-2012	8:54:16	343	TB_5			Camera	26	483531	6101859	483484	6101847	-47.18	-11.85	49	76		
24-Jul-2012	8:56:29	344	TB_5			Camera	26	483516	6101829	483484	6101847	-31.59	17.58	36	119		
24-Jul-2012	8:59:06	345	TB_5			Camera	26	483492	6101809	483484	6101847	-8.21	38.47	39	168		
24-Jul-2012	9:02:25	346	TB_5			Camera	25	483479	6101805	483484	6101847	4.89	41.66	42	187		
24-Jul-2012	9:03:48	347	TB_5			Camera	25	483482	6101810	483484	6101847	2.07	36.82	37	183		
24-Jul-2012	9:05:41	348	TB_5			Camera	25	483475	6101817	483484	6101847	9.01	30.44	32	196		
24-Jul-2012	9:08:22	349	TB_5			Camera	26	483481	6101830	483484	6101847	2.81	16.81	17	189		
24-Jul-2012	9:10:19	350	TB_5			Camera	26	483487	6101839	483484	6101847	-3.03	7.64	8	158		
24-Jul-2012	10:54:34	351	TB_8			Camera	25	489466	6105954	489400	6105950	-65.98	-3.50	66	87		
24-Jul-2012	10:57:11	352	TB_8			Camera	25	489441	6105929	489400	6105950	-41.06	20.86	46	117		
24-Jul-2012	10:59:16	353	TB_8			Camera	25	489426	6105914	489400	6105950	-26.09	36.29	45	144		
24-Jul-2012	11:01:35	354	TB_8			Camera	25	489411	6105909	489400	6105950	-10.51	40.51	42	165		
24-Jul-2012	11:01:47	355	TB_8			Camera	26	489410	6105910	489400	6105950	-10.12	40.27	42	166		
24-Jul-2012	11:04:32	356	TB_8			Camera	25	489409	6105921	489400	6105950	-9.06	29.12	31	163		
24-Jul-2012	11:05:59	357	TB_8			Camera	27	489393	6105921	489400	6105950	7.05	28.70	30	194		
24-Jul-2012	11:07:16	358	TB_8			Camera	27	489393	6105929	489400	6105950	6.59	21.33	22	197		
24-Jul-2012	11:08:21	359	TB_8			Camera	26	489396	6105936	489400	6105950	3.97	13.74	14	196		
24-Jul-2012	11:09:24	360	TB_8			Camera	25	489392	6105946	489400	6105950	8.46	3.72	9	246		
24-Jul-2012	11:10:25	361	TB_8			Camera	25	489389	6105953	489400	6105950	10.63	-2.59	11	284		
24-Jul-2012	11:10:34	362	TB_8			Camera	25	489390	6105952	489400	6105950	10.31	-2.46	11	283		
24-Jul-2012	11:38:19	363	TB_27			Camera	28	490596	6106559	490582	6106559	-14.10	0.42	14	92		
24-Jul-2012	11:38:59	364	TB_27			Camera	30	490599	6106562	490582	6106559	-17.24	-2.95	17	80		
24-Jul-2012	11:39:54	365	TB_27			Camera	28	490606	6106566	490582	6106559	-24.24	-7.43	25	73		
24-Jul-2012	11:40:57	366	TB_27			Camera	28	490606	6106565	490582	6106559	-24.18	-6.22	25	76		
24-Jul-2012	11:41:42	367	TB_27			Camera	28	490607	6106563	490582	6106559	-24.60	-4.49	25	80		
24-Jul-2012	11:42:45	368	TB_27			Camera	28	490608	6106564	490582	6106559	-25.92	-5.34	26	78		
24-Jul-2012	11:44:03	369	TB_27			Camera	28	490600	6106557	490582	6106559	-18.21	2.47	18	98		
24-Jul-2012	11:45:36	370	TB_27			Camera	28	490604	6106568	490582	6106559	-22.11	-9.22	24	67		
24-Jul-2012	11:50:09	371	TB_27			Camera	28	490589	6106595	490582	6106559	-6.96	-35.76	36	11		
24-Jul-2012	11:51:10	372	TB_27			Camera	28	490580	6106599	490582	6106559	1.63	-40.17	40	358		
24-Jul-2012	11:53:04	373	TB_27			Camera	29	490559	6106605	490582	6106559	23.27	-46.48	52	333		
24-Jul-2012	11:54:53	374	TB_27			Camera	29	490546	6106614	490582	6106559	36.37	-54.79	66	326		
24-Jul-2012	11:56:37	375	TB_27			Camera	28	490545	6106632	490582	6106559	37.48	-73.12	82	333		
24-Jul-2012	11:58:20	376	TB_27			Camera	30	490534	6106634	490582	6106559	47.56	-74.86	89	328		
24-Jul-2012	11:59:33	377	TB_27			Camera	29	490518	6106623	490582	6106559	63.53	-63.51	90	315		
24-Jul-2012	12:01:10	378	TB_27			Camera	29	490507	6106627	490582	6106559	74.93	-68.10	101	312		
24-Jul-2012	12:35:45	379	TB_29			Camera	28	489698	6109629	489680	6109613	-17.82	-15.80	24	48		
24-Jul-2012	12:37:14	380	TB_29			Camera	28	489704	6109609	489680	6109613	-24.10	3.78	24	99		
24-Jul-2012	12:38:15	381	TB_29			Camera	28	489707	6109593	489680	6109613	-26.71	20.37	34	127		
24-Jul-2012	12:39:09	382	TB_29			Camera	29	489706	6109600	489680	6109613	-26.35	13.13	29	116		
24-Jul-2012	12:40:14	383	TB_29			Camera	28	489707	6109619	489680	6109613	-27.18	-6.00	28	78		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
24-Jul-2012	12:41:21	384	TB_29			Camera	28	489699	6109631	489680	6109613	-19.42	-18.09	27	47		
24-Jul-2012	12:42:16	385	TB_29			Camera	28	489691	6109643	489680	6109613	-11.16	-30.43	32	20		
24-Jul-2012	12:43:21	386	TB_29			Camera	29	489690	6109646	489680	6109613	-9.62	-33.46	35	16		
24-Jul-2012	12:44:27	387	TB_29			Camera	29	489692	6109647	489680	6109613	-11.78	-33.67	36	19		
24-Jul-2012	12:45:18	388	TB_29			Camera	28	489688	6109644	489680	6109613	-8.45	-30.91	32	15		
24-Jul-2012	13:25:23	389	TB_14			Camera	29	493216	6110119	493195	6110105	-21.20	-14.10	25	56		
24-Jul-2012	13:26:32	390	TB_14			Camera	29	493198	6110101	493195	6110105	-2.62	3.81	5	145		
24-Jul-2012	13:28:00	391	TB_14			Camera	29	493194	6110108	493195	6110105	0.98	-2.94	3	342		
24-Jul-2012	13:29:05	392	TB_14			Camera	29	493193	6110121	493195	6110105	1.74	-16.17	16	354		
24-Jul-2012	13:30:08	393	TB_14			Camera	29	493189	6110126	493195	6110105	6.04	-21.39	22	344		
24-Jul-2012	13:31:00	394	TB_14			Camera	29	493188	6110134	493195	6110105	6.96	-29.33	30	347		
24-Jul-2012	13:31:56	395	TB_14			Camera	29	493183	6110117	493195	6110105	11.94	-12.33	17	316		
24-Jul-2012	16:39:34	396	TB_24			Camera	29	498734	6112495	498748	6112490	13.58	-4.74	14	289		
24-Jul-2012	16:40:27	397	TB_24			Camera	29	498733	6112498	498748	6112490	14.63	-7.87	17	298		
24-Jul-2012	16:41:29	398	TB_24			Camera	28	498735	6112491	498748	6112490	12.71	-0.78	13	274		
24-Jul-2012	16:42:23	399	TB_24			Camera	29	498733	6112487	498748	6112490	15.29	3.34	16	258		
24-Jul-2012	16:43:06	400	TB_24			Camera	28	498731	6112486	498748	6112490	17.28	4.23	18	256		
24-Jul-2012	16:44:16	401	TB_24			Camera	29	498728	6112489	498748	6112490	19.83	0.93	20	267		
24-Jul-2012	16:45:14	402	TB_24			Camera	29	498731	6112489	498748	6112490	17.04	0.66	17	268		
24-Jul-2012	16:46:08	403	TB_24			Camera	29	498729	6112495	498748	6112490	18.57	-4.96	19	285		
24-Jul-2012	16:47:03	404	TB_24			Camera	28	498730	6112500	498748	6112490	18.36	-10.42	21	300		
24-Jul-2012	16:48:00	405	TB_24			Camera	29	498733	6112502	498748	6112490	15.46	-11.97	20	308		
24-Jul-2012	17:43:02	406	TB_15			Camera	28	503381	6110814	503391	6110814	9.69	0.18	10	269		
24-Jul-2012	17:43:47	407	TB_15			Camera	28	503384	6110810	503391	6110814	7.48	3.93	8	242		
24-Jul-2012	17:45:01	408	TB_15			Camera	28	503382	6110810	503391	6110814	8.57	4.15	10	244		
24-Jul-2012	17:45:40	409	TB_15			Camera	28	503381	6110813	503391	6110814	9.88	1.17	10	263		
24-Jul-2012	17:46:17	410	TB_15			Camera	28	503382	6110814	503391	6110814	9.30	-0.05	9	270		
24-Jul-2012	17:47:21	411	TB_15			Camera	28	503378	6110820	503391	6110814	12.58	-5.91	14	295		
24-Jul-2012	17:47:44	412	TB_15			Camera	28	503379	6110820	503391	6110814	12.20	-5.71	13	295		
24-Jul-2012	17:48:58	413	TB_15			Camera	28	503378	6110828	503391	6110814	13.09	-14.04	19	317		
24-Jul-2012	17:50:00	414	TB_15			Camera	28	503381	6110831	503391	6110814	10.36	-16.81	20	328		
24-Jul-2012	17:50:54	415	TB_15			Camera	28	503380	6110828	503391	6110814	10.72	-13.82	17	322		
24-Jul-2012	18:23:51	416	TB_19			Camera	27	500649	6109648	500638	6109644	-11.22	-3.70	12	72		
24-Jul-2012	18:24:34	417	TB_19			Camera	27	500655	6109650	500638	6109644	-17.22	-5.86	18	71		
24-Jul-2012	18:25:23	418	TB_19			Camera	27	500658	6109654	500638	6109644	-20.27	-9.52	22	65		
24-Jul-2012	18:26:23	419	TB_19			Camera	27	500663	6109655	500638	6109644	-25.16	-10.95	27	66		
24-Jul-2012	18:26:32	420	TB_19			Camera	26	500663	6109656	500638	6109644	-25.12	-11.52	28	65		
24-Jul-2012	18:28:09	421	TB_19			Camera	27	500672	6109650	500638	6109644	-33.86	-6.22	34	80		
24-Jul-2012	18:29:30	422	TB_19			Camera	27	500672	6109638	500638	6109644	-34.48	6.44	35	101		
24-Jul-2012	18:30:42	423	TB_19			Camera	28	500672	6109631	500638	6109644	-33.69	12.67	36	111		
24-Jul-2012	18:32:01	424	TB_19			Camera	27	500671	6109633	500638	6109644	-32.86	11.39	35	109		
24-Jul-2012	21:49:06	425	TB_32			Camera	30	494740	6102920	494690	6102945	-49.80	24.79	56	116		
24-Jul-2012	21:50:15	426	TB_32			Camera	30	494701	6102931	494690	6102945	-10.60	13.69	17	142		

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Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
24-Jul-2012	21:51:29	427	TB_32			Camera	30	494690	6102934	494690	6102945	0.27	10.56	11	181		
24-Jul-2012	21:52:09	428	TB_32			Camera	29	494684	6102939	494690	6102945	5.86	5.73	8	226		
24-Jul-2012	21:52:59	429	TB_32			Camera	29	494678	6102940	494690	6102945	11.53	4.99	13	247		
24-Jul-2012	21:54:37	430	TB_32			Camera	29	494674	6102944	494690	6102945	16.43	0.76	16	267		
24-Jul-2012	21:56:30	431	TB_32			Camera	30	494704	6102952	494690	6102945	-14.32	-6.75	16	65		
24-Jul-2012	21:57:57	432	TB_32			Camera	30	494742	6102955	494690	6102945	-51.90	-10.31	53	79		
24-Jul-2012	21:58:41	433	TB_32			Camera	30	494767	6102955	494690	6102945	-77.03	-9.69	78	83		
24-Jul-2012	21:59:39	434	TB_32			Camera	30	494797	6102955	494690	6102945	-106.90	-9.71	107	85		
24-Jul-2012	22:00:56	435	TB_32			Camera	30	494835	6102954	494690	6102945	-145.18	-9.13	145	86		
24-Jul-2012	22:02:14	436	TB_32			Camera	29	494867	6102955	494690	6102945	-177.16	-10.05	177	87		
24-Jul-2012	23:48:39	437	TB_23			Camera	28	497551	6099567	497527	6099600	-23.92	32.67	40	144		
24-Jul-2012	23:50:50	438	TB_23			Camera	28	497549	6099556	497527	6099600	-22.15	44.31	50	153		
24-Jul-2012	23:53:30	439	TB_23			Camera	24	497567	6099569	497527	6099600	-40.35	31.33	51	128		
24-Jul-2012	23:53:49	440	TB_23			Camera	28	497566	6099571	497527	6099600	-39.01	28.83	49	126		
24-Jul-2012	23:54:10	441	TB_23			Camera	28	497567	6099571	497527	6099600	-39.68	29.29	49	126		
24-Jul-2012	23:55:06	442	TB_23			Camera	28	497562	6099577	497527	6099600	-34.80	23.47	42	124		
24-Jul-2012	23:55:44	443	TB_23			Camera	28	497557	6099581	497527	6099600	-29.95	19.24	36	123		
24-Jul-2012	23:56:35	444	TB_23			Camera	28	497555	6099584	497527	6099600	-27.53	16.41	32	121		
24-Jul-2012	23:57:15	445	TB_23			Camera	28	497551	6099586	497527	6099600	-24.17	13.51	28	119		
24-Jul-2012	23:59:01	446	TB_23			Camera	28	497546	6099589	497527	6099600	-18.81	10.99	22	120		
25-Jul-2012	0:00:15	447	TB_23			Camera	28	497538	6099591	497527	6099600	-10.79	9.35	14	131		
25-Jul-2012	0:00:50	448	TB_23			Camera	28	497534	6099590	497527	6099600	-7.31	9.65	12	143		
25-Jul-2012	0:01:21	449	TB_23			Camera	28	497530	6099591	497527	6099600	-2.83	9.38	10	163		
25-Jul-2012	1:10:38	450	TB_4			Camera	23	501121	6094739	501102	6094764	-18.86	25.10	31	143		
25-Jul-2012	1:11:46	451	TB_4			Camera	23	501119	6094753	501102	6094764	-16.80	10.76	20	123		
25-Jul-2012	1:13:04	452	TB_4			Camera	23	501127	6094758	501102	6094764	-24.62	6.39	25	105		
25-Jul-2012	1:14:13	453	TB_4			Camera	23	501135	6094750	501102	6094764	-32.83	14.42	36	114		
25-Jul-2012	1:15:15	454	TB_4			Camera	23	501132	6094748	501102	6094764	-29.57	15.90	34	118		
25-Jul-2012	1:16:30	455	TB_4			Camera	25	501132	6094770	501102	6094764	-30.34	-6.27	31	78		
25-Jul-2012	1:17:57	456	TB_4			Camera	23	501139	6094783	501102	6094764	-36.75	-18.70	41	63		
25-Jul-2012	1:18:48	457	TB_4			Camera	23	501140	6094785	501102	6094764	-37.55	-20.67	43	61		
25-Jul-2012	1:19:48	458	TB_4			Camera	23	501134	6094779	501102	6094764	-32.45	-15.25	36	65		
25-Jul-2012	2:12:20	459	TB_9			Camera	25	497176	6092455	497153	6092481	-23.35	26.41	35	139		
25-Jul-2012	2:13:32	460	TB_9			Camera	24	497165	6092459	497153	6092481	-11.62	21.65	25	152		
25-Jul-2012	2:14:47	461	TB_9			Camera	24	497154	6092457	497153	6092481	-0.78	23.51	24	178		
25-Jul-2012	2:16:51	462	TB_9			Camera	25	497139	6092462	497153	6092481	13.74	19.32	24	215		
25-Jul-2012	2:16:57	463	TB_9			Camera	25	497139	6092462	497153	6092481	14.08	19.31	24	216		
25-Jul-2012	2:17:52	464	TB_9			Camera	25	497132	6092471	497153	6092481	20.82	9.90	23	245		
25-Jul-2012	2:19:29	465	TB_9			Camera	25	497129	6092474	497153	6092481	23.61	6.61	25	254		
25-Jul-2012	2:20:15	466	TB_9			Camera	24	497127	6092477	497153	6092481	25.94	4.47	26	260		
25-Jul-2012	2:22:17	467	TB_9			Camera	25	497119	6092482	497153	6092481	34.10	-1.23	34	272		
25-Jul-2012	2:23:12	468	TB_9			Camera	27	497121	6092491	497153	6092481	32.18	-10.26	34	288		
25-Jul-2012	2:25:53	469	TB_9			Camera	25	497122	6092485	497153	6092481	30.69	-4.39	31	278		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
25-Jul-2012	2:27:10	470	TB_9			Camera	25	497123	6092488	497153	6092481	29.52	-7.05	30	283		
25-Jul-2012	2:29:27	471	TB_9			Camera	25	497129	6092498	497153	6092481	24.50	-17.02	30	305		
25-Jul-2012	2:29:40	472	TB_9			Camera	25	497129	6092498	497153	6092481	24.18	-17.46	30	306		
25-Jul-2012	3:38:23	473	TB_3			Camera	23	489729	6093212	489769	6093230	39.94	17.72	44	246		
25-Jul-2012	3:39:59	474	TB_3			Camera	23	489733	6093210	489769	6093230	36.31	19.97	41	241		
25-Jul-2012	3:41:41	475	TB_3			Camera	23	489736	6093211	489769	6093230	33.19	18.69	38	241		
25-Jul-2012	3:42:08	476	TB_3			Camera	23	489735	6093212	489769	6093230	34.18	18.11	39	242		
25-Jul-2012	3:46:04	477	TB_3			Camera	23	489762	6093259	489769	6093230	6.88	-29.29	30	347		
25-Jul-2012	3:49:18	478	TB_3			Camera	25	489775	6093245	489769	6093230	-5.76	-15.49	17	20		Beacon Position Error
25-Jul-2012	3:51:19	479	TB_3			Camera	23	489753	6093228	489769	6093230	15.82	2.50	16	261		
25-Jul-2012	3:51:43	480	TB_3			Camera	23	489751	6093226	489769	6093230	17.55	3.63	18	258		
25-Jul-2012	3:54:46	481	TB_3			Camera	23	489738	6093223	489769	6093230	31.07	6.82	32	258		
25-Jul-2012	3:57:16	482	TB_3			Camera	23	489766	6093233	489769	6093230	2.68	-3.14	4	319		
25-Jul-2012	4:56:23	483	TB_6			Camera	26	486752	6094305	486752	6094283	-0.09	-22.03	22	0		
25-Jul-2012	4:56:42	484	TB_6			Camera	24	486750	6094303	486752	6094283	1.77	-19.72	20	355		
25-Jul-2012	4:57:26	485	TB_6			Camera	24	486747	6094299	486752	6094283	4.74	-15.60	16	343		
25-Jul-2012	4:58:33	486	TB_6			Camera	26	486742	6094294	486752	6094283	9.93	-10.50	14	317		
25-Jul-2012	4:59:32	487	TB_6			Camera	24	486732	6094286	486752	6094283	20.05	-2.55	20	277		
25-Jul-2012	5:00:24	488	TB_6			Camera	24	486729	6094280	486752	6094283	22.86	2.81	23	263		
25-Jul-2012	5:01:09	489	TB_6			Camera	24	486730	6094277	486752	6094283	22.48	6.15	23	255		
25-Jul-2012	5:02:15	490	TB_6			Camera	24	486729	6094274	486752	6094283	22.80	9.04	25	248		
25-Jul-2012	5:03:54	491	TB_6			Camera	24	486733	6094277	486752	6094283	19.20	6.34	20	252		
25-Jul-2012	5:04:36	492	TB_6			Camera	24	486739	6094277	486752	6094283	12.54	5.77	14	245		
25-Jul-2012	5:06:01	493	TB_6			Camera	24	486763	6094280	486752	6094283	-10.56	3.38	11	108		
25-Jul-2012	5:07:12	494	TB_6			Camera	24	486772	6094280	486752	6094283	-19.73	2.98	20	99		
25-Jul-2012	5:08:00	495	TB_6			Camera	24	486762	6094278	486752	6094283	-9.93	4.94	11	116		
25-Jul-2012	5:08:19	496	TB_6			Camera	24	486758	6094278	486752	6094283	-6.34	5.46	8	131		
25-Jul-2012	6:24:23	497	TB_2			Camera	25	481892	6096488	481900	6096496	7.63	8.46	11	222		
25-Jul-2012	6:25:51	498	TB_2			Camera	25	481901	6096492	481900	6096496	-0.76	3.88	4	169		
25-Jul-2012	6:27:05	499	TB_2			Camera	26	481899	6096484	481900	6096496	1.43	12.30	12	187		
25-Jul-2012	6:28:20	500	TB_2			Camera	25	481896	6096482	481900	6096496	4.44	14.05	15	198		
25-Jul-2012	6:30:29	501	TB_2			Camera	25	481897	6096477	481900	6096496	2.51	18.69	19	188		
25-Jul-2012	6:31:19	502	TB_2			Camera	25	481897	6096475	481900	6096496	3.12	21.40	22	188		
25-Jul-2012	6:32:18	503	TB_2			Camera	24	481898	6096473	481900	6096496	1.64	23.10	23	184		
25-Jul-2012	6:33:14	504	TB_2			Camera	25	481904	6096478	481900	6096496	-3.55	18.37	19	169		
25-Jul-2012	6:33:56	505	TB_2			Camera	25	481905	6096478	481900	6096496	-5.47	17.69	19	163		
25-Jul-2012	6:34:29	506	TB_2			Camera	25	481906	6096479	481900	6096496	-6.26	17.04	18	160		
25-Jul-2012	7:34:52	507	TB_7			Camera	24	480280	6092332	480306	6092358	26.11	26.26	0	270		
25-Jul-2012	7:36:29	508	TB_7			Camera	24	480267	6092342	480306	6092358	38.98	15.54	-1	270		
25-Jul-2012	7:39:06	509	TB_7			Camera	24	480280	6092338	480306	6092358	26.31	20.10	-1	270		
25-Jul-2012	7:41:26	510	TB_7			Camera	24	480290	6092344	480306	6092358	15.53	14.05	0	271		
25-Jul-2012	7:43:43	511	TB_7			Camera	24	480308	6092351	480306	6092358	-2.13	7.40	-1	273		
25-Jul-2012	7:45:56	512	TB_7			Camera	24	480310	6092365	480306	6092358	-3.73	-6.91	-1	273		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
25-Jul-2012	7:47:26	513	TB_7			Camera	24	480315	6092370	480306	6092358	-8.86	-12.05	0	274		
25-Jul-2012	7:47:53	514	TB_7			Camera	24	480317	6092375	480306	6092358	-10.84	-17.49	-1	274		
25-Jul-2012	7:49:02	515	TB_7			Camera	24	480320	6092378	480306	6092358	-14.14	-20.02	-1	273		
25-Jul-2012	9:21:35	516	TB_18			Camera	29	476667	6098969	476679	6099015	11.57	45.73	47	194		
25-Jul-2012	9:21:58	517	TB_18			Camera	29	476669	6098970	476679	6099015	10.00	45.26	46	192		
25-Jul-2012	9:23:17	518	TB_18			Camera	29	476673	6098970	476679	6099015	6.26	45.01	45	188		
25-Jul-2012	9:24:56	519	TB_18			Camera	29	476680	6098986	476679	6099015	-0.98	29.46	29	178		
25-Jul-2012	9:26:14	520	TB_18			Camera	29	476684	6098997	476679	6099015	-4.97	18.17	19	165		
25-Jul-2012	9:27:22	521	TB_18			Camera	29	476693	6099012	476679	6099015	-14.05	3.47	14	104		
25-Jul-2012	9:28:26	522	TB_18			Camera	29	476693	6099016	476679	6099015	-14.48	-1.14	15	86		
25-Jul-2012	9:29:28	523	TB_18			Camera	29	476692	6099016	476679	6099015	-12.85	-0.87	13	86		
25-Jul-2012	9:30:47	524	TB_18			Camera	29	476689	6099009	476679	6099015	-9.80	5.88	11	121		
25-Jul-2012	9:31:09	525	TB_18			Camera	29	476687	6099004	476679	6099015	-8.36	10.51	13	141		
25-Jul-2012	9:31:40	526	TB_18			Camera	29	476685	6099003	476679	6099015	-6.09	12.11	14	153		
25-Jul-2012	10:33:19	527	TB_12			Camera	29	472422	6097925	472422	6097946	0.44	21.10	21	181		
25-Jul-2012	10:35:23	528	TB_12			Camera	29	472425	6097922	472422	6097946	-2.62	23.58	24	174		
25-Jul-2012	10:37:17	529	TB_12			Camera	29	472433	6097923	472422	6097946	-11.13	22.67	25	154		
25-Jul-2012	10:38:25	530	TB_12			Camera	29	472438	6097925	472422	6097946	-16.23	20.77	26	142		
25-Jul-2012	10:40:10	531	TB_12			Camera	29	472443	6097926	472422	6097946	-21.47	20.23	30	133		
25-Jul-2012	10:41:46	532	TB_12			Camera	29	472451	6097930	472422	6097946	-28.89	16.30	33	119		
25-Jul-2012	10:43:25	533	TB_12			Camera	29	472456	6097935	472422	6097946	-33.57	10.59	35	108		
25-Jul-2012	10:44:59	534	TB_12			Camera	29	472461	6097940	472422	6097946	-38.74	6.14	39	99		
25-Jul-2012	10:46:08	535	TB_12			Camera	29	472463	6097941	472422	6097946	-41.26	5.39	42	97		
25-Jul-2012	10:47:31	536	TB_12			Camera	29	472465	6097947	472422	6097946	-42.54	-0.86	43	89		
25-Jul-2012	11:28:04	537	TB_25			Camera	29	470967	6096825	470927	6096848	-39.65	23.10	46	120		
25-Jul-2012	11:28:58	538	TB_25			Camera	29	470967	6096830	470927	6096848	-40.08	17.73	44	114		
25-Jul-2012	11:29:50	539	TB_25			Camera	29	470964	6096838	470927	6096848	-37.10	10.10	38	105		
25-Jul-2012	11:30:57	540	TB_25			Camera	29	470962	6096845	470927	6096848	-35.08	2.94	35	95		
25-Jul-2012	11:31:49	541	TB_25			Camera	29	470957	6096850	470927	6096848	-30.02	-1.65	30	87		
25-Jul-2012	11:33:02	542	TB_25			Camera	29	470958	6096853	470927	6096848	-31.01	-4.64	31	81		
25-Jul-2012	11:34:09	543	TB_25			Camera	29	470962	6096853	470927	6096848	-34.57	-5.38	35	81		
25-Jul-2012	11:35:47	544	TB_25			Camera	29	470965	6096854	470927	6096848	-37.81	-5.95	38	81		
25-Jul-2012	11:36:49	545	TB_25			Camera	29	470960	6096849	470927	6096848	-32.83	-0.86	33	88		
25-Jul-2012	11:37:57	546	TB_25			Camera	29	470954	6096849	470927	6096848	-26.78	-1.33	27	87		
25-Jul-2012	11:38:46	547	TB_25			Camera	29	470948	6096849	470927	6096848	-20.83	-1.27	21	87		
25-Jul-2012	13:02:00	548	TB_17			Camera	29	453439	6093395	453425	6093378	-13.50	-17.07	22	38		
25-Jul-2012	13:02:15	549	TB_17			Camera	29	453439	6093396	453425	6093378	-14.42	-18.30	23	38		
25-Jul-2012	13:03:07	550	TB_17			Camera	29	453437	6093389	453425	6093378	-12.16	-11.40	17	47		
25-Jul-2012	13:04:06	551	TB_17			Camera	29	453444	6093389	453425	6093378	-18.79	-10.95	22	60		
25-Jul-2012	13:05:01	552	TB_17			Camera	29	453450	6093389	453425	6093378	-24.54	-10.70	27	66		
25-Jul-2012	13:05:51	553	TB_17			Camera	29	453442	6093390	453425	6093378	-16.98	-12.26	21	54		
25-Jul-2012	13:07:12	554	TB_17			Camera	29	453423	6093389	453425	6093378	2.18	-11.06	11	349		
25-Jul-2012	13:08:59	555	TB_17			Camera	29	453399	6093388	453425	6093378	26.09	-10.00	28	291		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
25-Jul-2012	13:10:23	556	TB_17			Camera	29	453399	6093382	453425	6093378	26.19	-4.31	27	279		
25-Jul-2012	13:49:44	557	TB_11			Camera	29	455499	6093389	455520	6093366	20.86	-22.82	31	318		
25-Jul-2012	13:50:46	558	TB_11			Camera	29	455509	6093393	455520	6093366	11.39	-26.59	29	337		
25-Jul-2012	13:51:45	559	TB_11			Camera	29	455517	6093396	455520	6093366	3.20	-30.21	30	354		
25-Jul-2012	13:52:47	560	TB_11			Camera	29	455525	6093401	455520	6093366	-4.92	-35.26	36	8		
25-Jul-2012	13:53:39	561	TB_11			Camera	29	455528	6093402	455520	6093366	-7.64	-35.67	36	12		
25-Jul-2012	13:54:46	562	TB_11			Camera	29	455532	6093399	455520	6093366	-11.57	-32.51	35	20		
25-Jul-2012	13:55:39	563	TB_11			Camera	29	455532	6093401	455520	6093366	-12.47	-35.37	38	19		
25-Jul-2012	13:56:37	564	TB_11			Camera	29	455534	6093402	455520	6093366	-14.03	-36.21	39	21		
25-Jul-2012	13:57:43	565	TB_11			Camera	29	455541	6093403	455520	6093366	-21.31	-36.74	42	30		
25-Jul-2012	13:58:35	566	TB_11			Camera	29	455542	6093402	455520	6093366	-21.88	-35.91	42	31		
25-Jul-2012	14:46:02	567	TB_22			Camera	27	457203	6096142	457215	6096139	11.98	-2.94	12	284		
25-Jul-2012	14:46:53	568	TB_22			Camera	27	457202	6096145	457215	6096139	13.26	-5.87	15	294		
25-Jul-2012	14:48:01	569	TB_22			Camera	29	457196	6096147	457215	6096139	18.85	-7.83	20	293		
25-Jul-2012	14:49:07	570	TB_22			Camera	27	457198	6096150	457215	6096139	17.06	-11.49	21	304		
25-Jul-2012	14:49:56	571	TB_22			Camera	27	457206	6096154	457215	6096139	9.46	-14.50	17	327		
25-Jul-2012	14:50:54	572	TB_22			Camera	27	457217	6096158	457215	6096139	-2.01	-18.95	19	6		
25-Jul-2012	14:51:33	573	TB_22			Camera	27	457219	6096151	457215	6096139	-3.50	-11.86	12	16		
25-Jul-2012	14:52:32	574	TB_22			Camera	23	457209	6096148	457215	6096139	5.61	-8.78	10	327		
25-Jul-2012	14:53:30	575	TB_22			Camera	27	457196	6096152	457215	6096139	19.09	-13.27	23	305		
25-Jul-2012	14:55:05	576	TB_22			Camera	27	457197	6096153	457215	6096139	17.90	-14.26	23	309		
25-Jul-2012	14:55:55	577	TB_22			Camera	27	457201	6096156	457215	6096139	13.95	-16.86	22	320		
25-Jul-2012	14:56:44	578	TB_22			Camera	27	457206	6096159	457215	6096139	8.96	-20.03	22	336		
25-Jul-2012	15:29:48	579	TB_28			Camera	29	459137	6097118	459154	6097130	16.64	11.83	20	235		
25-Jul-2012	15:30:50	580	TB_28			Camera	29	459141	6097121	459154	6097130	12.80	9.15	16	234		
25-Jul-2012	15:31:56	581	TB_28			Camera	29	459147	6097125	459154	6097130	6.58	5.09	8	232		
25-Jul-2012	15:32:52	582	TB_28			Camera	29	459152	6097127	459154	6097130	2.34	3.24	4	216		
25-Jul-2012	15:35:17	583	TB_28			Camera	29	459152	6097129	459154	6097130	1.88	1.11	2	240		
25-Jul-2012	15:36:47	584	TB_28			Camera	31	459166	6097142	459154	6097130	-12.12	-11.60	17	46		
25-Jul-2012	15:37:51	585	TB_28			Camera	29	459172	6097146	459154	6097130	-18.20	-16.10	24	49		
25-Jul-2012	15:40:28	586	TB_28			Camera	29	459191	6097161	459154	6097130	-37.45	-31.20	49	50		
25-Jul-2012	15:41:21	587	TB_28			Camera	29	459191	6097164	459154	6097130	-37.44	-34.29	51	48		
25-Jul-2012	16:31:49	588	TB_26			Camera	30	459662	6096872	459681	6096883	19.19	10.81	22	241		
25-Jul-2012	16:32:47	589	TB_26			Camera	30	459668	6096871	459681	6096883	12.87	11.60	17	228		
25-Jul-2012	16:33:40	590	TB_26			Camera	30	459668	6096872	459681	6096883	13.11	11.19	17	230		
25-Jul-2012	16:34:42	591	TB_26			Camera	30	459666	6096873	459681	6096883	15.21	10.40	18	236		
25-Jul-2012	16:35:53	592	TB_26			Camera	30	459674	6096877	459681	6096883	7.34	6.20	10	230		
25-Jul-2012	16:36:30	593	TB_26			Camera	30	459672	6096876	459681	6096883	9.46	6.93	12	234		
25-Jul-2012	16:37:20	594	TB_26			Camera	30	459666	6096876	459681	6096883	14.66	6.58	16	246		
25-Jul-2012	16:37:48	595	TB_26			Camera	30	459668	6096875	459681	6096883	13.44	8.33	16	238		
25-Jul-2012	16:37:59	596	TB_26			Camera	30	459668	6096875	459681	6096883	13.18	7.93	15	239		
25-Jul-2012	16:38:52	597	TB_26			Camera	30	459677	6096877	459681	6096883	4.27	6.06	7	215		
25-Jul-2012	17:26:24	598	TB_31			Camera	28	463043	6095427	463059	6095433	15.63	6.26	17	248		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
25-Jul-2012	17:27:11	599	TB_31			Camera	28	463048	6095426	463059	6095433	11.41	7.35	14	237		
25-Jul-2012	17:28:23	600	TB_31			Camera	28	463044	6095420	463059	6095433	15.21	12.79	20	230		
25-Jul-2012	17:29:21	601	TB_31			Camera	28	463035	6095413	463059	6095433	24.11	19.88	31	230		
25-Jul-2012	17:30:21	602	TB_31			Camera	28	463039	6095414	463059	6095433	19.97	18.99	28	226		
25-Jul-2012	17:32:25	603	TB_31			Camera	28	463041	6095413	463059	6095433	18.18	19.78	27	223		
25-Jul-2012	17:33:52	604	TB_31			Camera	28	463041	6095421	463059	6095433	18.07	11.79	22	237		
25-Jul-2012	17:35:34	605	TB_31			Camera	28	463051	6095435	463059	6095433	7.51	-2.32	8	287		
25-Jul-2012	17:37:04	606	TB_31			Camera	28	463061	6095447	463059	6095433	-2.45	-14.49	15	10		
25-Jul-2012	17:38:02	607	TB_31			Camera	28	463069	6095461	463059	6095433	-9.70	-28.38	30	19		
25-Jul-2012	17:39:31	608	TB_31			Camera	28	463056	6095462	463059	6095433	2.79	-28.63	29	354		
25-Jul-2012	17:41:16	609	TB_31			Camera	28	463062	6095479	463059	6095433	-2.96	-46.40	47	4		
25-Jul-2012	17:42:40	610	TB_31			Camera	28	463074	6095494	463059	6095433	-15.24	-61.47	63	14		
25-Jul-2012	17:44:03	611	TB_31			Camera	28	463072	6095497	463059	6095433	-12.67	-64.45	66	11		
25-Jul-2012	17:44:49	612	TB_31			Camera	28	463073	6095501	463059	6095433	-13.61	-68.31	70	11		
25-Jul-2012	18:28:27	613	TB_55			Camera	29	460073	6091990	460075	6091970	2.22	-19.62	20	354		
25-Jul-2012	18:29:16	614	TB_55			Camera	29	460077	6091987	460075	6091970	-2.17	-17.28	17	7		
25-Jul-2012	18:29:48	615	TB_55			Camera	31	460080	6091990	460075	6091970	-4.53	-19.86	20	13		
25-Jul-2012	18:30:33	616	TB_55			Camera	31	460084	6091990	460075	6091970	-9.20	-20.00	22	25		
25-Jul-2012	18:31:32	617	TB_55			Camera	31	460089	6091990	460075	6091970	-14.02	-19.63	24	36		
25-Jul-2012	18:32:21	618	TB_55			Camera	29	460089	6091988	460075	6091970	-14.43	-17.92	23	39		
25-Jul-2012	18:32:55	619	TB_55			Camera	29	460088	6091987	460075	6091970	-13.45	-16.73	21	39		
25-Jul-2012	18:33:59	620	TB_55			Camera	29	460092	6091981	460075	6091970	-16.73	-11.16	20	56		
25-Jul-2012	18:35:07	621	TB_55			Camera	29	460094	6091976	460075	6091970	-18.61	-6.37	20	71		
25-Jul-2012	18:36:30	622	TB_55			Camera	29	460076	6091964	460075	6091970	-0.53	6.50	7	175		
25-Jul-2012	18:37:26	623	TB_55			Camera	29	460069	6091954	460075	6091970	6.33	15.97	17	202		
25-Jul-2012	18:38:18	624	TB_55			Camera	29	460062	6091949	460075	6091970	13.01	21.35	25	211		
25-Jul-2012	18:39:03	625	TB_55			Camera	29	460059	6091945	460075	6091970	16.09	25.41	30	212		
25-Jul-2012	18:39:49	626	TB_55			Camera	29	460058	6091944	460075	6091970	16.96	25.91	31	213		
26-Jul-2012	8:07:57	627	TB_TRAN_07			Camera	30	502575	6112481								Transect Line, Target NOT selected
26-Jul-2012	8:09:23	628	TB_TRAN_07			Camera	30	502562	6112498								Transect Line, Target NOT selected
26-Jul-2012	8:09:54	629	TB_TRAN_07			Camera	30	502560	6112508								Transect Line, Target NOT selected
26-Jul-2012	8:10:54	630	TB_TRAN_07			Camera	30	502555	6112529								Transect Line, Target NOT selected
26-Jul-2012	8:11:32	631	TB_TRAN_07			Camera	30	502552	6112542								Transect Line, Target NOT selected
26-Jul-2012	8:12:16	632	TB_TRAN_07			Camera	32	502547	6112563								Transect Line, Target NOT selected
26-Jul-2012	8:12:40	633	TB_TRAN_07			Camera	30	502543	6112573								Transect Line, Target NOT selected
26-Jul-2012	8:13:03	634	TB_TRAN_07			Camera	30	502540	6112582								Transect Line, Target NOT selected
26-Jul-2012	8:13:28	635	TB_TRAN_07			Camera	30	502536	6112593								Transect Line, Target NOT selected
26-Jul-2012	8:13:44	636	TB_TRAN_07			Camera	30	502535	6112601								Transect Line, Target NOT selected
26-Jul-2012	8:14:38	637	TB_TRAN_07			Camera	30	502531	6112625								Transect Line, Target NOT selected
26-Jul-2012	8:15:10	638	TB_TRAN_07			Camera	30	502525	6112632								Transect Line, Target NOT selected
26-Jul-2012	8:15:25	639	TB_TRAN_07			Camera	30	502522	6112637								Transect Line, Target NOT selected
26-Jul-2012	8:15:52	640	TB_TRAN_07			Camera	32	502521	6112647								Transect Line, Target NOT selected
26-Jul-2012	8:16:20	641	TB_TRAN_07			Camera	30	502519	6112659								Transect Line, Target NOT selected

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
26-Jul-2012	8:16:31	642	TB_TRAN_07			Camera	30	502519	6112663								Transect Line, Target NOT selected
26-Jul-2012	8:16:57	643	TB_TRAN_07			Camera	30	502519	6112673								Transect Line, Target NOT selected
26-Jul-2012	8:17:14	644	TB_TRAN_07			Camera	30	502517	6112680								Transect Line, Target NOT selected
26-Jul-2012	8:17:46	645	TB_TRAN_07			Camera	30	502514	6112685								Transect Line, Target NOT selected
26-Jul-2012	8:18:00	646	TB_TRAN_07			Camera	30	502513	6112689								Transect Line, Target NOT selected
26-Jul-2012	8:18:25	647	TB_TRAN_07			Camera	30	502515	6112696								Transect Line, Target NOT selected
26-Jul-2012	8:18:37	648	TB_TRAN_07			Camera	31	502518	6112700								Transect Line, Target NOT selected
26-Jul-2012	8:18:44	649	TB_TRAN_07			Camera	30	502516	6112702								Transect Line, Target NOT selected
26-Jul-2012	8:18:58	650	TB_TRAN_07			Camera	30	502515	6112708								Transect Line, Target NOT selected
26-Jul-2012	8:19:13	651	TB_TRAN_07			Camera	30	502514	6112713								Transect Line, Target NOT selected
26-Jul-2012	8:19:22	652	TB_TRAN_07			Camera	30	502513	6112716								Transect Line, Target NOT selected
26-Jul-2012	8:19:38	653	TB_TRAN_07			Camera	31	502513	6112721								Transect Line, Target NOT selected
26-Jul-2012	8:19:49	654	TB_TRAN_07			Camera	31	502514	6112723								Transect Line, Target NOT selected
26-Jul-2012	8:20:06	655	TB_TRAN_07			Camera	30	502514	6112731								Transect Line, Target NOT selected
26-Jul-2012	8:20:29	656	TB_TRAN_07			Camera	31	502514	6112737								Transect Line, Target NOT selected
26-Jul-2012	8:20:48	657	TB_TRAN_07			Camera	31	502508	6112732								Transect Line, Target NOT selected
26-Jul-2012	10:48:01	658	TB_TRAN_08			Camera	30	496401	6093498								Transect Line, Target NOT selected
26-Jul-2012	10:48:51	659	TB_TRAN_08			Camera	30	496414	6093505								Transect Line, Target NOT selected
26-Jul-2012	10:49:07	660	TB_TRAN_08			Camera	30	496418	6093506								Transect Line, Target NOT selected
26-Jul-2012	10:49:45	661	TB_TRAN_08			Camera	31	496426	6093509								Transect Line, Target NOT selected
26-Jul-2012	10:50:23	662	TB_TRAN_08			Camera	31	496429	6093511								Transect Line, Target NOT selected
26-Jul-2012	10:50:36	663	TB_TRAN_08			Camera	31	496435	6093511								Transect Line, Target NOT selected
26-Jul-2012	10:50:53	664	TB_TRAN_08			Camera	31	496439	6093511								Transect Line, Target NOT selected
26-Jul-2012	10:52:24	665	TB_TRAN_08			Camera	31	496451	6093517								Transect Line, Target NOT selected
26-Jul-2012	10:54:14	666	TB_TRAN_08			Camera	32	496487	6093550								Transect Line, Target NOT selected
26-Jul-2012	10:54:46	667	TB_TRAN_08			Camera	32	496501	6093564								Transect Line, Target NOT selected
26-Jul-2012	10:54:53	668	TB_TRAN_08			Camera	32	496504	6093566								Transect Line, Target NOT selected
26-Jul-2012	10:55:47	669	TB_TRAN_08			Camera	33	496528	6093585								Transect Line, Target NOT selected
26-Jul-2012	10:56:46	670	TB_TRAN_08			Camera	33	496553	6093596								Transect Line, Target NOT selected
26-Jul-2012	10:57:19	671	TB_TRAN_08			Camera	33	496564	6093601								Transect Line, Target NOT selected
26-Jul-2012	10:57:35	672	TB_TRAN_08			Camera	33	496575	6093603								Transect Line, Target NOT selected
26-Jul-2012	10:58:13	673	TB_TRAN_08			Camera	33	496580	6093607								Transect Line, Target NOT selected
26-Jul-2012	10:59:03	674	TB_TRAN_08			Camera	34	496592	6093611								Transect Line, Target NOT selected
26-Jul-2012	10:59:39	675	TB_TRAN_08			Camera	34	496599	6093613								Transect Line, Target NOT selected
26-Jul-2012	11:00:42	676	TB_TRAN_08			Camera	34	496607	6093616								Transect Line, Target NOT selected
26-Jul-2012	11:01:05	677	TB_TRAN_08			Camera	33	496609	6093618								Transect Line, Target NOT selected
26-Jul-2012	11:01:16	678	TB_TRAN_08			Camera	33	496610	6093618								Transect Line, Target NOT selected
26-Jul-2012	11:02:04	679	TB_TRAN_08			Camera	33	496615	6093619								Transect Line, Target NOT selected
26-Jul-2012	11:02:24	680	TB_TRAN_08			Camera	33	496617	6093619								Transect Line, Target NOT selected
26-Jul-2012	11:03:01	681	TB_TRAN_08			Camera	33	496621	6093621								Transect Line, Target NOT selected
26-Jul-2012	11:03:35	682	TB_TRAN_08			Camera	33	496627	6093626								Transect Line, Target NOT selected
26-Jul-2012	11:03:57	683	TB_TRAN_08			Camera	32	496631	6093630								Transect Line, Target NOT selected
26-Jul-2012	11:04:43	684	TB_TRAN_08			Camera	32	496640	6093638								Transect Line, Target NOT selected

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Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT							
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG							
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0	
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum				

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
26-Jul-2012	11:05:04	685	TB_TRAN_08			Camera	32	496645	6093641								Transect Line, Target NOT selected
26-Jul-2012	11:05:23	686	TB_TRAN_08			Camera	34	496647	6093644								Transect Line, Target NOT selected
26-Jul-2012	11:06:05	687	TB_TRAN_08			Camera	32	496657	6093653								Transect Line, Target NOT selected
26-Jul-2012	11:06:34	688	TB_TRAN_08			Camera	32	496663	6093659								Transect Line, Target NOT selected
26-Jul-2012	11:06:45	689	TB_TRAN_08			Camera	32	496665	6093661								Transect Line, Target NOT selected
26-Jul-2012	11:07:10	690	TB_TRAN_08			Camera	32	496670	6093665								Transect Line, Target NOT selected
26-Jul-2012	11:07:31	691	TB_TRAN_08			Camera	32	496674	6093669								Transect Line, Target NOT selected
26-Jul-2012	11:07:48	692	TB_TRAN_08			Camera	32	496678	6093672								Transect Line, Target NOT selected
26-Jul-2012	11:08:30	693	TB_TRAN_08			Camera	32	496685	6093678								Transect Line, Target NOT selected
26-Jul-2012	11:08:38	694	TB_TRAN_08			Camera	32	496685	6093678								Transect Line, Target NOT selected
26-Jul-2012	11:09:34	695	TB_TRAN_08			Camera	34	496699	6093689								Transect Line, Target NOT selected
26-Jul-2012	14:22:19	696	TB_TRAN_09			Camera	30	465356	6094365								Transect Line, Target NOT selected
26-Jul-2012	14:22:31	697	TB_TRAN_09			Camera	30	465355	6094367								Transect Line, Target NOT selected
26-Jul-2012	14:23:10	698	TB_TRAN_09			Camera	30	465346	6094359								Transect Line, Target NOT selected
26-Jul-2012	14:23:27	699	TB_TRAN_09			Camera	30	465343	6094355								Transect Line, Target NOT selected
26-Jul-2012	14:24:09	700	TB_TRAN_09			Camera	30	465335	6094346								Transect Line, Target NOT selected
26-Jul-2012	14:24:31	701	TB_TRAN_09			Camera	30	465331	6094339								Transect Line, Target NOT selected
26-Jul-2012	14:24:58	702	TB_TRAN_09			Camera	30	465328	6094334								Transect Line, Target NOT selected
26-Jul-2012	14:25:40	703	TB_TRAN_09			Camera	30	465323	6094330								Transect Line, Target NOT selected
26-Jul-2012	14:26:10	704	TB_TRAN_09			Camera	30	465319	6094325								Transect Line, Target NOT selected
26-Jul-2012	14:26:45	705	TB_TRAN_09			Camera	30	465315	6094320								Transect Line, Target NOT selected
26-Jul-2012	14:26:58	706	TB_TRAN_09			Camera	30	465313	6094319								Transect Line, Target NOT selected
26-Jul-2012	14:27:29	707	TB_TRAN_09			Camera	30	465311	6094317								Transect Line, Target NOT selected
26-Jul-2012	14:28:48	708	TB_TRAN_09			Camera	32	465299	6094303								Transect Line, Target NOT selected
26-Jul-2012	14:29:05	709	TB_TRAN_09			Camera	30	465299	6094301								Transect Line, Target NOT selected
26-Jul-2012	14:29:33	710	TB_TRAN_09			Camera	30	465295	6094298								Transect Line, Target NOT selected
26-Jul-2012	14:30:08	711	TB_TRAN_09			Camera	30	465291	6094296								Transect Line, Target NOT selected
26-Jul-2012	14:30:22	712	TB_TRAN_09			Camera	26	465290	6094294								Transect Line, Target NOT selected
26-Jul-2012	14:31:00	713	TB_TRAN_09			Camera	30	465285	6094291								Transect Line, Target NOT selected
26-Jul-2012	14:32:46	714	TB_TRAN_09			Camera	29	465273	6094277								Transect Line, Target NOT selected
26-Jul-2012	14:33:01	715	TB_TRAN_09			Camera	29	465271	6094275								Transect Line, Target NOT selected
26-Jul-2012	14:33:28	716	TB_TRAN_09			Camera	29	465269	6094271								Transect Line, Target NOT selected
26-Jul-2012	14:33:46	717	TB_TRAN_09			Camera	29	465267	6094269								Transect Line, Target NOT selected
26-Jul-2012	14:34:20	718	TB_TRAN_09			Camera	29	465263	6094264								Transect Line, Target NOT selected
26-Jul-2012	14:34:28	719	TB_TRAN_09			Camera	29	465258	6094264								Transect Line, Target NOT selected
26-Jul-2012	14:34:38	720	TB_TRAN_09			Camera	29	465259	6094263								Transect Line, Target NOT selected
26-Jul-2012	14:35:05	721	TB_TRAN_09			Camera	30	465255	6094262								Transect Line, Target NOT selected
26-Jul-2012	14:35:20	722	TB_TRAN_09			Camera	29	465252	6094261								Transect Line, Target NOT selected
26-Jul-2012	14:35:35	723	TB_TRAN_09			Camera	29	465249	6094259								Transect Line, Target NOT selected
26-Jul-2012	14:35:47	724	TB_TRAN_09			Camera	29	465247	6094257								Transect Line, Target NOT selected
26-Jul-2012	14:35:59	725	TB_TRAN_09			Camera	29	465245	6094255								Transect Line, Target NOT selected
26-Jul-2012	14:36:09	726	TB_TRAN_09			Camera	29	465244	6094254								Transect Line, Target NOT selected
26-Jul-2012	14:36:35	727	TB_TRAN_09			Camera	29	465239	6094250								Transect Line, Target NOT selected

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
26-Jul-2012	14:36:49	728	TB_TRAN_09			Camera	29	465237	6094248								Transect Line, Target NOT selected
26-Jul-2012	14:37:07	729	TB_TRAN_09			Camera	29	465234	6094245								Transect Line, Target NOT selected
26-Jul-2012	14:37:18	730	TB_TRAN_09			Camera	29	465232	6094243								Transect Line, Target NOT selected
26-Jul-2012	14:37:34	731	TB_TRAN_09			Camera	29	465230	6094240								Transect Line, Target NOT selected
26-Jul-2012	14:37:57	732	TB_TRAN_09			Camera	29	465226	6094237								Transect Line, Target NOT selected
26-Jul-2012	14:38:12	733	TB_TRAN_09			Camera	29	465224	6094236								Transect Line, Target NOT selected
26-Jul-2012	14:38:22	734	TB_TRAN_09			Camera	29	465222	6094235								Transect Line, Target NOT selected
26-Jul-2012	14:38:44	735	TB_TRAN_09			Camera	29	465218	6094234								Transect Line, Target NOT selected
26-Jul-2012	14:39:06	736	TB_TRAN_09			Camera	29	465213	6094233								Transect Line, Target NOT selected
26-Jul-2012	14:39:35	737	TB_TRAN_09			Camera	29	465206	6094230								Transect Line, Target NOT selected
26-Jul-2012	14:40:05	738	TB_TRAN_09			Camera	29	465198	6094228								Transect Line, Target NOT selected
26-Jul-2012	14:40:15	739	TB_TRAN_09			Camera	29	465194	6094226								Transect Line, Target NOT selected
26-Jul-2012	14:40:30	740	TB_TRAN_09			Camera	29	465191	6094224								Transect Line, Target NOT selected
26-Jul-2012	14:40:49	741	TB_TRAN_09			Camera	30	465186	6094222								Transect Line, Target NOT selected
26-Jul-2012	14:41:18	742	TB_TRAN_09			Camera	29	465178	6094221								Transect Line, Target NOT selected
26-Jul-2012	14:42:14	743	TB_TRAN_09			Camera	28	465175	6094243								Transect Line, Target NOT selected
26-Jul-2012	14:42:29	744	TB_TRAN_09			Camera	28	465172	6094245								Transect Line, Target NOT selected
26-Jul-2012	14:43:05	745	TB_TRAN_09			Camera	28	465164	6094243								Transect Line, Target NOT selected
26-Jul-2012	14:43:26	746	TB_TRAN_09			Camera	28	465161	6094240								Transect Line, Target NOT selected
26-Jul-2012	14:43:43	747	TB_TRAN_09			Camera	28	465159	6094236								Transect Line, Target NOT selected
26-Jul-2012	14:44:00	748	TB_TRAN_09			Camera	28	465156	6094234								Transect Line, Target NOT selected
26-Jul-2012	14:44:24	749	TB_TRAN_09			Camera	28	465153	6094229								Transect Line, Target NOT selected
26-Jul-2012	14:44:39	750	TB_TRAN_09			Camera	28	465151	6094227								Transect Line, Target NOT selected
26-Jul-2012	16:15:47	751	TB_TRAN_05			Camera	34	466467	6105359								Transect Line, Target NOT selected
26-Jul-2012	16:16:08	752	TB_TRAN_05			Camera	32	466471	6105352								Transect Line, Target NOT selected
26-Jul-2012	16:16:58	753	TB_TRAN_05			Camera	33	466485	6105341								Transect Line, Target NOT selected
26-Jul-2012	16:17:19	754	TB_TRAN_05			Camera	32	466487	6105338								Transect Line, Target NOT selected
26-Jul-2012	16:18:01	755	TB_TRAN_05			Camera	32	466489	6105333								Transect Line, Target NOT selected
26-Jul-2012	16:18:23	756	TB_TRAN_05			Camera	33	466487	6105331								Transect Line, Target NOT selected
26-Jul-2012	16:19:01	757	TB_TRAN_05			Camera	32	466483	6105325								Transect Line, Target NOT selected
26-Jul-2012	16:19:47	758	TB_TRAN_05			Camera	32	466481	6105316								Transect Line, Target NOT selected
26-Jul-2012	16:20:39	759	TB_TRAN_05			Camera	32	466483	6105306								Transect Line, Target NOT selected
26-Jul-2012	16:21:12	760	TB_TRAN_05			Camera	4	466488	6105299								Transect Line, Target NOT selected
26-Jul-2012	16:22:06	761	TB_TRAN_05			Camera	32	466497	6105292								Transect Line, Target NOT selected
26-Jul-2012	16:23:13	762	TB_TRAN_05			Camera	33	466513	6105280								Transect Line, Target NOT selected
26-Jul-2012	16:23:51	763	TB_TRAN_05			Camera	32	466526	6105269								Transect Line, Target NOT selected
26-Jul-2012	16:24:09	764	TB_TRAN_05			Camera	32	466532	6105263								Transect Line, Target NOT selected
26-Jul-2012	16:24:43	765	TB_TRAN_05			Camera	33	466539	6105254								Transect Line, Target NOT selected
26-Jul-2012	16:25:13	766	TB_TRAN_05			Camera	32	466546	6105240								Transect Line, Target NOT selected
26-Jul-2012	16:25:35	767	TB_TRAN_05			Camera	32	466550	6105229								Transect Line, Target NOT selected
26-Jul-2012	16:25:45	768	TB_TRAN_05			Camera	32	466551	6105228								Transect Line, Target NOT selected
26-Jul-2012	16:27:35	769	TB_TRAN_05			Camera	29	466576	6105179								Transect Line, Target NOT selected
26-Jul-2012	16:27:58	770	TB_TRAN_05			Camera	32	466579	6105171								Transect Line, Target NOT selected

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
26-Jul-2012	16:28:36	771	TB_TRAN_05			Camera	32	466583	6105162								Transect Line, Target NOT selected
26-Jul-2012	16:29:25	772	TB_TRAN_05			Camera	4	466582	6105144								Transect Line, Target NOT selected
26-Jul-2012	16:30:07	773	TB_TRAN_05			Camera	32	466582	6105127								Transect Line, Target NOT selected
26-Jul-2012	16:30:36	774	TB_TRAN_05			Camera	32	466581	6105117								Transect Line, Target NOT selected
26-Jul-2012	16:31:06	775	TB_TRAN_05			Camera	31	466580	6105108								Transect Line, Target NOT selected
26-Jul-2012	16:32:08	776	TB_TRAN_05			Camera	32	466587	6105091								Transect Line, Target NOT selected
26-Jul-2012	16:32:42	777	TB_TRAN_05			Camera	32	466596	6105082								Transect Line, Target NOT selected
26-Jul-2012	16:33:15	778	TB_TRAN_05			Camera	32	466602	6105078								Transect Line, Target NOT selected
26-Jul-2012	16:33:26	779	TB_TRAN_05			Camera	32	466604	6105076								Transect Line, Target NOT selected
26-Jul-2012	17:36:50	780	TB_TRAN_06			Camera	37	466216	6109735								Transect Line, Target NOT selected
26-Jul-2012	17:37:23	781	TB_TRAN_06			Camera	37	466223	6109734								Transect Line, Target NOT selected
26-Jul-2012	17:37:40	782	TB_TRAN_06			Camera	38	466233	6109728								Transect Line, Target NOT selected
26-Jul-2012	17:38:32	783	TB_TRAN_06			Camera	38	466252	6109723								Transect Line, Target NOT selected
26-Jul-2012	17:39:29	784	TB_TRAN_06			Camera	38	466268	6109722								Transect Line, Target NOT selected
26-Jul-2012	17:39:56	785	TB_TRAN_06			Camera	37	466279	6109721								Transect Line, Target NOT selected
26-Jul-2012	17:40:26	786	TB_TRAN_06			Camera	37	466289	6109719								Transect Line, Target NOT selected
26-Jul-2012	17:40:42	787	TB_TRAN_06			Camera	37	466295	6109719								Transect Line, Target NOT selected
26-Jul-2012	17:41:40	788	TB_TRAN_06			Camera	37	466316	6109722								Transect Line, Target NOT selected
26-Jul-2012	17:42:15	789	TB_TRAN_06			Camera	39	466327	6109723								Transect Line, Target NOT selected
26-Jul-2012	17:42:37	790	TB_TRAN_06			Camera	37	466331	6109726								Transect Line, Target NOT selected
26-Jul-2012	17:43:03	791	TB_TRAN_06			Camera	38	466338	6109726								Transect Line, Target NOT selected
26-Jul-2012	17:43:22	792	TB_TRAN_06			Camera	38	466344	6109728								Transect Line, Target NOT selected
26-Jul-2012	17:44:31	793	TB_TRAN_06			Camera	38	466371	6109721								Transect Line, Target NOT selected
26-Jul-2012	17:44:52	794	TB_TRAN_06			Camera	34	466382	6109723								Transect Line, Target NOT selected
26-Jul-2012	17:45:01	795	TB_TRAN_06			Camera	38	466384	6109723								Transect Line, Target NOT selected
26-Jul-2012	17:45:09	796	TB_TRAN_06			Camera	38	466389	6109721								Transect Line, Target NOT selected
26-Jul-2012	17:45:17	797	TB_TRAN_06			Camera	38	466393	6109721								Transect Line, Target NOT selected
26-Jul-2012	17:45:31	798	TB_TRAN_06			Camera	38	466398	6109721								Transect Line, Target NOT selected
26-Jul-2012	17:45:37	799	TB_TRAN_06			Camera	38	466400	6109722								Transect Line, Target NOT selected
26-Jul-2012	17:46:16	800	TB_TRAN_06			Camera	38	466414	6109722								Transect Line, Target NOT selected
26-Jul-2012	17:46:34	801	TB_TRAN_06			Camera	38	466421	6109722								Transect Line, Target NOT selected
26-Jul-2012	17:46:57	802	TB_TRAN_06			Camera	39	466430	6109721								Transect Line, Target NOT selected
26-Jul-2012	17:47:15	803	TB_TRAN_06			Camera	39	466436	6109721								Transect Line, Target NOT selected
26-Jul-2012	17:47:29	804	TB_TRAN_06			Camera	38	466441	6109720								Transect Line, Target NOT selected
26-Jul-2012	17:47:39	805	TB_TRAN_06			Camera	38	466446	6109720								Transect Line, Target NOT selected
26-Jul-2012	17:47:55	806	TB_TRAN_06			Camera	38	466451	6109719								Transect Line, Target NOT selected
26-Jul-2012	17:48:01	807	TB_TRAN_06			Camera	38	466454	6109720								Transect Line, Target NOT selected
26-Jul-2012	17:48:11	808	TB_TRAN_06			Camera	38	466457	6109719								Transect Line, Target NOT selected
26-Jul-2012	17:48:24	809	TB_TRAN_06			Camera	38	466463	6109719								Transect Line, Target NOT selected
26-Jul-2012	17:48:35	810	TB_TRAN_06			Camera	38	466466	6109718								Transect Line, Target NOT selected
26-Jul-2012	18:44:09	811	TB_TRAN_04			Camera	37	459258	6105755								Transect Line, Target NOT selected
26-Jul-2012	18:44:20	812	TB_TRAN_04			Camera	37	459262	6105752								Transect Line, Target NOT selected
26-Jul-2012	18:44:31	813	TB_TRAN_04			Camera	38	459266	6105749								Transect Line, Target NOT selected

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
26-Jul-2012	18:44:41	814	TB_TRAN_04			Camera	33	459270	6105745								Transect Line, Target NOT selected
26-Jul-2012	18:45:01	815	TB_TRAN_04			Camera	37	459279	6105741								Transect Line, Target NOT selected
26-Jul-2012	18:45:14	816	TB_TRAN_04			Camera	38	459284	6105738								Transect Line, Target NOT selected
26-Jul-2012	18:45:40	817	TB_TRAN_04			Camera	37	459295	6105734								Transect Line, Target NOT selected
26-Jul-2012	18:45:52	818	TB_TRAN_04			Camera	37	459299	6105731								Transect Line, Target NOT selected
26-Jul-2012	18:46:18	819	TB_TRAN_04			Camera	33	459308	6105728								Transect Line, Target NOT selected
26-Jul-2012	18:46:30	820	TB_TRAN_04			Camera	37	459312	6105725								Transect Line, Target NOT selected
26-Jul-2012	18:46:38	821	TB_TRAN_04			Camera	37	459314	6105723								Transect Line, Target NOT selected
26-Jul-2012	18:46:56	822	TB_TRAN_04			Camera	37	459319	6105720								Transect Line, Target NOT selected
26-Jul-2012	18:47:10	823	TB_TRAN_04			Camera	37	459322	6105717								Transect Line, Target NOT selected
26-Jul-2012	18:47:25	824	TB_TRAN_04			Camera	37	459325	6105715								Transect Line, Target NOT selected
26-Jul-2012	18:47:32	825	TB_TRAN_04			Camera	37	459326	6105714								Transect Line, Target NOT selected
26-Jul-2012	18:48:04	826	TB_TRAN_04			Camera	37	459331	6105708								Transect Line, Target NOT selected
26-Jul-2012	18:48:27	827	TB_TRAN_04			Camera	37	459334	6105706								Transect Line, Target NOT selected
26-Jul-2012	18:48:46	828	TB_TRAN_04			Camera	37	459338	6105700								Transect Line, Target NOT selected
26-Jul-2012	18:49:02	829	TB_TRAN_04			Camera	37	459340	6105698								Transect Line, Target NOT selected
26-Jul-2012	18:49:25	830	TB_TRAN_04			Camera	37	459344	6105694								Transect Line, Target NOT selected
26-Jul-2012	18:49:46	831	TB_TRAN_04			Camera	37	459348	6105688								Transect Line, Target NOT selected
26-Jul-2012	18:50:04	832	TB_TRAN_04			Camera	37	459352	6105685								Transect Line, Target NOT selected
26-Jul-2012	18:50:33	833	TB_TRAN_04			Camera	37	459357	6105683								Transect Line, Target NOT selected
26-Jul-2012	18:50:51	834	TB_TRAN_04			Camera	4	459363	6105672								Transect Line, Target NOT selected
26-Jul-2012	18:51:05	835	TB_TRAN_04			Camera	37	459368	6105669								Transect Line, Target NOT selected
26-Jul-2012	18:51:22	836	TB_TRAN_04			Camera	37	459371	6105668								Transect Line, Target NOT selected
26-Jul-2012	18:52:01	837	TB_TRAN_04			Camera	37	459380	6105656								Transect Line, Target NOT selected
26-Jul-2012	18:52:10	838	TB_TRAN_04			Camera	37	459387	6105659								Transect Line, Target NOT selected
26-Jul-2012	18:52:24	839	TB_TRAN_04			Camera	37	459389	6105652								Transect Line, Target NOT selected
26-Jul-2012	18:52:49	840	TB_TRAN_04			Camera	37	459390	6105641								Transect Line, Target NOT selected
26-Jul-2012	18:53:12	841	TB_TRAN_04			Camera	37	459396	6105635								Transect Line, Target NOT selected
26-Jul-2012	18:53:31	842	TB_TRAN_04			Camera	36	459407	6105623								Transect Line, Target NOT selected
26-Jul-2012	18:54:00	843	TB_TRAN_04			Camera	36	459405	6105619								Transect Line, Target NOT selected
26-Jul-2012	18:54:13	844	TB_TRAN_04			Camera	36	459408	6105615								Transect Line, Target NOT selected
26-Jul-2012	18:55:01	845	TB_TRAN_04			Camera	36	459418	6105603								Transect Line, Target NOT selected
26-Jul-2012	18:55:36	846	TB_TRAN_04			Camera	36	459427	6105596								Transect Line, Target NOT selected
26-Jul-2012	18:56:20	847	TB_TRAN_04			Camera	36	459453	6105602								Transect Line, Target NOT selected
26-Jul-2012	18:56:37	848	TB_TRAN_04			Camera	32	459447	6105589								Transect Line, Target NOT selected
26-Jul-2012	18:56:58	849	TB_TRAN_04			Camera	36	459455	6105578								Transect Line, Target NOT selected
26-Jul-2012	18:57:16	850	TB_TRAN_04			Camera	36	459463	6105575								Transect Line, Target NOT selected
26-Jul-2012	18:57:37	851	TB_TRAN_04			Camera	36	459470	6105570								Transect Line, Target NOT selected
26-Jul-2012	18:58:05	852	TB_TRAN_04			Camera	36	459476	6105564								Transect Line, Target NOT selected
26-Jul-2012	18:58:13	853	TB_TRAN_04			Camera	37	459476	6105562								Transect Line, Target NOT selected
26-Jul-2012	18:59:01	854	TB_TRAN_04			Camera	36	459481	6105557								Transect Line, Target NOT selected
26-Jul-2012	19:32:42	855	TB_TRAN_03			Camera	34	459956	6104480								Transect Line, Target NOT selected
26-Jul-2012	19:33:09	856	TB_TRAN_03			Camera	34	459948	6104473								Transect Line, Target NOT selected

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
26-Jul-2012	19:33:42	857	TB_TRAN_03			Camera	4	459939	6104462								Transect Line, Target NOT selected
26-Jul-2012	19:34:11	858	TB_TRAN_03			Camera	34	459933	6104451								Transect Line, Target NOT selected
26-Jul-2012	19:34:42	859	TB_TRAN_03			Camera	34	459922	6104441								Transect Line, Target NOT selected
26-Jul-2012	19:35:19	860	TB_TRAN_03			Camera	34	459910	6104433								Transect Line, Target NOT selected
26-Jul-2012	19:35:42	861	TB_TRAN_03			Camera	34	459904	6104427								Transect Line, Target NOT selected
26-Jul-2012	19:36:03	862	TB_TRAN_03			Camera	33	459901	6104425								Transect Line, Target NOT selected
26-Jul-2012	19:36:52	863	TB_TRAN_03			Camera	33	459888	6104423								Transect Line, Target NOT selected
26-Jul-2012	19:37:26	864	TB_TRAN_03			Camera	4	459886	6104414								Transect Line, Target NOT selected
26-Jul-2012	19:38:12	865	TB_TRAN_03			Camera	33	459885	6104407								Transect Line, Target NOT selected
26-Jul-2012	19:38:42	866	TB_TRAN_03			Camera	33	459881	6104404								Transect Line, Target NOT selected
26-Jul-2012	19:39:02	867	TB_TRAN_03			Camera	33	459877	6104401								Transect Line, Target NOT selected
26-Jul-2012	19:39:38	868	TB_TRAN_03			Camera	33	459871	6104391								Transect Line, Target NOT selected
26-Jul-2012	19:40:08	869	TB_TRAN_03			Camera	33	459865	6104381								Transect Line, Target NOT selected
26-Jul-2012	19:40:37	870	TB_TRAN_03			Camera	33	459861	6104370								Transect Line, Target NOT selected
26-Jul-2012	19:41:24	871	TB_TRAN_03			Camera	33	459854	6104356								Transect Line, Target NOT selected
26-Jul-2012	19:42:02	872	TB_TRAN_03			Camera	33	459850	6104345								Transect Line, Target NOT selected
26-Jul-2012	19:42:44	873	TB_TRAN_03			Camera	33	459847	6104327								Transect Line, Target NOT selected
26-Jul-2012	19:43:17	874	TB_TRAN_03			Camera	33	459846	6104317								Transect Line, Target NOT selected
26-Jul-2012	19:43:41	875	TB_TRAN_03			Camera	33	459844	6104313								Transect Line, Target NOT selected
26-Jul-2012	19:44:06	876	TB_TRAN_03			Camera	33	459844	6104308								Transect Line, Target NOT selected
26-Jul-2012	19:44:51	877	TB_TRAN_03			Camera	33	459833	6104311								Transect Line, Target NOT selected
26-Jul-2012	19:45:25	878	TB_TRAN_03			Camera	33	459826	6104313								Transect Line, Target NOT selected
26-Jul-2012	19:45:53	879	TB_TRAN_03			Camera	34	459824	6104308								Transect Line, Target NOT selected
26-Jul-2012	19:46:20	880	TB_TRAN_03			Camera	34	459822	6104300								Transect Line, Target NOT selected
26-Jul-2012	19:47:06	881	TB_TRAN_03			Camera	33	459818	6104296								Transect Line, Target NOT selected
26-Jul-2012	19:48:08	882	TB_TRAN_03			Camera	33	459816	6104278								Transect Line, Target NOT selected
26-Jul-2012	19:48:44	883	TB_TRAN_03			Camera	33	459816	6104264								Transect Line, Target NOT selected
26-Jul-2012	19:50:08	884	TB_TRAN_03			Camera	33	459811	6104236								Transect Line, Target NOT selected
26-Jul-2012	19:50:50	885	TB_TRAN_03			Camera	33	459805	6104230								Transect Line, Target NOT selected
26-Jul-2012	19:52:03	886	TB_TRAN_03			Camera	32	459799	6104212								Transect Line, Target NOT selected
26-Jul-2012	19:52:45	887	TB_TRAN_03			Camera	32	459791	6104208								Transect Line, Target NOT selected
26-Jul-2012	19:53:31	888	TB_TRAN_03			Camera	32	459787	6104200								Transect Line, Target NOT selected
26-Jul-2012	19:54:23	889	TB_TRAN_03			Camera	32	459776	6104199								Transect Line, Target NOT selected
26-Jul-2012	19:55:06	890	TB_TRAN_03			Camera	32	459757	6104203								Transect Line, Target NOT selected
26-Jul-2012	19:56:02	891	TB_TRAN_03			Camera	32	459758	6104188								Transect Line, Target NOT selected
26-Jul-2012	19:56:57	892	TB_TRAN_03			Camera	31	459748	6104192								Transect Line, Target NOT selected
26-Jul-2012	19:57:21	893	TB_TRAN_03			Camera	4	459747	6104183								Transect Line, Target NOT selected
26-Jul-2012	19:57:51	894	TB_TRAN_03			Camera	4	459760	6104176								Transect Line, Target NOT selected
26-Jul-2012	19:58:20	895	TB_TRAN_03			Camera	4	459760	6104176								Transect Line, Target NOT selected
26-Jul-2012	20:50:11	896	TB_TRAN_02			Camera	34	455617	6102522								Transect Line, Target NOT selected
26-Jul-2012	20:50:19	897	TB_TRAN_02			Camera	34	455620	6102519								Transect Line, Target NOT selected
26-Jul-2012	20:50:26	898	TB_TRAN_02			Camera	34	455622	6102517								Transect Line, Target NOT selected
26-Jul-2012	20:50:34	899	TB_TRAN_02			Camera	35	455624	6102514								Transect Line, Target NOT selected

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
26-Jul-2012	20:50:42	900	TB_TRAN_02			Camera	34	455626	6102512								Transect Line, Target NOT selected
26-Jul-2012	20:50:51	901	TB_TRAN_02			Camera	35	455630	6102509								Transect Line, Target NOT selected
26-Jul-2012	20:51:02	902	TB_TRAN_02			Camera	34	455633	6102505								Transect Line, Target NOT selected
26-Jul-2012	20:51:16	903	TB_TRAN_02			Camera	34	455636	6102501								Transect Line, Target NOT selected
26-Jul-2012	20:51:28	904	TB_TRAN_02			Camera	34	455639	6102499								Transect Line, Target NOT selected
26-Jul-2012	20:51:53	905	TB_TRAN_02			Camera	34	455646	6102494								Transect Line, Target NOT selected
26-Jul-2012	20:52:31	906	TB_TRAN_02			Camera	34	455657	6102490								Transect Line, Target NOT selected
26-Jul-2012	20:52:39	907	TB_TRAN_02			Camera	34	455659	6102490								Transect Line, Target NOT selected
26-Jul-2012	20:52:55	908	TB_TRAN_02			Camera	34	455663	6102489								Transect Line, Target NOT selected
26-Jul-2012	20:53:05	909	TB_TRAN_02			Camera	34	455667	6102488								Transect Line, Target NOT selected
26-Jul-2012	20:53:18	910	TB_TRAN_02			Camera	34	455670	6102487								Transect Line, Target NOT selected
26-Jul-2012	20:53:30	911	TB_TRAN_02			Camera	34	455673	6102487								Transect Line, Target NOT selected
26-Jul-2012	20:53:44	912	TB_TRAN_02			Camera	34	455676	6102486								Transect Line, Target NOT selected
26-Jul-2012	20:53:52	913	TB_TRAN_02			Camera	34	455677	6102486								Transect Line, Target NOT selected
26-Jul-2012	20:54:03	914	TB_TRAN_02			Camera	34	455679	6102486								Transect Line, Target NOT selected
26-Jul-2012	20:54:15	915	TB_TRAN_02			Camera	34	455682	6102486								Transect Line, Target NOT selected
26-Jul-2012	20:54:22	916	TB_TRAN_02			Camera	34	455682	6102486								Transect Line, Target NOT selected
26-Jul-2012	20:54:34	917	TB_TRAN_02			Camera	34	455685	6102485								Transect Line, Target NOT selected
26-Jul-2012	20:54:42	918	TB_TRAN_02			Camera	34	455686	6102484								Transect Line, Target NOT selected
26-Jul-2012	20:54:53	919	TB_TRAN_02			Camera	34	455688	6102481								Transect Line, Target NOT selected
26-Jul-2012	20:55:29	920	TB_TRAN_02			Camera	34	455692	6102471								Transect Line, Target NOT selected
26-Jul-2012	20:56:47	921	TB_TRAN_02			Camera	35	455702	6102441								Transect Line, Target NOT selected
26-Jul-2012	20:56:50	922	TB_TRAN_02			Camera	35	455703	6102439								Transect Line, Target NOT selected
26-Jul-2012	20:57:02	923	TB_TRAN_02			Camera	34	455706	6102434								Transect Line, Target NOT selected
26-Jul-2012	20:57:17	924	TB_TRAN_02			Camera	34	455710	6102429								Transect Line, Target NOT selected
26-Jul-2012	20:57:24	925	TB_TRAN_02			Camera	34	455712	6102426								Transect Line, Target NOT selected
26-Jul-2012	20:57:35	926	TB_TRAN_02			Camera	34	455715	6102423								Transect Line, Target NOT selected
26-Jul-2012	20:57:51	927	TB_TRAN_02			Camera	35	455720	6102417								Transect Line, Target NOT selected
26-Jul-2012	20:58:00	928	TB_TRAN_02			Camera	35	455722	6102415								Transect Line, Target NOT selected
26-Jul-2012	20:58:18	929	TB_TRAN_02			Camera	34	455726	6102410								Transect Line, Target NOT selected
26-Jul-2012	20:58:25	930	TB_TRAN_02			Camera	35	455728	6102408								Transect Line, Target NOT selected
26-Jul-2012	20:58:35	931	TB_TRAN_02			Camera	35	455731	6102407								Transect Line, Target NOT selected
26-Jul-2012	20:58:44	932	TB_TRAN_02			Camera	35	455732	6102405								Transect Line, Target NOT selected
26-Jul-2012	20:58:51	933	TB_TRAN_02			Camera	35	455734	6102403								Transect Line, Target NOT selected
26-Jul-2012	20:59:01	934	TB_TRAN_02			Camera	35	455734	6102402								Transect Line, Target NOT selected
26-Jul-2012	20:59:15	935	TB_TRAN_02			Camera	35	455736	6102400								Transect Line, Target NOT selected
26-Jul-2012	20:59:26	936	TB_TRAN_02			Camera	35	455738	6102398								Transect Line, Target NOT selected
26-Jul-2012	20:59:36	937	TB_TRAN_02			Camera	35	455739	6102395								Transect Line, Target NOT selected
26-Jul-2012	20:59:48	938	TB_TRAN_02			Camera	34	455739	6102391								Transect Line, Target NOT selected
26-Jul-2012	21:00:03	939	TB_TRAN_02			Camera	35	455739	6102389								Transect Line, Target NOT selected
26-Jul-2012	21:00:19	940	TB_TRAN_02			Camera	34	455742	6102384								Transect Line, Target NOT selected
26-Jul-2012	21:00:59	941	TB_TRAN_02			Camera	35	455745	6102378								Transect Line, Target NOT selected
26-Jul-2012	21:01:15	942	TB_TRAN_02			Camera	35	455746	6102376								Transect Line, Target NOT selected

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
26-Jul-2012	21:01:23	943	TB_TRAN_02			Camera	35	455747	6102375								Transect Line, Target NOT selected
26-Jul-2012	21:01:43	944	TB_TRAN_02			Camera	35	455750	6102373								Transect Line, Target NOT selected
26-Jul-2012	21:01:50	945	TB_TRAN_02			Camera	35	455753	6102372								Transect Line, Target NOT selected
26-Jul-2012	21:02:00	946	TB_TRAN_02			Camera	35	455757	6102369								Transect Line, Target NOT selected
26-Jul-2012	21:02:15	947	TB_TRAN_02			Camera	35	455763	6102365								Transect Line, Target NOT selected
26-Jul-2012	21:02:26	948	TB_TRAN_02			Camera	35	455767	6102364								Transect Line, Target NOT selected
26-Jul-2012	21:02:46	949	TB_TRAN_02			Camera	35	455775	6102360								Transect Line, Target NOT selected
26-Jul-2012	21:02:58	950	TB_TRAN_02			Camera	35	455780	6102356								Transect Line, Target NOT selected
26-Jul-2012	21:03:04	951	TB_TRAN_02			Camera	35	455781	6102357								Transect Line, Target NOT selected
26-Jul-2012	21:03:16	952	TB_TRAN_02			Camera	35	455785	6102356								Transect Line, Target NOT selected
26-Jul-2012	21:03:23	953	TB_TRAN_02			Camera	35	455787	6102355								Transect Line, Target NOT selected
26-Jul-2012	21:03:34	954	TB_TRAN_02			Camera	35	455790	6102354								Transect Line, Target NOT selected
26-Jul-2012	21:03:57	955	TB_TRAN_02			Camera	35	455794	6102352								Transect Line, Target NOT selected
26-Jul-2012	22:27:01	956	TB_TRAN_01			Camera	34	438056	6102757								Transect Line, Target NOT selected
26-Jul-2012	22:27:23	957	TB_TRAN_01			Camera	35	438064	6102764								Transect Line, Target NOT selected
26-Jul-2012	22:27:33	958	TB_TRAN_01			Camera	35	438068	6102766								Transect Line, Target NOT selected
26-Jul-2012	22:28:00	959	TB_TRAN_01			Camera	34	438075	6102773								Transect Line, Target NOT selected
26-Jul-2012	22:28:59	960	TB_TRAN_01			Camera	35	438088	6102789								Transect Line, Target NOT selected
26-Jul-2012	22:29:12	961	TB_TRAN_01			Camera	35	438091	6102793								Transect Line, Target NOT selected
26-Jul-2012	22:29:28	962	TB_TRAN_01			Camera	35	438096	6102798								Transect Line, Target NOT selected
26-Jul-2012	22:29:51	963	TB_TRAN_01			Camera	35	438104	6102805								Transect Line, Target NOT selected
26-Jul-2012	22:30:12	964	TB_TRAN_01			Camera	35	438111	6102810								Transect Line, Target NOT selected
26-Jul-2012	22:30:33	965	TB_TRAN_01			Camera	36	438118	6102816								Transect Line, Target NOT selected
26-Jul-2012	22:30:48	966	TB_TRAN_01			Camera	36	438122	6102820								Transect Line, Target NOT selected
26-Jul-2012	22:31:10	967	TB_TRAN_01			Camera	36	438127	6102826								Transect Line, Target NOT selected
26-Jul-2012	22:31:24	968	TB_TRAN_01			Camera	36	438130	6102830								Transect Line, Target NOT selected
26-Jul-2012	22:31:53	969	TB_TRAN_01			Camera	36	438136	6102838								Transect Line, Target NOT selected
26-Jul-2012	22:32:40	970	TB_TRAN_01			Camera	36	438148	6102852								Transect Line, Target NOT selected
26-Jul-2012	22:32:56	971	TB_TRAN_01			Camera	37	438152	6102857								Transect Line, Target NOT selected
26-Jul-2012	22:33:33	972	TB_TRAN_01			Camera	37	438161	6102868								Transect Line, Target NOT selected
26-Jul-2012	22:33:50	973	TB_TRAN_01			Camera	37	438167	6102873								Transect Line, Target NOT selected
26-Jul-2012	22:34:13	974	TB_TRAN_01			Camera	37	438174	6102880								Transect Line, Target NOT selected
26-Jul-2012	22:34:30	975	TB_TRAN_01			Camera	37	438179	6102884								Transect Line, Target NOT selected
26-Jul-2012	22:34:38	976	TB_TRAN_01			Camera	37	438182	6102887								Transect Line, Target NOT selected
26-Jul-2012	22:34:51	977	TB_TRAN_01			Camera	37	438186	6102890								Transect Line, Target NOT selected
26-Jul-2012	22:35:00	978	TB_TRAN_01			Camera	36	438190	6102894								Transect Line, Target NOT selected
26-Jul-2012	22:35:10	979	TB_TRAN_01			Camera	36	438193	6102896								Transect Line, Target NOT selected
26-Jul-2012	22:35:41	980	TB_TRAN_01			Camera	36	438202	6102906								Transect Line, Target NOT selected
26-Jul-2012	22:35:59	981	TB_TRAN_01			Camera	36	438208	6102911								Transect Line, Target NOT selected
26-Jul-2012	22:36:19	982	TB_TRAN_01			Camera	36	438212	6102916								Transect Line, Target NOT selected
26-Jul-2012	22:36:32	983	TB_TRAN_01			Camera	36	438215	6102919								Transect Line, Target NOT selected
26-Jul-2012	22:36:47	984	TB_TRAN_01			Camera	36	438218	6102923								Transect Line, Target NOT selected
26-Jul-2012	22:37:05	985	TB_TRAN_01			Camera	36	438222	6102927								Transect Line, Target NOT selected

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey																	Seafloor Sampling Positioning Summary
Job No	9180								Vessel	VIGILANT							
Client	Forewind Ltd								Vessel Reference Point (VRP)	CoG							
Project Name	Tranche B Benthic Survey								Deployment Location			x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1								Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)							
Geodetic Reference System	Datum	WGS84		Ellipsoid	WGS84					Projection	UTM ZONE 31 N (3E)				Vertical / Tidal Datum		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
26-Jul-2012	22:37:32	986	TB_TRAN_01			Camera	36	438230	6102936								Transect Line, Target NOT selected

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180					Vessel	Vigilant						
Client	Forewind Ltd					Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey					Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1					Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84		Ellipsoid	WGS84		Projection	UTM ZONE 31 N (3E)			Vertical / Tidal Datum		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
21-Jul-2012	11:34	1	TB_10	5L	Fauna/PSA	Mini Hamon Grab	29	446833	6098661	446851	6098655	-17.77	5.66	19	288		Low retention, conducting second sample
21-Jul-2012	11:48	2	TB_10	4L	NS	Mini Hamon Grab	29	446843	6098654	446851	6098655	-7.78	-0.52	8	266		Using first sample due to low retention
21-Jul-2012	12:23	3	TB_16	5L	Fauna/PSA	Mini Hamon Grab	29	445691	6097608	445732	6097606	-41.06	2.49	41	273		
21-Jul-2012	13:01	4	TB_30	4L	NS	Mini Hamon Grab	30	438954	6099859	438961	6099870	-7.22	-10.75	13	214		Low retention, conducting second sample
21-Jul-2012	13:08	5	TB_30	5L	Fauna/PSA	Mini Hamon Grab	29	438977	6099880	438961	6099870	16.16	9.67	19	59		
21-Jul-2012	13:48	6	TB_39	5L	Fauna/PSA	Mini Hamon Grab	31	439300	6103255	439328	6103252	-27.92	3.07	28	276		
21-Jul-2012	14:14	7	TB_48	5L	Fauna/PSA	Mini Hamon Grab	34	436715	6104322	436729	6104315	-14.01	7.38	16	298		Low retention, conducting second sample
21-Jul-2012	14:21	8	TB_48	2L	NS	Mini Hamon Grab	35	436750	6104322	436729	6104315	21.36	7.04	22	72		Stone in the jaws
21-Jul-2012	14:52	9	TB_21	5L	Fauna/PSA	Mini Hamon Grab	30	433786	6104928	433801	6104934	-14.70	-5.92	16	248		
21-Jul-2012	15:18	10	TB_46	5L	Fauna/PSA	Mini Hamon Grab	33	435132	6105632	435157	6105627	-25.16	4.65	26	280		
21-Jul-2012	21:26	11	TB_34	6L	Fauna/PSA	Mini Hamon Grab	32	447685	6106907	447675	6106904	9.88	3.37	10	71		
21-Jul-2012	22:02	12	TB_36	5L	Fauna/PSA	Mini Hamon Grab	31	445937	6106024	445923	6106013	14.37	11.22	18	52		
21-Jul-2012	22:23	13	TB_42	5L	Fauna/PSA	Mini Hamon Grab	32	445430	6106963	445443	6106978	-13.07	-14.61	20	222		
21-Jul-2012	22:52	14	TB_41	5L	Fauna/PSA	Mini Hamon Grab	33	443762	6106440	443762	6106432	-0.19	7.96	8	359		
21-Jul-2012	23:30	15	TB_33	4.5L	NS	Mini Hamon Grab	35	442656	6106600	442662	6106592	-6.38	7.96	10	321		Low retention, conducting second sample
21-Jul-2012	23:54	16	TB_33	5L	Fauna/PSA	Mini Hamon Grab	34	442650	6106620	442662	6106592	-11.82	27.97	30	337		
22-Jul-2012	06:39	17	TB_52	5L	Fauna/PSA	Mini Hamon Grab	38	459049	6106399	459048	6106393	0.66	6.06	6	6		
22-Jul-2012	07:03	18	TB_53	1L	PSA	Mini Hamon Grab	38	459326	6105728	459308	6105741	17.89	-13.34	22	127		
22-Jul-2012	07:16	19	TB_53	0L	NS	Mini Hamon Grab	38	459317	6105738	459308	6105741	9.34	-3.35	10	110		Grab damaged by tangled wire
22-Jul-2012	07:40	20	TB_53	0L	NS	Mini Hamon Grab	38	459310	6105732	459308	6105741	2.20	-9.18	9	167		Trigger failed
22-Jul-2012	07:47	21	TB_53	2.5L	Fauna	Mini Hamon Grab	38	459318	6105741	459308	6105741	9.58	0.38	10	88		Sample taken but low retention
22-Jul-2012	07:59	22	TB_53	-	NS	Mini Hamon Grab	38	459335	6105741	459308	6105741	26.52	-0.35	27	91		Stone in the jaws
22-Jul-2012	08:31	23	TB_49	4L	NS	Mini Hamon Grab	35	459964	6104487	459954	6104479	10.45	7.61	13	54		
22-Jul-2012	08:36	24	TB_49	3.5L	NS	Mini Hamon Grab	35	459969	6104486	459954	6104479	15.22	7.24	17	65		
22-Jul-2012	08:44	25	TB_49	7L	Fauna/PSA	Mini Hamon Grab	35	459974	6104483	459954	6104479	20.11	3.50	20	80		
22-Jul-2012	09:13	26	TB_44	4.5L	NS	Mini Hamon Grab	33	459562	6103707	459561	6103703	1.43	4.43	5	18		
22-Jul-2012	09:19	27	TB_44	5L	Fauna/PSA	Mini Hamon Grab	33	459559	6103712	459561	6103703	-1.55	9.26	9	350		
22-Jul-2012	09:55	28	TB_50	4L	NS	Mini Hamon Grab	35	455795	6102506	455792	6102516	2.68	-10.27	11	165		
22-Jul-2012	10:00	29	TB_50	7L	NS	Mini Hamon Grab	35	455781	6102494	455792	6102516	-11.08	-21.99	25	207		Stone in the jaws
22-Jul-2012	10:06	30	TB_50	5L	Fauna/PSA	Mini Hamon Grab	35	455786	6102515	455792	6102516	-5.80	-0.70	6	263		
22-Jul-2012	10:33	31	TB_35	5L	Fauna/PSA	Mini Hamon Grab	31	453306	6103804	453312	6103813	-5.84	-9.01	11	213		
22-Jul-2012	10:52	32	TB_38	4L	NS	Mini Hamon Grab	31	453291	6105516	453305	6105519	-13.88	-3.37	14	256		Low retention, conducting second sample
22-Jul-2012	10:58	33	TB_38	5L	Fauna/PSA	Mini Hamon Grab	31	453313	6105524	453305	6105519	8.22	5.25	10	57		
23-Jul-2012	22:41	34	TB_45	6L	Fauna/PSA	Mini Hamon Grab	28	465453	6104652	465452	6104648	0.97	4.09	4	13		
23-Jul-2012	23:26	35	TB_40	5L	PSA	Mini Hamon Grab	33	463430	6107117	463424	6107105	5.51	12.06	13	25		Low retention, conducting second sample
23-Jul-2012	23:33	36	TB_40	4L	Fauna	Mini Hamon Grab	33	463440	6107067	463424	6107105	15.74	-37.90	41	157		Low retention, conducting third sample
23-Jul-2012	23:38	37	TB_40	3L	NS	-	33	463417	6107078	463424	6107105	-7.45	-26.69	28	196		Using second sample due to low retention

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180				Vessel	Vigilant					
Client	Forewind Ltd				Vessel Reference Point (VRP)	CoG					
Project Name	Tranche B Benthic Survey				Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1				Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM ZONE 31 N (3E)			Vertical / Tidal Datum		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
24-Jul-2012	00:12	38	TB_51	4L	PSA	Mini Hamon Grab	36	464257	6108871	464243	6108856	13.97	14.98	20	43		Low retention, conducting second sample
24-Jul-2012	00:18	39	TB_51	3.5L	NS	-	38	464252	6108852	464243	6108856	8.99	-3.87	10	113		Low retention, conducting third sample
24-Jul-2012	00:23	40	TB_51	4.5L	Fauna	Mini Hamon Grab	36	464238	6108846	464243	6108856	-5.08	-9.53	11	208		
24-Jul-2012	00:58	41	TB_43	4L	NS	-	34	466808	6107005	466790	6106978	18.35	26.88	33	34		Low retention, conducting second sample
24-Jul-2012	01:05	42	TB_43	6L	Fauna/PSA	Mini Hamon Grab	34	466775	6106984	466790	6106978	-14.93	5.77	16	291		
24-Jul-2012	03:57	43	TB_37	6L	Fauna/PSA	Mini Hamon Grab	33	473873	6110683	473889	6110686	-15.59	-2.77	16	260		
24-Jul-2012	05:29	44	TB_20	5L	Fauna/PSA	Mini Hamon Grab	27	478647	6104416	478617	6104418	29.54	-2.05	30	94		
24-Jul-2012	06:48	45	TB_13	5L	PSA	Mini Hamon Grab	27	481917	6110325	481909	6110323	8.10	2.15	8	75		Low retention, conducting second sample
24-Jul-2012	06:54	46	TB_13	5L	Fauna	Mini Hamon Grab	28	481924	6110333	481909	6110323	15.40	10.10	18	57		
24-Jul-2012	09:27	47	TB_5	3.5L	NS	-	26	483490	6101845	483484	6101847	5.80	-2.01	6	109		Low retention, conducting second sample
24-Jul-2012	09:32	48	TB_5	4L	PSA	Mini Hamon Grab	26	483493	6101835	483484	6101847	8.74	-12.12	15	144		Low retention, conducting third sample
24-Jul-2012	09:36	49	TB_5	4.5L	Fauna	Mini Hamon Grab	25	483485	6101836	483484	6101847	0.92	-10.86	11	175		
24-Jul-2012	10:02	50	TB_1	5L	Fauna/PSA	Mini Hamon Grab	26	484392	6103135	484374	6103128	17.86	6.95	19	69		
24-Jul-2012	13:54	51	TB_14	5L	Fauna/PSA	Mini Hamon Grab	29	493201	6110128	493195	6110105	5.57	22.82	23	14		
24-Jul-2012	14:26	52	TB_29	5L	Fauna/PSA	Mini Hamon Grab	29	489664	6109621	489680	6109613	-15.65	8.16	18	298		
24-Jul-2012	14:56	53	TB_27	7L	Fauna/PSA	Mini Hamon Grab	28	490563	6106562	490582	6106559	-18.72	2.68	19	278		
24-Jul-2012	15:17	54	TB_8	6L	Fauna/PSA	Mini Hamon Grab	25	489382	6105967	489400	6105950	-17.67	16.69	24	313		
24-Jul-2012	18:51	55	TB_19	5L	Fauna/PSA	Mini Hamon Grab	27	500632	6109643	500638	6109644	-5.73	-0.72	6	263		
24-Jul-2012	19:59	56	TB_15	5L	Fauna/PSA	Mini Hamon Grab	28	503397	6110830	503391	6110814	5.66	16.42	17	19		
24-Jul-2012	20:44	57	TB_24	5L	Fauna/PSA	Mini Hamon Grab	29	498758	6112491	498748	6112490	10.04	0.89	10	85		
24-Jul-2012	22:27	58	TB_32	6L	Fauna/PSA	Mini Hamon Grab	29	494708	6102928	494690	6102945	17.79	-16.59	24	133		
25-Jul-2012	00:09	59	TB_23	5L	Fauna/PSA	Mini Hamon Grab	28	497527	6099569	497527	6099600	0.19	-31.21	31	180		
25-Jul-2012	01:27	60	TB_4	6L	Fauna/PSA	Mini Hamon Grab	23	501102	6094759	501102	6094764	0.11	-5.46	5	179		
25-Jul-2012	02:36	61	TB_9	6L	Fauna/PSA	Mini Hamon Grab	25	497157	6092494	497153	6092481	4.37	12.93	14	19		
25-Jul-2012	04:03	62	TB_3	7L	Fauna/PSA	Mini Hamon Grab	23	489764	6093220	489769	6093230	-5.32	-9.63	11	209		
25-Jul-2012	05:18	63	TB_6	5L	Fauna/PSA	Mini Hamon Grab	24	486761	6094289	486752	6094283	9.37	5.69	11	59		
25-Jul-2012	06:41	64	TB_2	8L	Fauna/PSA	Mini Hamon Grab	25	481904	6096500	481900	6096496	3.94	4.03	6	44		
25-Jul-2012	07:56	65	TB_7	<5L	NS	-	24	480315	6092344	480306	6092358	9.13	-13.92	17	147		Low retention, conducting second sample
25-Jul-2012	08:00	66	TB_7	4L	PSA	Mini Hamon Grab	24	480317	6092388	480306	6092358	10.53	30.08	32	19		Low retention, conducting third sample
25-Jul-2012	08:05	67	TB_7	4.5L	Fauna	Mini Hamon Grab	24	480296	6092357	480306	6092358	-9.93	-0.75	10	266		
25-Jul-2012	09:39	68	TB_18	3L	PSA	Mini Hamon Grab	29	476677	6099012	476679	6099015	-2.18	-2.81	4	218		Low retention, conducting second sample
25-Jul-2012	09:43	69	TB_18	5L	Fauna	Mini Hamon Grab	29	476682	6098993	476679	6099015	2.86	-22.44	23	173		
25-Jul-2012	10:53	70	TB_12	6L	Fauna/PSA	Mini Hamon Grab	29	472450	6097971	472422	6097946	27.73	25.20	37	48		
25-Jul-2012	11:50	71	TB_25	6L	Fauna/PSA	Mini Hamon Grab	29	470929	6096847	470927	6096848	2.49	-0.63	3	104		
25-Jul-2012	19:20	72	TB_26	6L	Fauna/PSA	Mini Hamon Grab	27	459673	6096887	459681	6096883	-8.23	4.49	9	299		
25-Jul-2012	19:40	73	TB_28	2L	NS	-	30	459169	6097126	459154	6097130	14.80	-3.74	15	104		
25-Jul-2012	19:47	74	TB_28	3L	NS	-	30	459154	6097120	459154	6097130	-0.12	-9.61	10	181		
25-Jul-2012	19:50	75	TB_28	5L	Fauna/PSA	Mini Hamon Grab	30	459142	6097093	459154	6097130	-12.39	-36.84	39	199		
25-Jul-2012	20:11	76	TB_22	8L	Fauna/PSA	Mini Hamon Grab	28	457218	6096101	457215	6096139	2.69	-38.50	39	176		
25-Jul-2012	20:37	77	TB_11	7L	Fauna/PSA	Mini Hamon Grab	30	455552	6093332	455520	6093366	31.97	-33.88	47	137		
25-Jul-2012	20:59	78	TB_17	6L	Fauna/PSA	Mini Hamon Grab	30	453445	6093358	453425	6093378	20.28	-19.82	28	134		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9180			Vessel	VIGILANT						
Client	Forewind Ltd			Vessel Reference Point (VRP)	CoG						
Project Name	Tranche B Benthic Survey			Deployment Location		x	-7.34	y	19.31	z	0
Primary Positioning System	Prime Nav: BD950_1			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM ZONE 31 N (3E)		Vertical / Tidal Datum			

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
25-Jul-2012	22:10	1	TB_CHEM_17	50%	SED PAH HC	Day Grab	30	453425	6093390	453425	6093390	0.50	0.19	12	358		
25-Jul-2012	22:23	2	TB_CHEM_17A	10%	NS	-	30	453427	6093393	453425	6093390	-2.28	-3.51	4	33		Stone in jaw
25-Jul-2012	22:29	3	TB_CHEM_17A	-	NS	-	30	453431	6093394	453425	6093390	-6.79	-4.27	8	58		Triggered in water column
25-Jul-2012	22:34	4	TB_CHEM_17A	50%	SOL PAH HC Spare	Day Grab	30	453429	6093390	453425	6093390	-4.44	-0.40	4	85		
25-Jul-2012	23:41	5	TB_CHEM_10	50%	SED PAH HC	Day Grab	30	446885	6098682	446851	6098655	-34.49	-26.56	44	52		
26-Jul-2012	00:00	6	TB_CHEM_10A	60%	SOL PAH HC Spare	Day Grab	30	446888	6098674	446851	6098655	-36.56	-19.35	8	164		
26-Jul-2012	00:45	7	TB_CHEM_33	60%	SED PAH HC	Day Grab	34	442681	6106603	442662	6106592	-19.03	-10.52	22	61		
26-Jul-2012	01:07	8	TB_CHEM_33A	50%	SOL PAH HC Spare	Day Grab	34	442682	6106596	442662	6106592	-19.54	-3.85	7	176		
26-Jul-2012	01:37	9	TB_CHEM_36	50%	SED PAH HC	Day Grab	31	445935	6106004	445923	6106013	-12.20	9.22	15	127		
26-Jul-2012	01:58	10	TB_CHEM_36A	-	NS	-	31	445922	6106006	445923	6106013	0.61	7.10	13	279		Low Retention
26-Jul-2012	02:03	11	TB_CHEM_36A	50%	SOL PAH HC Spare	Day Grab	31	445937	6106009	445923	6106013	-13.64	3.58	6	14		
26-Jul-2012	03:04	12	TB_CHEM_40	50%	SED PAH HC	Day Grab	33	463411	6107099	463424	6107105	12.73	6.30	14	244		
26-Jul-2012	03:14	13	TB_CHEM_40A	50%	SOL PAH HC Spare	Day Grab	33	463406	6107097	463424	6107105	18.04	8.04	6	252		
26-Jul-2012	04:19	14	TB_CHEM_13	50%	SED PAH HC	Day Grab	26	481909	6110327	481909	6110323	-0.43	-3.52	4	7		
26-Jul-2012	04:30	15	TB_CHEM_13A	50%	SOL PAH HC Spare	Day Grab	26	481908	6110330	481909	6110323	1.27	-6.93	4	333		
26-Jul-2012	05:02	16	TB_CHEM_1	50%	SED PAH HC	Day Grab	25	484368	6103123	484374	6103128	6.20	5.50	8	228		
26-Jul-2012	05:10	17	TB_CHEM_1A	50%	SOL PAH HC Spare	Day Grab	25	484364	6103122	484374	6103128	9.58	6.28	3	257		
26-Jul-2012	06:33	18	TB_CHEM_19	50%	SED PAH HC	Day Grab	27	500616	6109651	500638	6109644	21.59	-7.08	23	288		
26-Jul-2012	06:39	19	TB_CHEM_19A	50%	SOL PAH HC Spare	Day Grab	27	500621	6109655	500638	6109644	16.77	-10.76	6	53		
26-Jul-2012	09:31	20	TB_CHEM_4	-	NS	-	24	501122	6094772	501102	6094764	-19.86	-7.81	21	69		Low Retention
26-Jul-2012	09:34	21	TB_CHEM_4	50%	SED PAH HC	Day Grab	24	501136	6094760	501102	6094764	-34.37	4.27	35	97		
26-Jul-2012	09:40	22	TB_CHEM_4A	50%	SOL PAH HC Spare	Day Grab	24	501142	6094758	501102	6094764	-39.89	6.37	6	111		
26-Jul-2012	12:15	23	TB_CHEM_6	50%	SED PAH SED HC	Day Grab	24	486772	6094278	486752	6094283	-19.80	5.15	20	105		
26-Jul-2012	12:37	24	TB_CHEM_6A	40%	Spare SOL PAH HC	Day Grab	24	486773	6094274	486752	6094283	-20.57	9.37	4	170		
26-Jul-2012	13:38	25	TB_CHEM_25	40%	Spare SOL PAH HC	Day Grab	28	470932	6096850	470927	6096848	-5.41	-1.91	6	71		
26-Jul-2012	13:46	26	TB_CHEM_25A	60%	SED PAH SED HC	Day Grab	28	470924	6096852	470927	6096848	2.76	-4.13	8	285		

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

SEABED IMAGERY LOG SHEET (Deck)				QPRO-0753
Job No: 9180	**Area:** Dogger Bank	**Vessel:** Vigilant	**Operator:** DG/AH/JG IS/JG/TR	
Date: from: 26-Jul-12 to: 26-07-12	**Page:** 1 of 2	**Client:** Forewind Ltd	**Scale bar:** 1cm	
Project: Tranche B Benthic Survey			**Equipment:** Shallow Water camera system	

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
DATE: 26-Jul-2012 Wx N, 3, 0.5m									
1	TB_TRAN_07	08:07	21	1	00:00	Potential stony reef habitat, with boulders, cobbles, gravel patches of coarse sand with abundant shell fragments. Observed fauna: Pleuronectiformes, *Flustra* sp., Asteroidea, *Asterias rubens, Alcyonium digitatum*		32	627-675
		08:21	6		14:00				
2	TB_TRAN_08	10:40	21	2	00:00	Fine - medium sand with shell fragments some gravel and pebbles, occasional large cobble, faunal burrows (12mins). Observed fauna: *Alcyonium digitatum, Asterias rubens*		40	658-695
		11:09	6		23:33				
3	TB_TRAN_09	14:21	22	1	00:00	Patchy sand with gravel, cobbles and boulders. Observed fauna: Asteroidea, *Alcyonium digitatum*, Brachyura, Porifera, Hydrozoa		56	696-750
		14:45	6		24:02				
4	TB_TRAN_05	16:18	22	2	00:00	Patchy sand with gravel, cobbles and boulders. Observed fauna: *Alcyonium digitatum*, Asteroidea, *Echinus* sp., *Flustra* sp., Ophiuroidea, Brachyura		30	751-779
		16:34	6		18:16				
5	TB_TRAN_06	17:34	23	1	00:00	Patchy sand with gravel, cobbles and boulders. Observed fauna: *Alcyonium digitatum*, Porifera, Asteroidea, *Cancer pagurus* and other Brachyura, Ophiuroidea		32	780-810
		17:49	6		14:00				
6	TB_TRAN_04	18:43	23	2	00:00	Patchy sand with gravel, cobbles and boulders. Observed fauna: *Alcyonium digitatum*, Porifera, Echinoidea, Hydrozoa, and lots of Ophiuroidea		45	811-854
		18:59	6		15:57				
7	TB_TRAN_03	19:32	23	3	00:00	Patchy sand with gravel, cobbles and boulders. Observed fauna: *Alcyonium digitatum,* Asteroidea, Ophiuroidea, *Cancer Pagurus*		40	855-895
		19:58	6		26:26				

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

SEABED IMAGERY LOG SHEET (Deck)									QPRO-0753
Job No: 9180		**Area:** Dogger Bank		**Vessel:** Vigilant			**Operator:** DG/AH/JG		IS/JG/TR
Date: from: 26-Jul-12 to: 26-07-12		**Page:** 2 of 2		**Client:** Forewind Ltd			**Scale bar:**		1cm
Project: Tranche B Benthic Survey							**Equipment:** Shallow Water camera system		
Sample Number	**Station Number**	**Time on overlay**	**DVD/ Video No**	**DVD Chapter**	**Counter (start & end)**	**Sediment Description**	**Comments**	**TOT FIXES**	**FIXES Nos**
8	TB_TRAN_02	20:46	24	1	00:00	Patchy sand with gravel, cobbles and boulders. Observed fauna: Flounder, *Spirobranchus* sp., Asteroidea.	Overlay says 03. No fix in the middle of footage.	63	896-955
		21:04	6+7		21:00				
9	TB_TRAN_01	22:26	24	2	00:00	Sand and gravel, patches of cobbles. Observed fauna*Alcyonium digitatum* , Brachyura, Asteroidea, Echinoidea, Porifera, Pleuronectiformes		32	956-986
		22:37	7		11:10				

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9180		**Area:** Dogger Bank		**Vessel:** Vigilant		**Operator:** IS, JGr, TR, DG, AH, Jga	
Date: from: 17-07-2012 to: 25-07-2012		**Page:** 1 of 8		**Client:** Forewind Ltd		**Sieve Size:** 1mm	
Project: Tranche B Benthic Survey						**Equipment:** Mini Hamon Grat	
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
Date: 21-Jul-12 SE, 3, 1.5m							
1	TB_10	11:34	5L	Fauna/PSA	-	Compact fine Sand. Greyish green/brown colour. Shell fragments and a small pebble after sieving. Munsel chart 2.5Y 5/2. Observed fauna: Polchaeta	Attempted a second grab to get a higher retention
2	TB_10	11:48	4L	N/S	-	No sample	Low retention
3	TB_16	12:23	5L	Fauna/PSA	-	Compact fine Sand. Greyish/brown colour. Lots of shell fragments after sieving. Munsel chart 2.5Y 5/2. Observed fauna: Echinocardium chordatum	
4	TB_30	13:01	4L	N/S	-	No sample	Low retention
5	TB_30	13:08	5L	Fauna/PSA	-	Compact fine Sand with gravel, pebbles, cobbles and shell fragments. Sediment Grey brown in colour. Munsel chart 2.5Y 4/2. Observed fauna: Polychaeta, Nephtys sp.	
6	TB_39	13:48	5L	Fauna/PSA	-	Compact fine Sand, grey/brown in colour with shell fragments. Munsel chart 2.5Y 4/1. Very small amount of shell fragments and fauna after sieving. Observed fauna: Polychaeta, Ophiuridae.	
7	TB_48	14:14	5L	Fauna/PSA	-	Gravel with pebbles and cobbles very little Sand. Munsel chart 2.5Y 4/2. Observed fauna: Polychaeta	Attempted a second grab to get higher retention
8	TB_48	14:21	2L	N/S	-	No sample	Stone trapped in the jaws
9	TB_21	14:52	5L	Fauna/PSA	-	Compact fine Sand, Grey/brown in colour. Munsel chart 2.5Y 4/2	
10	TB_46	15:18	5L	Fauna/PSA	-	Compact fine Sand, Grey/brown in colour. Munsel chart 2.5Y 4/2. Observed fauna: Echinocardium chordatum and Polychaeta	
11	TB_34	21:26	6L	Fauna/PSA	-	Compact fine Sand, dark olive brown in colour with shell fragments. Munsel chart 2.5Y 3/3 Small amount of shell and fauna after sieving. Observed fauna: Polychaete tubes	

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9180		**Area:** Dogger Bank		**Vessel:** Vigilant			**Operator:** IS, JGr, TR, DG, AH, Jga
Date: from: 17-07-2012 to: 25-07-2012		**Page:** 2 of 8		**Client:** Forewind Ltd			**Sieve Size:** 1mm
Project: Tranche B Benthic Survey							**Equipment:** Mini Hamon Grab
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
12	TB_36	22:02	5L	Fauna/PSA	-	Compact fine Sand, dark Greyish brown with shell fragments. Munsel chart 2.5Y 4/2. Small amount of shell and fauna after sieving. Observed fauna: Polychaeta	
13	TB_42	22:23	5L	Fauna/PSA	-	Compact fine Sand, very dark Greyish brown in colour with shell fragments. Munsel chart 2.5Y 3/2.Observed fauna: Polychaeta	
14	TB_41	22:52	5L	Fauna/PSA	-	Compact fine Sand, dark Greyish brown with shell fragments. Munsel chart 2.5Y 4/2. Small amount of shells and fauna after sieving. Observed fauna: Polychaeta	
15	TB_33	23:30	4.5L	N/S	-	No sample	Low retention
16	TB_33	23:54	5L	Fauna/PSA	-	Fine to medium compact Sand, no odour, shell fragments and some fines (Silt).Observed fauna: Ensis Ensis, Corystes cassivelaunus, Polychaeta	
Date: 22-Jul-12 Wx: SSW, 5, 1m							
17	TB_52	06:39	5L	Fauna/PSA	-	Fine to medium compact Sand-no odour some fines (silt), some small shells. Munsel chart 2.5Y 3/3. Observed fauna: Polychaeta	
18	TB_53	07:03	1L	PSA	-	Medium to coarse Sand with gravel, pebbles and cobbles and shell fragments. Munsel chart 2.5Y 4/1	PSA was taken from this sample as all other samples were too small to process both the fauna and PSA
19	TB_53	07:16	0L	N/S	-	No sample	Hamon grab damaged, Please see relevant EMRF
20	TB_53	07:40	0L	N/S	-	No sample	Grab did not trigger
21	TB_53	07:47	2.5L	Fauna	-	Gravel with pebbles and cobbles. Munsel chart 2.5Y 4/1	
22	TB_53	07:59		N/S	-	No sample	Stone trapped in jaw and sample washed out

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

SEABED SAMPLING LOG SHEET (Deck)			QPRO-0755
Job No: 9180	**Area:** Dogger Bank	**Vessel:** Vigilant	**Operator:** IS, JGr, TR, DG, AH, Jga
Date: from: 17-07-2012 to: 25-07-2012	**Page:** 3 of 8	**Client:** Forewind Ltd	**Sieve Size:** 1mm
Project: Tranche B Benthic Survey			**Equipment:** Mini Hamon Grab

Sample Number	Station Number	Time	Load	Retention	Sieving Comments	Sediment Description	Comments
23	TB_49	08:31	4L	N/S	-	No sample	Low retention
24	TB_49	08:36	3.5L	N/S	-	No sample	Stone trapped in jaw and sample washed out
25	TB_49	08:44	7L	Fauna/PSA	-	Olive-grey, compact fine to medium Sand with gravel, pebbles, cobbles and shell fragments. Munsel chart 2.5Y 4/3. Observed fauna: Ophiuroidea, Echinoidea, Alcyonium digitatum, Polychaeta, Spirobranchus sp., Echinus esculentus, Bryozoa	
26	TB_44	09:13	4.5L	N/S	-	No sample	Low retention
27	TB_44	09:19	5L	Fauna/PSA	-	Compact fine to medium Sand with shell fragments. Dark olive brown in colour. Munsel chart 2.5Y 3/3.Observed fauna: Serpulidae, Nereididae	
28	TB_50	09:55	4L	N/S	-	No sample	Low retention
29	TB_50	10:00	7L	N/S	-	No sample	Stone trapped in jaw and sample washed out
30	TB_50	10:06	5L	Fauna/PSA	-	Compact fine to medium and coarse Sand with gravel, pebbles, cobbles and shell fragments. Munsel chart 2.5Y 5/4. Observed fauna: Spirobranchus sp., Echinus esculentus	
31	TB_35	10:33	5L	Fauna/PSA	-	Compact fine to medium Sand with a few small shell fragments. Munsel chart 2.5Y 3/1. Observed fauna: Serpulidae	
32	TB_38	10:52	4L	N/S	-	No sample	Low retention
33	TB_38	10:58	5L	Fauna/PSA	-	Compact fine Sand with shell fragments, dark Greyish brown in colour. Munsel chart 2.5Y 4/2. Observed fauna: Polchaeta, Scaphopoda, Bivalvia	

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9180		**Area:** Dogger Bank		**Vessel:** Vigilant			**Operator:** IS, JGr, TR, DG, AH, Jga
Date: from: 17-07-2012 to: 25-07-2012		**Page:** 4 of 8		**Client:** Forewind Ltd			**Sieve Size:** 1mm
Project: Tranche B Benthic Survey							**Equipment:** Mini Hamon Grat
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
Date: 23-Jul-12 Wx: S, 4-5, 1-1.5m							
34	TB_45	22:40	6L	Fauna/PSA	-	Fine compact Sand with some shell fragments dark greyish brown. 2.5Y 4/2.	
35	TB_40	23:26	5L	PSA	-	Compact fine Sand with some shell fragments. Dark Greyish brown in colour. Munsel 2.5Y 4/2	
36	TB_40	23:33	4L	Fauna	-	Compact fine Sand with some shell fragments. Dark olive brown in colour. Munsel chart 2.5Y 3/3. Observed fauna: Polychaeta	
37	TB_40	23:38	N/S	3L	-	No sample	PSA was taken from a different sample from the fauna
Date: 24-Jul-12 Wx: SW, 4, 1.5m							
38	TB_51	00:12	4L	PSA	-	Compact fine Sand with occassional shell fragments. Some fines (silt). Very dark Greyish in colour. Munsel chart 2.5Y 3/2	
39	TB_51	00:18	3.5L	N/S	-	No sample	Low retention
40	TB_51	00:23	4.5L	Fauna	-	Compact fine Sand with occassional shell fragments. Some fines (silt). Very dark Greyish in colour. Munsel chart 2.5Y 3/2. Observed fauna: Polychaete tubes, Echinocardium sp.	
41	TB_43	00:58	4L	N/S	-	No sample	Low retention
42	TB_43	01:05	6L	Fauna/PSA	-	Compact fine Sand with occassional shell fragments. Dark olive brown in colour. Munsel chart 2.5Y 3/3. Observed fauna: Polychaeta	
43	TB_37	03:57	6L	Fauna/PSA	-	Compact fine to medium Sand with shell fragments. Olive brown in colour. Munsel chart 2.5Y 4/3. Observed fauna: Echinocardium sp.	

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9180		**Area:** Dogger Bank		**Vessel:** Vigilant			**Operator:** IS, JGr, TR, DG, AH, Jga
Date: from: 17-07-2012 to: 25-07-2012		**Page:** 5 of 8		**Client:** Forewind Ltd			**Sieve Size:** 1mm
Project: Tranche B Benthic Survey							**Equipment:** Mini Hamon Grat
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
44	TB_20	05:29	5L	Fauna/PSA	-	Compact fine to medium Sand with shell fragments, light olive brown in colour. Munsel chart 2.5Y 5/4. Observed fauna : Bivalvia	
45	TB_13	06:48	5L	PSA	-	Compact fine to medium Sand with occassional shell fragments. Munsel chart 2.5Y 4/1.	
46	TB_13	06:54	5L	Fauna	-	Compact fine to medium Sand with occassional shell fragments. Munsel chart 2.5Y 4/1. Observed fauna: Echinocardium sp.	
47	TB_5	09:27	3.5L	N/S	-	No sample	Low retention
48	TB_5	09:32	4L	PSA	-	Compact fine to medium Sand with shell fragments. Dark Greyish brown in colour. Munsel chart 2.5Y 4/2.	
49	TB_5	09:36	4.5L	Fauna	-	Compact fine to medium Sand with shell fragments. Dark Greyish brown in colour. Munsel chart 2.5Y 4/2. Observed fauna: Bivalvia and Echinocardium sp.	
50	TB_1	10:02	5L	Fauna/PSA	-	Compact fine to medium Sand with shell fragments. Dark olive brown in colour. Munsel chart 2.5Y 3/3. Observed fauna: Echinocardium sp., Lanice conchilega, Serpulidae	
51	TB_14	13:54	5L	Fauna/PSA	-	Compact fine Sand with shell fragments, olive brown in colour. Munsel chart 2.5Y 4/3. Observed fauna: Echinocardium sp., Bivalvia, Polychaeta	
52	TB_29	14:26	5L	Fauna/PSA	-	Compact fine Sand with shell fragments, dark Greyish brown in colour. Munsel chart 2.5Y 4/2. Observed fauna: Polychaeta , Nephtys sp.	
53	TB_27	14:56	7L	Fauna/PSA	-	Copmpact fine Sandwith shell fragments, very dark Greyish brown. Munsel chart 2.5Y 3/2 Observed fauna: Polychaeta	
54	TB_8	15:17	6L	Fauna/PSA	-	Compact fine Sand with shell fragments. Munsel chart 2.5Y 4/2	

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9180		**Area:** Dogger Bank		**Vessel:** Vigilant			**Operator:** IS, JGr, TR, DG, AH, Jga
Date: from: 17-07-2012 to: 25-07-2012		**Page:** 6 of 8		**Client:** Forewind Ltd			**Sieve Size:** 1mm
Project: Tranche B Benthic Survey							**Equipment:** Mini Hamon Grat
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
55	TB_19	18:51	5L	Fauna/PSA	-	Compact fine Sand with lots of shell fragments, dark Greyish brown in colour. Munsel chart 2.5Y 4/2. Observed fauna: Polychaeta, Bivalvia, Ensis ensis	
56	TB_15	19:59	5L	Fauna/PSA	-	Compact fine Sand with shell fragments, olive brown in colour. Munsel chart 2.5Y 4/3. Observed fauna: Bivalvia, Actiniaria, Polychaeta	
57	TB_24	20:44	5L	Fauna/PSA	-	Compact fine Sand with shell fragments, dark olive brown in colour. Munsel chart 2.5Y 3/3	
58	TB_32	22:27	6L	Fauna/PSA	-	Compact fine Sand, slightly anoxic with shell fragments. Very dark Grey. Munsel chart 2.5Y 3/1	
Date: 25-Jul-12 Wx: Light air, 0.5m							
59	TB_23	00:09	5L	Fauna/PSA	-	Compact fine Sand with occassional shell fragments, dark olive brown. Munsel chart 2.5Y 3/3. Observed fauna: Echinocardium sp., Ensis ensis, Annelida	
60	TB_4	01:27	6L	Fauna/PSA	-	Sand, compact, fine to medium, with occasional shell fragments some dark organic streaks in sediments 2.5 Y 4/1	
61	TB_9	02:36	6L	Fauna/PSA	-	Sand, fine to medium stiff compact Sand occasional shell fragments 2.5 Y 4/1. Observed fauna: Serpulidae	
62	TB_3	04:03	7L	Fauna/PSA	-	Sand, fine to medium compact Sand, dark greyish brown, occasional shell fragments 2.5Y 4/2. Observed fauna: Ammotodytes sp., Ophiuroidea, Polychaeta	
63	TB_6	05:18	5L	Fauna/PSA	-	Sand, fine to medium Sand with many shell fragments, dark grey 2.5Y 4/1	
64	TB_2	06:41	8L	Fauna/PSA	-	Sand, fine med stiff Sand with many shell fragments, dark greyish brown 2.5Y 4/2. Observed fauna: Ensis ensis, Echinocardium sp., Ammodytes sp., Bivalvia	
65	TB 7	07:56	<5L	N/S	-	No sample	Low retention

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9180		**Area:** Dogger Bank		**Vessel:** Vigilant			**Operator:** IS, JGr, TR, DG, AH, Jga
Date: from: 17-07-2012 to: 25-07-2012		**Page:** 7 of 8		**Client:** Forewind Ltd			**Sieve Size:** 1mm
Project: Tranche B Benthic Survey							**Equipment:** Mini Hamon Grat
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
66	TB 7	08:00	4L	PSA	-	Very fine - medium stiff Sand, many shell fragments. Darkish grey - brown. 2.5Y 4/2. Observed fauna: Ensis ensis, Echinocardium sp., Mollusca, Bivalvia	
67	TB 7	08:05	4.5L	Fauna	-	Observed fauna: *Lanice conchilega*, Serpulidae, *Echinocardium* sp., *Ensis ensis*	
68	TB 18	09:39	3L	PSA	-	Fine - medium compact Sand. Shell fragments, some organic element, muddy smell. 2.5Y 4/1	
69	TB 18	09:43	5L	Fauna	-	Fine - medium Sand with shell fragments. Observed fauna: Echinocardium sp.	
70	TB 12	10:53	6L	Fauna/PSA	-	Fine - medium Sand. Dark greyish brown. 2.5Y 4/2	
71	TB 25	11:50	6L	Fauna/PSA	-	Fine - medium Sand. Some anoxic sediment. Very dark grey, shell fragments. 2.5Y 3/1	
72	TB_26	19:20	6L	Fauna/PSA	-	Fine - medium compact Sand. Shell fragments, some anoxic sediment. Very dark Greyish brown. Munsel chart 2.5Y 3/2. Observed fauna: *Echinocardium* sp. Polychaeta and *Nephtys* sp.	
73	TB_28	19:40	2L	N/S	-	No sample	Low retention
74	TB_28	19:47	3L	N/S	-	No sample	Gravel and some pebbles in jaws
75	TB_28	19:50	5L	Fauna/PSA	-	Fine- medium compact Sand. Shell fragments, dark olive brown, Munsel chart 2.5Y 3/3. Observed fauna: *Echinocardium* sp., juvenile *Liocarcinus* sp. and juvenile *Corystes cassivelaunus, Decapoda*, Polychaeta, Bivalvia	
76	TB_22	20:11	8L	Fauna/PSA	-	Fine- medium compact Sand. Shell fragments with anoxic sediment and odour. Very dark Grey in colour. Munsel chart 2.5Y 3/3. Observed fauna: *Echinocardium* sp. Polychaeta, Bivalvia	

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9180		**Area:** Dogger Bank		**Vessel:** Vigilant			**Operator:** IS, JGr, TR, DG, AH, Jga
Date: from: 17-07-2012 to: 25-07-2012		**Page:** 8 of 8		**Client:** Forewind Ltd			**Sieve Size:** 1mm
Project: Tranche B Benthic Survey							**Equipment:** Mini Hamon Grat
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
77	TB_11	20:37	7L	Fauna/PSA	-	Fine - medium compact Sand. Shell fragments, some anoxic sediment and odour. Dark Greyish brown. Munsel chart 2.5Y 4/2. Observed fauna:*Echinocardium* sp. juvenile *Corystes cassivalaunus* , Polychaeta	
78	TB_17	20:59	6L	Fauna/PSA	-	Fine- medium compact Sand, with some anoxic sediment and lots of shell fragments. Dark Greyish brown. Munsel chart 2.5Y 4/2. Observed fauna:*Echinocardium* sp., Polychaeta	

APPENDIX A - FIELD SAMPLING LOGS

Tranche B

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9180		**Area:** Dogger Bank		**Vessel:** Vigilant			**Operator:** IS, JGr, TR, DG, AH, JGa
Date: from: 25-Jul-12 to: 26-Jul-12		**Page:** 1 of 3		**Client:** Forewind Ltd			**Sieve Size:** NA
Project: Tranche B Benthic Survey							**Equipment:** Day Grab
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
Date: 25-Jul-12 Wx Light air 0.5m							
1	TB_CHEM_17	22:10	50%	SED PAH HC	-	Fine medium compact sand with shell fragments	EA-1994637
2	TB_CHEM_17	22:23	10%	NS	-	Fine medium compact sand with shell fragments	Low retention
3	TB_CHEM_17	22:29	0%	NS	-	Fine medium compact sand with shell fragments	Grab full of water. May have triggered in water column.
4	TB_CHEM_17	22:34	50%	SOL PAH HC Spare	-	Fine medium compact sand with shell fragments	EA-1994637
5	TB_CHEM_10	23:41	50%	SED PAH HC	-	Fine medium compact sand with shell fragments	EA-1994639
Date: 26-Jul-12 Wx N, 3, 0.5m							
6	TB_CHEM_10	00:00	60%	SOL PAH HC Spare	-	Fine medium compact sand with shell fragments and tube worms	EA-1994639
7	TB_CHEM_33	00:45	60%	SED PAH HC	-	Fine medium compact sand with shell fragments	EA-1994640
8	TB_CHEM_33	01:07	50%	SOL PAH HC Spare	-	Fine to medium compact sand with shell fragments	EA-1994640
9	TB_CHEM_36	01:37	50%	SED PAH HC	-	Fine to medium compact sand with shell fragments	EA-1994641
10	TB_CHEM_36	01:58	<20%	NS	-	No sample	No sample, stone in jaws, sample washed out
11	TB_CHEM_36	02:03	50%	SOL PAH HC Spare	-	Fine to medium compact stiff sand with shell fragments	EA-1994641

APPENDIX A - FIELD SAMPLING LOGS
Tranche B

SEABED SAMPLING LOG SHEET (Deck)			QPRO-0755
Job No: 9180	**Area:** Dogger Bank	**Vessel:** Vigilant	**Operator:** IS, JGr, TR, DG, AH, JGa
Date: from: 25-Jul-12 to: 26-Jul-12	**Page:** 2 of 3	**Client:** Forewind Ltd	**Sieve Size:** NA
Project: Tranche B Benthic Survey			**Equipment:** Day Grab

Sample Number	Station Number	Time	Load	Retention	Sieving Comments	Sediment Description	Comments
12	TB_CHEM_40	03:04	50%	SED PAH HC	-	Fine to medium compact stiff sand with shell fragments	EA-1994642
13	TB_CHEM_40	03:14	50%	SOL PAH HC Spare	-	Fine to medium compact stiff sand with shell fragments	EA-1994642
14	TB_CHEM_13	04:19	50%	SED PAH HC	-	Fine to medium stiff sand with shell fragments	EA-1994643
15	TB_CHEM_13	04:30	50%	SOL PAH HC Spare	-	Fine to medium stiff sand with shell fragments	EA-1994643
16	TB_CHEM_1	05:02	50%	SED PAH HC	-	Fine to medium stiff sand with shell fragments	EA-1994644
17	TB_CHEM_1	05:10	50%	SOL PAH HC Spare	-	Fine to medium stiff sand with shell fragments	EA-1994644
18	TB_CHEM_19	06:33	50%	SED PAH HC	-	Fine to medium stiff sand with shell fragments	EA-1994645
19	TB_CHEM_19	06:39	50%	SOL PAH HC Spare	-	Fine to medium stiff sand with shell fragments	EA-1994645
20	TB_CHEM_4	09:31	0%	NS	-	No sample	Grab miss fired in water column
21	TB_CHEM_4	09:34	50%	SED PAH HC	-	Fine to medium stiff sand with shell fragments	EA-1994646
22	TB_CHEM_4	09:39	50%	SOL PAH HC Spare	-	Fine to medium stiff sand with shell fragments	EA-1994646

APPENDIX A - FIELD SAMPLING LOGS

Tranche B

SEABED SAMPLING LOG SHEET (Deck)			QPRO-0755
Job No: 9180	**Area:** Dogger Bank	**Vessel:** Vigilant	**Operator:** IS, JGr, TR, DG, AH, JGa
Date: from: 25-Jul-12 to: 26-Jul-12	**Page:** 3 of 3	**Client:** Forewind Ltd	**Sieve Size:** NA
Project: Tranche B Benthic Survey			**Equipment:** Day Grab

Sample Number	Station Number	Time	Load	Retention	Sieving Comments	Sediment Description	Comments
23	TB_CHEM_6	12:15	50%	SED PAH SED HC	-	Fine to medium sand compact with shell fragments	EA-1994647
24	TB_CHEM_6	12:37	40%	Spare SOL PAH HC	-	Fine to medium compact sand with shell fragments, dark olive brown	EA-1994647
25	TB_CHEM_25	13:38	40%	Spare SOL PAH HC	-	Fine to medium compact sand with shell fragments, dark olive brown	EA-1994648
26	TB_CHEM_25	13:46	60%	SED PAH SED HC	-	Fine to medium compact sand with shell fragments, dark olive brown	EA-1994648

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant						
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG						
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT	

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
20-Sep-2012	19:16	1	TCC_CAM_15			Freshwater lens camera	61	254822	6069867	254815	6069875	-6.42	8.46	11	143	SKA	
20-Sep-2012	19:17	2	TCC_CAM_15			Freshwater lens camera	61	254833	6069858	254815	6069875	-17.43	17.86	25	136	SKA	
20-Sep-2012	19:17	3	TCC_CAM_15			Freshwater lens camera	61	254833	6069858	254815	6069875	-17.90	17.92	25	135	SKA	
20-Sep-2012	19:18	4	TCC_CAM_15			Freshwater lens camera	61	254842	6069871	254815	6069875	-26.67	4.52	27	100	SKA	
20-Sep-2012	19:20	5	TCC_CAM_15			Freshwater lens camera	61	254838	6069868	254815	6069875	-22.47	7.06	24	107	SKA	
20-Sep-2012	19:22	6	TCC_CAM_15			Freshwater lens camera	61	254838	6069880	254815	6069875	-22.94	-4.41	23	79	SKA	
20-Sep-2012	19:23	7	TCC_CAM_15			Freshwater lens camera	61	254849	6069858	254815	6069875	-33.68	17.37	38	117	SKA	
20-Sep-2012	19:25	8	TCC_CAM_15			Freshwater lens camera	61	254822	6069873	254815	6069875	-6.10	1.96	6	108	SKA	
20-Sep-2012	19:26	9	TCC_CAM_15			Freshwater lens camera	61	254808	6069861	254815	6069875	7.82	14.92	17	208	SKA	
20-Sep-2012	19:29	10	TCC_CAM_15			Freshwater lens camera	61	254825	6069874	254815	6069875	-9.38	1.01	9	96	SKA	
20-Sep-2012	19:30	11	TCC_CAM_15			Freshwater lens camera	61	254823	6069881	254815	6069875	-7.95	-5.43	10	56	SKA	
20-Sep-2012	19:32	12	TCC_CAM_15			Freshwater lens camera	61	254815	6069863	254815	6069875	0.18	12.62	13	181	SKA	
20-Sep-2012	20:08	13	TCC_CAM_16			Freshwater lens camera	61	255581	6069225	255578	6069213	-3.06	-11.23	12	15	SKA	
20-Sep-2012	20:08	14	TCC_CAM_16			Freshwater lens camera	61	255581	6069225	255578	6069213	-3.78	-11.69	12	18	SKA	
20-Sep-2012	20:09	15	TCC_CAM_16			Freshwater lens camera	61	255583	6069233	255578	6069213	-4.92	-19.80	20	14	SKA	
20-Sep-2012	20:11	16	TCC_CAM_16			Freshwater lens camera	61	255581	6069235	255578	6069213	-3.73	-21.47	22	10	SKA	
20-Sep-2012	20:12	17	TCC_CAM_16			Freshwater lens camera	61	255589	6069242	255578	6069213	-11.17	-28.31	30	22	SKA	
20-Sep-2012	20:14	18	TCC_CAM_16			Freshwater lens camera	61	255575	6069240	255578	6069213	2.80	-26.60	27	354	SKA	
20-Sep-2012	20:16	19	TCC_CAM_16			Freshwater lens camera	61	255560	6069225	255578	6069213	17.83	-12.01	22	304	SKA	
20-Sep-2012	20:17	20	TCC_CAM_16			Freshwater lens camera	61	255564	6069210	255578	6069213	13.22	3.80	14	254	SKA	
20-Sep-2012	20:19	21	TCC_CAM_16			Freshwater lens camera	61	255586	6069198	255578	6069213	-8.15	15.51	18	152	SKA	
20-Sep-2012	20:20	22	TCC_CAM_16			Freshwater lens camera	61	255585	6069199	255578	6069213	-7.17	14.58	16	154	SKA	
20-Sep-2012	20:21	23	TCC_CAM_16			Freshwater lens camera	61	255585	6069201	255578	6069213	-7.30	12.35	14	149	SKA	
20-Sep-2012	20:23	24	TCC_CAM_16			Freshwater lens camera	61	255589	6069210	255578	6069213	-11.15	3.76	12	109	SKA	
20-Sep-2012	20:53	25	TCC_CAM_17			Freshwater lens camera	8	256616	6069620	256621	6069635	4.77	14.93	16	198	SKA	Depth inaccurate due to bow thruster interference
20-Sep-2012	20:54	26	TCC_CAM_17			Freshwater lens camera	60	256612	6069624	256621	6069635	8.34	10.71	14	218	SKA	
20-Sep-2012	20:55	27	TCC_CAM_17			Freshwater lens camera	60	256623	6069622	256621	6069635	-1.87	12.33	12	171	SKA	
20-Sep-2012	20:56	28	TCC_CAM_17			Freshwater lens camera	60	256624	6069641	256621	6069635	-3.18	-6.21	7	27	SKA	
20-Sep-2012	20:58	29	TCC_CAM_17			Freshwater lens camera	60	256616	6069649	256621	6069635	4.57	-13.81	15	342	SKA	
20-Sep-2012	20:58	30	TCC_CAM_17			Freshwater lens camera	60	256617	6069648	256621	6069635	3.37	-13.13	14	346	SKA	
20-Sep-2012	21:00	31	TCC_CAM_17			Freshwater lens camera	60	256611	6069654	256621	6069635	9.45	-19.64	22	334	SKA	
20-Sep-2012	21:01	32	TCC_CAM_17			Freshwater lens camera	60	256611	6069652	256621	6069635	9.52	-17.53	20	331	SKA	
20-Sep-2012	21:03	33	TCC_CAM_17			Freshwater lens camera	60	256608	6069650	256621	6069635	13.21	-15.59	20	320	SKA	
20-Sep-2012	21:03	34	TCC_CAM_17			Freshwater lens camera	60	256610	6069651	256621	6069635	10.53	-16.32	19	327	SKA	
20-Sep-2012	21:05	35	TCC_CAM_17			Freshwater lens camera	60	256644	6069661	256621	6069635	-23.44	-26.42	35	42	SKA	
20-Sep-2012	21:07	36	TCC_CAM_17			Freshwater lens camera	60	256627	6069645	256621	6069635	-6.33	-9.88	12	33	SKA	
20-Sep-2012	21:08	37	TCC_CAM_17			Freshwater lens camera	60	256626	6069638	256621	6069635	-5.09	-2.92	6	60	SKA	
20-Sep-2012	21:10	38	TCC_CAM_17			Freshwater lens camera	60	256639	6069628	256621	6069635	-18.06	6.63	19	110	SKA	
22-Sep-2012	10:29	39	TCC_CAM_19			Freshwater lens camera	63	258917	6070710	258887	6070718	-29.92	8.32	31	106	AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181					Vessel	Vigilant								
Client	Forewind Ltd					Vessel Reference Point (VRP)	COG								
Project Name	Teesside Cable Corridor Benthic Survey					Deployment Location		x	-6.54	y	-12.64	z	0		
Primary Positioning System	Fugro Starpack XHP					Actual Coordinates derived from	Beacon								
Geodetic Reference System	Datum	WGS84		Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)				Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
22-Sep-2012	10:29	40	TCC_CAM_19			Freshwater lens camera	63	258915	6070711	258887	6070718	-27.74	6.46	28	103	AN	
22-Sep-2012	10:29	41	TCC_CAM_19			Freshwater lens camera	63	258915	6070711	258887	6070718	-27.81	6.67	29	103	AN	
22-Sep-2012	10:31	42	TCC_CAM_19			Freshwater lens camera	63	258908	6070716	258887	6070718	-20.35	1.69	20	95	AN	
22-Sep-2012	10:44	43	TCC_CAM_19			Freshwater lens camera	63	258887	6070711	258887	6070718	0.84	7.19	7	187	AN	
22-Sep-2012	10:45	44	TCC_CAM_19			Freshwater lens camera	62	258885	6070710	258887	6070718	2.42	8.33	9	196	AN	
22-Sep-2012	10:45	45	TCC_CAM_19			Freshwater lens camera	8	258885	6070709	258887	6070718	2.22	9.38	10	193	AN	Depth inaccurate due to bow thruster interference
22-Sep-2012	10:46	46	TCC_CAM_19			Freshwater lens camera	62	258898	6070720	258887	6070718	-10.69	-1.93	11	80	AN	
22-Sep-2012	10:47	47	TCC_CAM_19			Freshwater lens camera	63	258911	6070736	258887	6070718	-23.16	-18.57	30	51	AN	
22-Sep-2012	10:47	48	TCC_CAM_19			Freshwater lens camera	63	258911	6070735	258887	6070718	-23.69	-17.35	29	54	AN	
22-Sep-2012	10:48	49	TCC_CAM_19			Freshwater lens camera	63	258920	6070729	258887	6070718	-32.21	-11.32	34	71	AN	
22-Sep-2012	10:49	50	TCC_CAM_19			Freshwater lens camera	63	258919	6070725	258887	6070718	-31.79	-7.15	33	77	AN	
22-Sep-2012	10:50	51	TCC_CAM_19			Freshwater lens camera	62	258906	6070710	258887	6070718	-18.11	8.40	20	115	AN	
22-Sep-2012	10:50	52	TCC_CAM_19			Freshwater lens camera	62	258896	6070701	258887	6070718	-8.11	16.42	18	154	AN	
22-Sep-2012	10:51	53	TCC_CAM_19			Freshwater lens camera	62	258893	6070698	258887	6070718	-5.63	19.54	20	164	AN	
22-Sep-2012	10:52	54	TCC_CAM_19			Freshwater lens camera	62	258895	6070695	258887	6070718	-7.61	22.75	24	162	AN	
22-Sep-2012	10:52	55	TCC_CAM_19			Freshwater lens camera	62	258896	6070695	258887	6070718	-8.57	22.62	24	159	AN	
22-Sep-2012	10:53	56	TCC_CAM_19			Freshwater lens camera	62	258901	6070694	258887	6070718	-13.08	23.98	27	151	AN	
22-Sep-2012	10:54	57	TCC_CAM_19			Freshwater lens camera	62	258895	6070695	258887	6070718	-7.56	23.21	24	162	AN	
22-Sep-2012	10:55	58	TCC_CAM_19			Freshwater lens camera	62	258893	6070697	258887	6070718	-5.85	21.18	22	165	AN	
22-Sep-2012	10:56	59	TCC_CAM_19			Freshwater lens camera	62	258896	6070699	258887	6070718	-8.26	18.80	21	156	AN	
22-Sep-2012	10:58	60	TCC_CAM_19			Freshwater lens camera	62	258894	6070702	258887	6070718	-6.61	16.00	17	158	AN	
22-Sep-2012	10:58	61	TCC_CAM_19			Freshwater lens camera	62	258902	6070689	258887	6070718	-14.29	28.80	32	154	AN	
22-Sep-2012	11:00	62	TCC_CAM_19			Freshwater lens camera	62	258898	6070694	258887	6070718	-11.00	24.26	27	156	AN	
22-Sep-2012	11:00	63	TCC_CAM_19			Freshwater lens camera	62	258904	6070693	258887	6070718	-16.76	24.77	30	146	AN	
22-Sep-2012	11:01	64	TCC_CAM_19			Freshwater lens camera	62	258909	6070699	258887	6070718	-21.54	18.80	29	131	AN	
22-Sep-2012	11:41	65	TCC_CAM_18			Freshwater lens camera	62	258828	6071732	258827	6071741	-0.59	8.68	9	176	SKA	
22-Sep-2012	11:43	66	TCC_CAM_18			Freshwater lens camera	62	258832	6071742	258827	6071741	-4.99	-1.57	5	73	SKA	
22-Sep-2012	11:45	67	TCC_CAM_18			Freshwater lens camera	62	258824	6071745	258827	6071741	3.48	-4.33	6	321	SKA	
22-Sep-2012	11:47	68	TCC_CAM_18			Freshwater lens camera	62	258819	6071745	258827	6071741	8.06	-4.08	9	297	SKA	
22-Sep-2012	11:49	69	TCC_CAM_18			Freshwater lens camera	62	258819	6071737	258827	6071741	8.18	3.53	9	247	SKA	
22-Sep-2012	11:49	70	TCC_CAM_18			Freshwater lens camera	62	258819	6071737	258827	6071741	8.20	4.13	9	243	SKA	
22-Sep-2012	11:51	71	TCC_CAM_18			Freshwater lens camera	62	258820	6071729	258827	6071741	7.40	12.26	14	211	SKA	
22-Sep-2012	11:52	72	TCC_CAM_18			Freshwater lens camera	62	258819	6071725	258827	6071741	8.45	16.03	18	208	SKA	
22-Sep-2012	11:53	73	TCC_CAM_18			Freshwater lens camera	62	258817	6071719	258827	6071741	10.51	22.02	24	206	SKA	
22-Sep-2012	11:54	74	TCC_CAM_18			Freshwater lens camera	62	258817	6071711	258827	6071741	10.55	29.75	32	200	SKA	
22-Sep-2012	11:56	75	TCC_CAM_18			Freshwater lens camera	62	258814	6071718	258827	6071741	13.56	22.95	27	211	SKA	
22-Sep-2012	11:58	76	TCC_CAM_18			Freshwater lens camera	62	258812	6071726	258827	6071741	15.26	15.18	22	225	SKA	
22-Sep-2012	14:54	77	TCC_CAM_20			Freshwater lens camera	63	265536	6075004	265547	6074991	11.14	-13.27	17	320	SKA	
22-Sep-2012	14:56	78	TCC_CAM_20			Freshwater lens camera	63	265487	6074941	265547	6074991	60.38	49.88	78	230	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant									
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG									
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0			
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon									
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT				

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
22-Sep-2012	14:58	79	TCC_CAM_20			Freshwater lens camera	63	265537	6074997	265547	6074991	9.89	-6.64	12	304	SKA	
22-Sep-2012	15:01	80	TCC_CAM_20			Freshwater lens camera	63	265533	6074990	265547	6074991	13.63	0.27	14	269	SKA	
22-Sep-2012	15:04	81	TCC_CAM_20			Freshwater lens camera	63	265545	6075003	265547	6074991	2.36	-12.44	13	349	SKA	
22-Sep-2012	15:06	82	TCC_CAM_20			Freshwater lens camera	63	265542	6075013	265547	6074991	4.94	-22.72	23	348	SKA	
22-Sep-2012	15:08	83	TCC_CAM_20			Freshwater lens camera	63	265531	6075018	265547	6074991	15.72	-27.83	32	331	SKA	
22-Sep-2012	15:10	84	TCC_CAM_20			Freshwater lens camera	63	265523	6075004	265547	6074991	24.32	-13.11	28	298	SKA	
22-Sep-2012	15:11	85	TCC_CAM_20			Freshwater lens camera	63	265527	6074998	265547	6074991	20.12	-6.98	21	289	SKA	
22-Sep-2012	15:12	86	TCC_CAM_20			Freshwater lens camera	63	265533	6074994	265547	6074991	14.05	-3.50	14	284	SKA	
22-Sep-2012	15:12	87	TCC_CAM_20			Freshwater lens camera	63	265534	6074994	265547	6074991	13.16	-3.95	14	287	SKA	
22-Sep-2012	15:51	88	TCC_CAM_21			Freshwater lens camera	61	266076	6074116	266109	6074108	32.67	-8.36	34	284	SKA	
22-Sep-2012	15:53	89	TCC_CAM_21			Freshwater lens camera	61	266067	6074101	266109	6074108	41.91	6.86	42	261	SKA	
22-Sep-2012	15:57	90	TCC_CAM_21			Freshwater lens camera	61	266087	6074078	266109	6074108	22.18	29.57	37	217	SKA	
22-Sep-2012	15:57	91	TCC_CAM_21			Freshwater lens camera	61	266087	6074079	266109	6074108	21.58	29.29	36	216	SKA	
22-Sep-2012	16:00	92	TCC_CAM_21			Freshwater lens camera	61	266090	6074048	266109	6074108	18.34	59.78	63	197	SKA	
22-Sep-2012	16:04	93	TCC_CAM_21			Freshwater lens camera	61	266120	6074059	266109	6074108	-10.72	49.01	50	168	SKA	
22-Sep-2012	16:07	94	TCC_CAM_21			Freshwater lens camera	10	266134	6074053	266109	6074108	-25.54	54.73	60	155	SKA	Depth inaccurate due to bow thruster interference
22-Sep-2012	16:07	95	TCC_CAM_21			Freshwater lens camera	11	266136	6074052	266109	6074108	-27.21	55.49	62	154	SKA	Depth inaccurate due to bow thruster interference
22-Sep-2012	16:07	96	TCC_CAM_21			Freshwater lens camera	61	266139	6074053	266109	6074108	-30.24	54.57	62	151	SKA	
22-Sep-2012	16:07	97	TCC_CAM_21			Freshwater lens camera	61	266139	6074055	266109	6074108	-29.78	52.68	61	151	SKA	
22-Sep-2012	16:16	98	TCC_CAM_21			Freshwater lens camera	62	266066	6074134	266109	6074108	42.82	-25.86	50	301	SKA	
22-Sep-2012	16:18	99	TCC_CAM_21			Freshwater lens camera	62	266070	6074146	266109	6074108	39.03	-38.11	55	314	SKA	
22-Sep-2012	16:20	100	TCC_CAM_21			Freshwater lens camera	62	266078	6074138	266109	6074108	31.24	-30.13	43	314	SKA	
22-Sep-2012	16:21	101	TCC_CAM_21			Freshwater lens camera	62	266077	6074138	266109	6074108	31.86	-30.04	44	313	SKA	
22-Sep-2012	16:23	102	TCC_CAM_21			Freshwater lens camera	62	266069	6074121	266109	6074108	39.38	-13.37	42	289	SKA	
22-Sep-2012	19:24	103	TCC_CAM_22			Freshwater lens camera	67	271568	6077877	271585	6077859	17.28	-17.71	25	316	SKA	
22-Sep-2012	19:26	104	TCC_CAM_22			Freshwater lens camera	68	271566	6077873	271585	6077859	18.48	-13.91	23	307	SKA	
22-Sep-2012	19:28	105	TCC_CAM_22			Freshwater lens camera	68	271568	6077868	271585	6077859	17.19	-8.78	19	297	SKA	
22-Sep-2012	19:30	106	TCC_CAM_22			Freshwater lens camera	68	271575	6077850	271585	6077859	9.73	8.79	13	228	SKA	
22-Sep-2012	19:32	107	TCC_CAM_22			Freshwater lens camera	68	271582	6077837	271585	6077859	3.17	21.91	22	188	SKA	
22-Sep-2012	19:34	108	TCC_CAM_22			Freshwater lens camera	68	271593	6077825	271585	6077859	-8.39	34.22	35	66	SKA	
22-Sep-2012	19:37	109	TCC_CAM_22			Freshwater lens camera	68	271607	6077812	271585	6077859	-21.99	46.71	52	155	SKA	
22-Sep-2012	19:38	110	TCC_CAM_22			Freshwater lens camera	68	271624	6077823	271585	6077859	-39.11	35.79	53	132	SKA	
22-Sep-2012	19:40	111	TCC_CAM_22			Freshwater lens camera	68	271619	6077838	271585	6077859	-33.66	21.47	40	123	SKA	
22-Sep-2012	19:44	112	TCC_CAM_22			Freshwater lens camera	68	271566	6077889	271585	6077859	19.03	-29.91	35	328	SKA	
22-Sep-2012	19:47	113	TCC_CAM_22			Freshwater lens camera	68	271565	6077888	271585	6077859	20.23	-28.59	35	325	SKA	
22-Sep-2012	19:48	114	TCC_CAM_22			Freshwater lens camera	68	271565	6077887	271585	6077859	20.05	-28.18	35	325	SKA	
22-Sep-2012	19:48	115	TCC_CAM_22			Freshwater lens camera	68	271566	6077887	271585	6077859	19.33	-28.21	34	326	SKA	
22-Sep-2012	19:48	116	TCC_CAM_22			Freshwater lens camera	68	271568	6077887	271585	6077859	17.27	-27.84	33	328	SKA	
22-Sep-2012	19:51	117	TCC_CAM_22			Freshwater lens camera	68	271571	6077885	271585	6077859	14.18	-26.20	30	332	SKA	

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Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
22-Sep-2012	20:22	118	TCC_CAM_23			Freshwater lens camera	68	272333	6077103	272327	6077077	-5.89	-26.49	27	13	SKA	
22-Sep-2012	20:24	119	TCC_CAM_23			Freshwater lens camera	68	272332	6077105	272327	6077077	-4.82	-28.29	29	10	SKA	
22-Sep-2012	20:25	120	TCC_CAM_23			Freshwater lens camera	68	272330	6077104	272327	6077077	-2.71	-27.52	28	6	SKA	
22-Sep-2012	20:25	121	TCC_CAM_23			Freshwater lens camera	68	272329	6077104	272327	6077077	-1.93	-27.75	28	4	SKA	
22-Sep-2012	20:28	122	TCC_CAM_23			Freshwater lens camera	68	272306	6077092	272327	6077077	21.18	-15.79	26	307	SKA	
22-Sep-2012	20:29	123	TCC_CAM_23			Freshwater lens camera	67	272303	6077087	272327	6077077	24.55	-10.32	27	293	SKA	
22-Sep-2012	20:31	124	TCC_CAM_23			Freshwater lens camera	67	272294	6077078	272327	6077077	33.01	-0.89	33	272	SKA	
22-Sep-2012	20:32	125	TCC_CAM_23			Freshwater lens camera	67	272297	6077072	272327	6077077	30.54	4.69	31	261	SKA	
22-Sep-2012	20:34	126	TCC_CAM_23			Freshwater lens camera	67	272304	6077060	272327	6077077	23.64	16.43	29	235	SKA	
22-Sep-2012	20:35	127	TCC_CAM_23			Freshwater lens camera	67	272317	6077059	272327	6077077	10.09	17.41	20	210	SKA	
22-Sep-2012	20:38	128	TCC_CAM_23			Freshwater lens camera	67	272348	6077055	272327	6077077	-21.06	21.74	30	136	SKA	
22-Sep-2012	20:40	129	TCC_CAM_23			Freshwater lens camera	67	272377	6077073	272327	6077077	-49.69	3.93	50	95	SKA	
22-Sep-2012	21:26	130	TCC_CAM_24			Freshwater lens camera	69	278291	6078757	278285	6078722	-6.65	-35.56	36	11	SKA	
22-Sep-2012	21:26	131	TCC_CAM_24			Freshwater lens camera	69	278291	6078757	278285	6078722	-6.68	-35.65	36	11	SKA	
22-Sep-2012	21:27	132	TCC_CAM_24			Freshwater lens camera	69	278296	6078758	278285	6078722	-11.17	-36.81	38	17	SKA	
22-Sep-2012	21:29	133	TCC_CAM_24			Freshwater lens camera	69	278294	6078760	278285	6078722	-9.59	-38.14	39	14	SKA	
22-Sep-2012	21:31	134	TCC_CAM_24			Freshwater lens camera	69	278294	6078762	278285	6078722	-9.52	-40.49	42	13	SKA	
22-Sep-2012	21:32	135	TCC_CAM_24			Freshwater lens camera	69	278304	6078755	278285	6078722	-19.17	-33.82	39	30	SKA	
22-Sep-2012	21:36	136	TCC_CAM_24			Freshwater lens camera	69	278322	6078714	278285	6078722	-37.62	7.06	38	101	SKA	
22-Sep-2012	21:40	137	TCC_CAM_24			Freshwater lens camera	69	278294	6078716	278285	6078722	-9.39	5.15	11	119	SKA	
22-Sep-2012	21:42	138	TCC_CAM_24			Freshwater lens camera	69	278264	6078719	278285	6078722	20.64	2.91	21	262	SKA	
22-Sep-2012	21:43	139	TCC_CAM_24			Freshwater lens camera	69	278261	6078716	278285	6078722	23.61	5.94	24	256	SKA	
22-Sep-2012	21:44	140	TCC_CAM_24			Freshwater lens camera	69	278262	6078709	278285	6078722	23.22	12.73	26	241	SKA	
23-Sep-2012	00:36	141	TCC_CAM_25			Freshwater lens camera	69	286026	6078502	285987	6078481	-38.09	-20.73	43	241	AN	Beacon fix inaccurate due to bow thruster interference
23-Sep-2012	00:39	142	TCC_CAM_25			Freshwater lens camera	69	285995	6078496	285987	6078481	-7.64	-14.95	17	27	AN	
23-Sep-2012	00:40	143	TCC_CAM_25			Freshwater lens camera	69	285991	6078499	285987	6078481	-3.92	-18.58	19	12	AN	
23-Sep-2012	00:41	144	TCC_CAM_25			Freshwater lens camera	69	285980	6078504	285987	6078481	7.69	-23.44	25	342	AN	
23-Sep-2012	00:42	145	TCC_CAM_25			Freshwater lens camera	69	285963	6078499	285987	6078481	23.99	-18.40	30	308	AN	
23-Sep-2012	00:47	146	TCC_CAM_25			Freshwater lens camera	69	285972	6078523	285987	6078481	15.76	-42.29	45	340	AN	
23-Sep-2012	00:48	147	TCC_CAM_25			Freshwater lens camera	69	285971	6078523	285987	6078481	16.69	-42.49	46	339	AN	
23-Sep-2012	00:49	148	TCC_CAM_25			Freshwater lens camera	69	285974	6078529	285987	6078481	12.99	-48.51	50	345	AN	
23-Sep-2012	00:50	149	TCC_CAM_25			Freshwater lens camera	69	285984	6078525	285987	6078481	3.01	-44.48	45	356	AN	
23-Sep-2012	00:51	150	TCC_CAM_25			Freshwater lens camera	69	285990	6078520	285987	6078481	-2.73	-39.66	40	4	AN	
23-Sep-2012	00:52	151	TCC_CAM_25			Freshwater lens camera	69	285997	6078516	285987	6078481	-9.07	-35.62	37	14	AN	
23-Sep-2012	00:52	152	TCC_CAM_25			Freshwater lens camera	69	285997	6078517	285987	6078481	-9.79	-35.91	37	15	AN	
23-Sep-2012	00:54	153	TCC_CAM_25			Freshwater lens camera	69	285999	6078529	285987	6078481	-11.76	-48.00	49	14	AN	
23-Sep-2012	00:55	154	TCC_CAM_25			Freshwater lens camera	69	286004	6078517	285987	6078481	-16.47	-36.65	40	24	AN	
23-Sep-2012	01:34	155	TCC_CAM_26			Freshwater lens camera	69	286264	6077578	286248	6077558	-15.81	-19.47	25	39	AN	
23-Sep-2012	01:35	156	TCC_CAM_26			Freshwater lens camera	69	286266	6077574	286248	6077558	-17.91	-16.16	24	48	AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
23-Sep-2012	01:35	157	TCC_CAM_26			Freshwater lens camera	69	286267	6077575	286248	6077558	-18.71	-16.57	25	48	AN	
23-Sep-2012	01:36	158	TCC_CAM_26			Freshwater lens camera	69	286270	6077574	286248	6077558	-21.35	-15.63	26	54	AN	
23-Sep-2012	01:37	159	TCC_CAM_26			Freshwater lens camera	69	286271	6077573	286248	6077558	-23.14	-14.53	27	58	AN	
23-Sep-2012	01:38	160	TCC_CAM_26			Freshwater lens camera	69	286272	6077573	286248	6077558	-23.76	-14.81	28	58	AN	
23-Sep-2012	01:38	161	TCC_CAM_26			Freshwater lens camera	69	286273	6077573	286248	6077558	-24.37	-14.59	28	59	AN	
23-Sep-2012	01:39	162	TCC_CAM_26			Freshwater lens camera	69	286276	6077573	286248	6077558	-28.01	-14.62	32	62	AN	
23-Sep-2012	01:40	163	TCC_CAM_26			Freshwater lens camera	69	286281	6077575	286248	6077558	-32.63	-16.71	37	63	AN	
23-Sep-2012	01:41	164	TCC_CAM_26			Freshwater lens camera	69	286278	6077572	286248	6077558	-29.91	-14.34	33	64	AN	
23-Sep-2012	01:43	165	TCC_CAM_26			Freshwater lens camera	69	286274	6077571	286248	6077558	-25.65	-12.56	29	64	AN	
23-Sep-2012	01:44	166	TCC_CAM_26			Freshwater lens camera	68	286273	6077576	286248	6077558	-24.93	-18.04	31	54	AN	
23-Sep-2012	01:45	167	TCC_CAM_26			Freshwater lens camera	68	286272	6077582	286248	6077558	-23.77	-23.51	33	45	AN	
23-Sep-2012	01:46	168	TCC_CAM_26			Freshwater lens camera	69	286269	6077591	286248	6077558	-20.50	-32.40	38	32	AN	
23-Sep-2012	01:47	169	TCC_CAM_26			Freshwater lens camera	68	286263	6077592	286248	6077558	-14.41	-33.70	37	23	AN	
23-Sep-2012	01:48	170	TCC_CAM_26			Freshwater lens camera	69	286258	6077591	286248	6077558	-9.77	-32.73	34	17	AN	
23-Sep-2012	01:49	171	TCC_CAM_26			Freshwater lens camera	68	286247	6077588	286248	6077558	0.77	-29.78	30	359	AN	
23-Sep-2012	01:50	172	TCC_CAM_26			Freshwater lens camera	68	286243	6077588	286248	6077558	5.11	-29.44	30	350	AN	
23-Sep-2012	01:51	173	TCC_CAM_26			Freshwater lens camera	68	286238	6077585	286248	6077558	10.15	-27.05	29	339	AN	
23-Sep-2012	02:47	174	TCC_CAM_27			Freshwater lens camera	70	290635	6078721	290641	6078722	6.65	0.14	7	269	AN	
23-Sep-2012	02:48	175	TCC_CAM_27			Freshwater lens camera	70	290633	6078718	290641	6078722	7.97	3.53	9	246	AN	
23-Sep-2012	02:49	176	TCC_CAM_27			Freshwater lens camera	70	290633	6078716	290641	6078722	8.05	5.87	10	234	AN	
23-Sep-2012	02:51	177	TCC_CAM_27			Freshwater lens camera	70	290635	6078714	290641	6078722	6.16	7.08	9	221	AN	
23-Sep-2012	02:52	178	TCC_CAM_27			Freshwater lens camera	70	290637	6078716	290641	6078722	4.57	5.31	7	221	AN	
23-Sep-2012	02:53	179	TCC_CAM_27			Freshwater lens camera	70	290636	6078717	290641	6078722	4.92	4.55	7	227	AN	
23-Sep-2012	02:55	180	TCC_CAM_27			Freshwater lens camera	70	290633	6078719	290641	6078722	7.82	2.56	8	252	AN	
23-Sep-2012	02:56	181	TCC_CAM_27			Freshwater lens camera	70	290630	6078722	290641	6078722	11.40	-0.46	11	272	AN	
23-Sep-2012	02:57	182	TCC_CAM_27			Freshwater lens camera	70	290630	6078722	290641	6078722	10.94	-0.94	11	275	AN	
23-Sep-2012	02:58	183	TCC_CAM_27			Freshwater lens camera	70	290630	6078728	290641	6078722	10.72	-6.19	12	300	AN	
23-Sep-2012	03:00	184	TCC_CAM_27			Freshwater lens camera	70	290632	6078734	290641	6078722	9.53	-12.04	15	321	AN	
23-Sep-2012	03:01	185	TCC_CAM_27			Freshwater lens camera	70	290634	6078741	290641	6078722	7.23	-19.56	21	340	AN	
23-Sep-2012	03:03	186	TCC_CAM_27			Freshwater lens camera	70	290636	6078744	290641	6078722	5.21	-22.20	23	347	AN	
23-Sep-2012	03:03	187	TCC_CAM_27			Freshwater lens camera	8	290640	6078748	290641	6078722	1.24	-26.32	26	357	AN	Depth inaccurate due to bow thruster interference
23-Sep-2012	04:01	188	TCC_CAM_28			Freshwater lens camera	78	293681	6080694	293690	6080667	8.75	-27.14	29	342	AN	
23-Sep-2012	04:02	189	TCC_CAM_28			Freshwater lens camera	78	293712	6080684	293690	6080667	-22.19	-16.52	28	53	AN	
23-Sep-2012	04:05	190	TCC_CAM_28			Freshwater lens camera	78	293684	6080681	293690	6080667	6.54	-13.72	15	335	AN	
23-Sep-2012	04:05	191	TCC_CAM_28			Freshwater lens camera	78	293685	6080680	293690	6080667	5.53	-13.19	14	337	AN	
23-Sep-2012	04:06	192	TCC_CAM_28			Freshwater lens camera	78	293686	6080683	293690	6080667	4.62	-16.08	17	344	AN	
23-Sep-2012	04:08	193	TCC_CAM_28			Freshwater lens camera	78	293690	6080688	293690	6080667	0.33	-20.85	21	359	AN	
23-Sep-2012	04:09	194	TCC_CAM_28			Freshwater lens camera	78	293686	6080687	293690	6080667	4.52	-19.97	20	347	AN	
23-Sep-2012	04:10	195	TCC_CAM_28			Freshwater lens camera	78	293675	6080681	293690	6080667	15.62	-13.85	21	332	AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant						
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG						
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT	

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
23-Sep-2012	04:12	196	TCC_CAM_28			Freshwater lens camera	78	293665	6080688	293690	6080667	25.62	-20.39	33	309	AN	
23-Sep-2012	04:13	197	TCC_CAM_28			Freshwater lens camera	78	293658	6080686	293690	6080667	32.68	-18.66	38	300	AN	
23-Sep-2012	04:14	198	TCC_CAM_28			Freshwater lens camera	78	293649	6080671	293690	6080667	41.23	-4.15	41	276	AN	
23-Sep-2012	04:15	199	TCC_CAM_28			Freshwater lens camera	78	293645	6080672	293690	6080667	45.65	-4.22	46	275	AN	
23-Sep-2012	05:00	200	TCC_CAM_29			Freshwater lens camera	77	295417	6081142	295435	6081109	18.37	-32.97	38	330	AN	
23-Sep-2012	05:02	201	TCC_CAM_29			Freshwater lens camera	77	295419	6081137	295435	6081109	16.50	-28.65	33	330	AN	
23-Sep-2012	05:03	202	TCC_CAM_29			Freshwater lens camera	77	295423	6081136	295435	6081109	12.24	-27.38	30	336	AN	
23-Sep-2012	05:04	203	TCC_CAM_29			Freshwater lens camera	77	295424	6081133	295435	6081109	11.64	-24.23	27	334	AN	
23-Sep-2012	05:06	204	TCC_CAM_29			Freshwater lens camera	77	295426	6081124	295435	6081109	9.05	-15.36	18	329	AN	
23-Sep-2012	05:08	205	TCC_CAM_29			Freshwater lens camera	77	295429	6081122	295435	6081109	6.11	-13.83	15	336	AN	
23-Sep-2012	05:10	206	TCC_CAM_29			Freshwater lens camera	77	295436	6081120	295435	6081109	-1.04	-10.96	11	5	AN	
23-Sep-2012	05:11	207	TCC_CAM_29			Freshwater lens camera	77	295445	6081116	295435	6081109	-9.60	-7.18	12	53	AN	
23-Sep-2012	05:12	208	TCC_CAM_29			Freshwater lens camera	77	295446	6081114	295435	6081109	-10.75	-5.55	12	63	AN	
23-Sep-2012	05:12	209	TCC_CAM_29			Freshwater lens camera	77	295446	6081115	295435	6081109	-10.59	-6.10	12	60	AN	
23-Sep-2012	06:03	210	TCC_CAM_30			Freshwater lens camera	78	297346	6080701	297361	6080707	14.58	6.15	16	247	AN	
23-Sep-2012	06:04	211	TCC_CAM_30			Freshwater lens camera	78	297342	6080699	297361	6080707	18.71	8.43	21	246	AN	
23-Sep-2012	06:05	212	TCC_CAM_30			Freshwater lens camera	78	297343	6080694	297361	6080707	17.52	13.15	22	233	AN	
23-Sep-2012	06:06	213	TCC_CAM_30			Freshwater lens camera	78	297345	6080688	297361	6080707	15.82	19.10	25	220	AN	
23-Sep-2012	06:07	214	TCC_CAM_30			Freshwater lens camera	78	297346	6080677	297361	6080707	15.49	30.06	34	207	AN	
23-Sep-2012	06:09	215	TCC_CAM_30			Freshwater lens camera	78	297342	6080675	297361	6080707	19.22	32.88	38	210	AN	
23-Sep-2012	06:10	216	TCC_CAM_30			Freshwater lens camera	78	297334	6080685	297361	6080707	27.23	22.62	35	230	AN	
23-Sep-2012	06:11	217	TCC_CAM_30			Freshwater lens camera	78	297330	6080686	297361	6080707	30.80	21.74	38	235	AN	
23-Sep-2012	06:13	218	TCC_CAM_30			Freshwater lens camera	79	297335	6080693	297361	6080707	26.47	14.29	30	242	AN	
23-Sep-2012	06:20	219	TCC_CAM_30			Freshwater lens camera	78	297343	6080717	297361	6080707	18.10	-9.62	21	298	AN	
23-Sep-2012	06:21	220	TCC_CAM_30			Freshwater lens camera	78	297344	6080712	297361	6080707	17.18	-4.20	18	284	AN	
23-Sep-2012	06:22	221	TCC_CAM_30			Freshwater lens camera	78	297343	6080706	297361	6080707	18.37	1.33	18	266	AN	
23-Sep-2012	06:23	222	TCC_CAM_30			Freshwater lens camera	78	297344	6080700	297361	6080707	16.94	7.02	18	248	AN	
23-Sep-2012	06:24	223	TCC_CAM_30			Freshwater lens camera	78	297353	6080694	297361	6080707	7.91	13.66	16	210	AN	
23-Sep-2012	07:16	224	TCC_CAM_31			Freshwater lens camera	88	300708	6082308	300671	6082352	-37.55	43.99	58	140	AN	
23-Sep-2012	07:17	225	TCC_CAM_31			Freshwater lens camera	88	300714	6082307	300671	6082352	-42.75	45.74	63	137	AN	
23-Sep-2012	07:17	226	TCC_CAM_31			Freshwater lens camera	9	300707	6082307	300671	6082352	-36.11	44.99	58	141	AN	Depth inaccurate due to bow thruster interference
23-Sep-2012	07:22	227	TCC_CAM_31			Freshwater lens camera	88	300599	6082351	300671	6082352	71.90	1.55	72	269	AN	
23-Sep-2012	07:25	228	TCC_CAM_31			Freshwater lens camera	89	300660	6082314	300671	6082352	10.57	38.39	40	195	AN	
23-Sep-2012	07:26	229	TCC_CAM_31			Freshwater lens camera	89	300667	6082312	300671	6082352	4.14	40.04	40	186	AN	
23-Sep-2012	07:27	230	TCC_CAM_31			Freshwater lens camera	89	300669	6082311	300671	6082352	2.11	40.79	41	183	AN	
23-Sep-2012	07:28	231	TCC_CAM_31			Freshwater lens camera	89	300667	6082311	300671	6082352	3.68	41.01	41	185	AN	
23-Sep-2012	07:28	232	TCC_CAM_31			Freshwater lens camera	89	300668	6082310	300671	6082352	2.38	42.11	42	183	AN	
23-Sep-2012	07:29	233	TCC_CAM_31			Freshwater lens camera	89	300670	6082310	300671	6082352	1.01	42.48	43	181	AN	
23-Sep-2012	07:30	234	TCC_CAM_31			Freshwater lens camera	89	300675	6082311	300671	6082352	-3.81	41.31	41	175	AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
23-Sep-2012	07:31	235	TCC_CAM_31			Freshwater lens camera	89	300686	6082315	300671	6082352	-14.70	37.27	40	158	AN	
23-Sep-2012	07:32	236	TCC_CAM_31			Freshwater lens camera	89	300688	6082317	300671	6082352	-17.30	35.20	39	154	AN	
23-Sep-2012	07:33	237	TCC_CAM_31			Freshwater lens camera	89	300689	6082320	300671	6082352	-18.64	32.38	37	150	AN	
23-Sep-2012	07:33	238	TCC_CAM_31			Freshwater lens camera	89	300689	6082320	300671	6082352	-18.38	32.60	37	151	AN	
23-Sep-2012	07:34	239	TCC_CAM_31			Freshwater lens camera	89	300694	6082327	300671	6082352	-22.91	25.07	34	138	AN	
23-Sep-2012	11:30	240	TCC_CAM_32			Freshwater lens camera	82	305322	6085229	305325	6085221	2.20	-8.76	9	346	SKA	
23-Sep-2012	11:32	241	TCC_CAM_32			Freshwater lens camera	82	305330	6085221	305325	6085221	-4.98	0.12	5	91	SKA	
23-Sep-2012	11:33	242	TCC_CAM_32			Freshwater lens camera	82	305325	6085214	305325	6085221	-0.93	6.64	7	172	SKA	
23-Sep-2012	11:35	243	TCC_CAM_32			Freshwater lens camera	82	305320	6085212	305325	6085221	4.32	8.92	10	206	SKA	
23-Sep-2012	11:36	244	TCC_CAM_32			Freshwater lens camera	82	305315	6085205	305325	6085221	9.98	16.10	19	212	SKA	
23-Sep-2012	11:38	245	TCC_CAM_32			Freshwater lens camera	82	305310	6085193	305325	6085221	14.15	27.75	31	207	SKA	
23-Sep-2012	11:40	246	TCC_CAM_32			Freshwater lens camera	82	305299	6085194	305325	6085221	25.91	26.86	37	224	SKA	
23-Sep-2012	11:42	247	TCC_CAM_32			Freshwater lens camera	82	305292	6085200	305325	6085221	32.28	21.00	39	237	SKA	
23-Sep-2012	11:43	248	TCC_CAM_32			Freshwater lens camera	82	305293	6085207	305325	6085221	31.95	13.71	35	247	SKA	
23-Sep-2012	11:45	249	TCC_CAM_32			Freshwater lens camera	82	305295	6085211	305325	6085221	29.29	9.90	31	251	SKA	
23-Sep-2012	11:46	250	TCC_CAM_32			Freshwater lens camera	82	305296	6085215	305325	6085221	28.82	5.72	29	259	SKA	
23-Sep-2012	11:48	251	TCC_CAM_32			Freshwater lens camera	82	305294	6085217	305325	6085221	30.07	3.85	30	263	SKA	
23-Sep-2012	11:49	252	TCC_CAM_32			Freshwater lens camera	82	305291	6085212	305325	6085221	33.75	8.40	35	256	SKA	
23-Sep-2012	12:28	253	TCC_CAM_33			Freshwater lens camera	69	307187	6086324	307210	6086324	23.14	0.43	23	269	SKA	
23-Sep-2012	12:30	254	TCC_CAM_33			Freshwater lens camera	69	307190	6086329	307210	6086324	20.09	-4.59	21	283	SKA	
23-Sep-2012	12:31	255	TCC_CAM_33			Freshwater lens camera	69	307192	6086333	307210	6086324	18.24	-9.19	20	297	SKA	
23-Sep-2012	12:33	256	TCC_CAM_33			Freshwater lens camera	69	307193	6086330	307210	6086324	17.40	-5.68	18	288	SKA	
23-Sep-2012	12:35	257	TCC_CAM_33			Freshwater lens camera	69	307193	6086322	307210	6086324	17.21	2.26	17	263	SKA	
23-Sep-2012	12:37	258	TCC_CAM_33			Freshwater lens camera	69	307193	6086319	307210	6086324	16.77	5.18	18	253	SKA	
23-Sep-2012	12:37	259	TCC_CAM_33			Freshwater lens camera	69	307194	6086319	307210	6086324	16.58	5.27	17	252	SKA	
23-Sep-2012	12:39	260	TCC_CAM_33			Freshwater lens camera	69	307201	6086315	307210	6086324	9.20	9.48	13	224	SKA	
23-Sep-2012	12:40	261	TCC_CAM_33			Freshwater lens camera	69	307208	6086313	307210	6086324	1.89	11.34	12	189	SKA	
23-Sep-2012	12:43	262	TCC_CAM_33			Freshwater lens camera	69	307233	6086304	307210	6086324	-22.56	20.45	30	132	SKA	
23-Sep-2012	12:45	263	TCC_CAM_33			Freshwater lens camera	69	307271	6086303	307210	6086324	-61.06	20.51	64	109	SKA	
23-Sep-2012	12:47	264	TCC_CAM_33			Freshwater lens camera	69	307283	6086305	307210	6086324	-72.81	18.70	75	104	SKA	
23-Sep-2012	12:49	265	TCC_CAM_33			Freshwater lens camera	9	307298	6086302	307210	6086324	-87.49	21.51	90	104	SKA	Depth inaccurate due to bow thruster interference
23-Sep-2012	12:51	266	TCC_CAM_33			Freshwater lens camera	70	307323	6086300	307210	6086324	-112.96	23.95	115	102	SKA	
23-Sep-2012	12:54	267	TCC_CAM_33			Freshwater lens camera	70	307366	6086287	307210	6086324	-155.93	37.25	160	103	SKA	
23-Sep-2012	12:56	268	TCC_CAM_33			Freshwater lens camera	70	307366	6086291	307210	6086324	-156.17	32.65	160	102	SKA	
23-Sep-2012	12:57	269	TCC_CAM_33			Freshwater lens camera	70	307370	6086299	307210	6086324	-160.26	24.85	162	99	SKA	
23-Sep-2012	13:42	270	TCC_CAM_34			Freshwater lens camera	77	309472	6087632	309497	6087648	24.79	16.12	30	237	SKA	
26-Sep-2012	14:17	271	TCC_CAM_34			Freshwater lens camera	79	309526	6087604	309497	6087648	-29.04	43.79	53	146	SKA	
26-Sep-2012	14:19	272	TCC_CAM_34			Freshwater lens camera	79	309533	6087615	309497	6087648	-35.85	33.21	49	133	SKA	
26-Sep-2012	14:21	273	TCC_CAM_34			Freshwater lens camera	79	309537	6087619	309497	6087648	-40.23	29.38	50	126	SKA	

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Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
26-Sep-2012	14:22	274	TCC_CAM_34			Freshwater lens camera	79	309539	6087626	309497	6087648	-41.82	22.12	47	118	SKA	
26-Sep-2012	14:22	275	TCC_CAM_34			Freshwater lens camera	79	309539	6087626	309497	6087648	-42.61	21.80	48	117	SKA	
26-Sep-2012	14:23	276	TCC_CAM_34			Freshwater lens camera	79	309541	6087628	309497	6087648	-44.20	20.18	49	115	SKA	
26-Sep-2012	14:25	277	TCC_CAM_34			Freshwater lens camera	79	309539	6087640	309497	6087648	-42.32	7.86	43	101	SKA	
26-Sep-2012	14:28	278	TCC_CAM_34			Freshwater lens camera	79	309548	6087648	309497	6087648	-51.33	0.18	51	90	SKA	
26-Sep-2012	14:31	279	TCC_CAM_34			Freshwater lens camera	10	309549	6087653	309497	6087648	-51.70	-5.43	52	84	SKA	Depth inaccurate due to bow thruster interference
26-Sep-2012	14:33	280	TCC_CAM_34			Freshwater lens camera	79	309534	6087650	309497	6087648	-36.90	-1.79	37	87	SKA	
26-Sep-2012	14:35	281	TCC_CAM_34			Freshwater lens camera	79	309522	6087643	309497	6087648	-24.87	4.81	25	101	SKA	
26-Sep-2012	15:26	282	TCC_CAM_35			Freshwater lens camera	81	310929	6088523	310901	6088551	-28.47	27.68	40	134	SKA	
26-Sep-2012	15:27	283	TCC_CAM_35			Freshwater lens camera	82	310929	6088521	310901	6088551	-28.32	29.13	41	136	SKA	
26-Sep-2012	15:30	284	TCC_CAM_35			Freshwater lens camera	81	310947	6088516	310901	6088551	-46.08	35.00	58	127	SKA	
26-Sep-2012	15:34	285	TCC_CAM_35			Freshwater lens camera	81	310957	6088552	310901	6088551	-55.71	-1.41	56	89	SKA	
26-Sep-2012	15:35	286	TCC_CAM_35			Freshwater lens camera	81	310963	6088559	310901	6088551	-61.74	-8.85	62	82	SKA	
26-Sep-2012	15:37	287	TCC_CAM_35			Freshwater lens camera	8	310961	6088550	310901	6088551	-59.49	0.35	59	90	SKA	Depth inaccurate due to bow thruster interference
26-Sep-2012	15:39	288	TCC_CAM_35			Freshwater lens camera	81	310995	6088592	310901	6088551	-94.42	-41.62	103	66	SKA	
26-Sep-2012	15:42	289	TCC_CAM_35			Freshwater lens camera	81	310890	6088551	310901	6088551	10.54	-0.82	11	274	SKA	Camera drop point position used, due to poor beacon data
26-Sep-2012	15:43	290	TCC_CAM_35			Freshwater lens camera	81	310874	6088548	310901	6088551	26.61	2.06	27	266	SKA	Camera drop point position used, due to poor beacon data
26-Sep-2012	16:40	291	TCC_CAM_36			Freshwater lens camera	74	312893	6089869	312927	6089895	34.03	25.25	42	233	SKA	
26-Sep-2012	16:40	292	TCC_CAM_36			Freshwater lens camera	74	312894	6089867	312927	6089895	33.47	27.08	43	231	SKA	
26-Sep-2012	16:41	293	TCC_CAM_36			Freshwater lens camera	74	312896	6089877	312927	6089895	30.74	17.60	35	240	SKA	
26-Sep-2012	16:44	294	TCC_CAM_36			Freshwater lens camera	74	312908	6089876	312927	6089895	18.60	18.60	26	225	SKA	
26-Sep-2012	16:47	295	TCC_CAM_36			Freshwater lens camera	73	312920	6089909	312927	6089895	7.13	-14.15	16	333	SKA	
26-Sep-2012	16:48	296	TCC_CAM_36			Freshwater lens camera	73	312920	6089915	312927	6089895	6.73	-20.90	22	342	SKA	
26-Sep-2012	16:50	297	TCC_CAM_36			Freshwater lens camera	73	312916	6089913	312927	6089895	11.12	-18.50	22	329	SKA	
26-Sep-2012	16:52	298	TCC_CAM_36			Freshwater lens camera	73	312911	6089901	312927	6089895	15.57	-6.13	17	291	SKA	
26-Sep-2012	16:54	299	TCC_CAM_36			Freshwater lens camera	74	312908	6089894	312927	6089895	18.86	0.46	19	269	SKA	
26-Sep-2012	16:57	300	TCC_CAM_36			Freshwater lens camera	74	312906	6089878	312927	6089895	21.08	16.41	27	232	SKA	
26-Sep-2012	17:02	301	TCC_CAM_36			Freshwater lens camera	73	312900	6089878	312927	6089895	27.35	16.63	32	239	SKA	
26-Sep-2012	17:40	302	TCC_CAM_37			Freshwater lens camera	74	314047	6090553	314110	6090577	63.32	23.66	68	250	SKA	
26-Sep-2012	17:40	303	TCC_CAM_37			Freshwater lens camera	74	314048	6090553	314110	6090577	62.44	23.45	67	249	SKA	
26-Sep-2012	17:42	304	TCC_CAM_37			Freshwater lens camera	74	314069	6090523	314110	6090577	41.88	53.49	68	218	SKA	
26-Sep-2012	17:45	305	TCC_CAM_37			Freshwater lens camera	74	314112	6090566	314110	6090577	-1.11	10.13	10	174	SKA	
26-Sep-2012	17:47	306	TCC_CAM_37			Freshwater lens camera	74	314095	6090574	314110	6090577	15.71	2.57	16	261	SKA	
26-Sep-2012	17:49	307	TCC_CAM_37			Freshwater lens camera	75	314033	6090570	314110	6090577	76.96	6.36	77	265	SKA	
26-Sep-2012	17:52	308	TCC_CAM_37			Freshwater lens camera	60	314080	6090543	314110	6090577	29.98	33.50	45	222	SKA	
26-Sep-2012	17:52	309	TCC_CAM_37			Freshwater lens camera	8	314085	6090546	314110	6090577	25.67	30.70	40	220	SKA	Depth inaccurate due to bow thruster interference
26-Sep-2012	17:55	310	TCC_CAM_37			Freshwater lens camera	74	314125	6090569	314110	6090577	-14.20	7.93	16	119	SKA	
26-Sep-2012	17:57	311	TCC_CAM_37			Freshwater lens camera	74	314108	6090554	314110	6090577	2.24	22.17	22	186	SKA	
26-Sep-2012	17:59	312	TCC_CAM_37			Freshwater lens camera	74	314097	6090578	314110	6090577	13.67	-1.16	14	275	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
26-Sep-2012	18:56	313	TCC_CAM_38			Freshwater lens camera	9	316524	6092497	316638	6092582	114.39	85.68	143	233	SKA	Depth inaccurate due to bow thruster interference
26-Sep-2012	18:57	314	TCC_CAM_38			Freshwater lens camera	76	316575	6092554	316638	6092582	63.24	28.17	69	246	SKA	
26-Sep-2012	18:59	315	TCC_CAM_38			Freshwater lens camera	76	316584	6092565	316638	6092582	54.01	17.24	57	252	SKA	
26-Sep-2012	19:03	316	TCC_CAM_38			Freshwater lens camera	76	316652	6092559	316638	6092582	-14.49	23.57	28	148	SKA	
26-Sep-2012	19:05	317	TCC_CAM_38			Freshwater lens camera	76	316652	6092562	316638	6092582	-13.85	20.90	25	146	SKA	
26-Sep-2012	19:06	318	TCC_CAM_38			Freshwater lens camera	76	316643	6092567	316638	6092582	-4.78	15.37	16	163	SKA	
26-Sep-2012	19:07	319	TCC_CAM_38			Freshwater lens camera	76	316640	6092559	316638	6092582	-1.79	23.13	23	176	SKA	
26-Sep-2012	19:07	320	TCC_CAM_38			Freshwater lens camera	76	316638	6092557	316638	6092582	-0.04	25.77	26	180	SKA	
27-Sep_2012	14:40	321	TCC_CAM_38			Shallow water camera	78	316595	6092586	316638	6092582	42.72	-3.38	43	275	SKA	
27-Sep_2012	14:44	322	TCC_CAM_38			Shallow water camera	78	316612	6092574	316638	6092582	25.52	8.72	27	251	SKA	
27-Sep_2012	14:45	323	TCC_CAM_38			Shallow water camera	78	316608	6092577	316638	6092582	30.42	5.70	31	259	SKA	
27-Sep_2012	14:46	324	TCC_CAM_38			Shallow water camera	78	316603	6092579	316638	6092582	35.25	3.36	35	265	SKA	
27-Sep_2012	14:47	325	TCC_CAM_38			Shallow water camera	78	316601	6092580	316638	6092582	36.63	2.75	37	266	SKA	Beacon fix inaccurate due to bow thruster interference
27-Sep_2012	14:50	326	TCC_CAM_38			Shallow water camera	78	316628	6092622	316638	6092582	10.30	-39.51	41	345	SKA	
27-Sep_2012	14:54	327	TCC_CAM_38			Shallow water camera	78	316607	6092567	316638	6092582	31.30	15.79	35	243	SKA	Beacon fix inaccurate due to bow thruster interference
27-Sep_2012	15:57	328	TCC_CAM_39			Freshwater lens camera	80	317882	6092946	317882	6092923	-0.62	-22.25	22	2	SKA	
27-Sep_2012	16:01	329	TCC_CAM_39			Freshwater lens camera	80	317923	6092895	317882	6092923	-41.38	28.36	50	124	SKA	Beacon fix inaccurate due to bow thruster interference
27-Sep_2012	16:03	330	TCC_CAM_39			Freshwater lens camera	80	317895	6092932	317882	6092923	-13.67	-8.16	16	59	SKA	
27-Sep_2012	16:06	331	TCC_CAM_39			Freshwater lens camera	80	317901	6092913	317882	6092923	-19.29	10.86	22	119	SKA	
27-Sep_2012	16:08	332	TCC_CAM_39			Freshwater lens camera	80	317900	6092917	317882	6092923	-18.11	6.91	19	111	SKA	
27-Sep_2012	16:10	333	TCC_CAM_39			Freshwater lens camera	80	317897	6092921	317882	6092923	-14.95	2.09	15	98	SKA	
27-Sep_2012	16:13	334	TCC_CAM_39			Freshwater lens camera	80	317891	6092924	317882	6092923	-9.21	-0.19	9	89	SKA	
27-Sep_2012	16:16	335	TCC_CAM_39			Freshwater lens camera	80	317879	6092931	317882	6092923	2.29	-7.31	8	343	SKA	
27-Sep_2012	16:17	336	TCC_CAM_39			Freshwater lens camera	80	317877	6092938	317882	6092923	4.63	-14.04	15	342	SKA	
27-Sep_2012	16:18	337	TCC_CAM_39			Freshwater lens camera	80	317876	6092937	317882	6092923	5.78	-13.87	15	337	SKA	
27-Sep_2012	22:14	338	TCC_CAM_41			Freshwater lens camera	81	325423	6094260	325404	6094267	-19.01	7.55	20	112	SKA	
27-Sep_2012	22:15	339	TCC_CAM_41			Freshwater lens camera	81	325424	6094260	325404	6094267	-19.82	7.06	21	110	SKA	
27-Sep_2012	22:17	340	TCC_CAM_41			Freshwater lens camera	81	325430	6094263	325404	6094267	-25.99	4.01	26	99	SKA	
27-Sep_2012	22:18	341	TCC_CAM_41			Freshwater lens camera	80	325431	6094270	325404	6094267	-26.86	-2.17	27	85	SKA	
27-Sep_2012	22:20	342	TCC_CAM_41			Freshwater lens camera	80	325421	6094275	325404	6094267	-17.12	-8.02	19	65	SKA	
27-Sep_2012	22:23	343	TCC_CAM_41			Freshwater lens camera	80	325400	6094265	325404	6094267	4.05	2.37	5	240	SKA	
27-Sep_2012	22:24	344	TCC_CAM_41			Freshwater lens camera	80	325401	6094256	325404	6094267	2.98	11.50	12	195	SKA	
27-Sep_2012	22:25	345	TCC_CAM_41			Freshwater lens camera	81	325413	6094252	325404	6094267	-9.40	15.61	18	149	SKA	
27-Sep_2012	22:27	346	TCC_CAM_41			Freshwater lens camera	81	325422	6094252	325404	6094267	-17.73	15.61	24	131	SKA	
27-Sep_2012	22:28	347	TCC_CAM_41			Freshwater lens camera	81	325422	6094259	325404	6094267	-18.20	8.08	20	114	SKA	
27-Sep_2012	22:30	348	TCC_CAM_41			Freshwater lens camera	81	325425	6094270	325404	6094267	-21.18	-2.68	21	83	SKA	
27-Sep_2012	23:10	349	TCC_CAM_40			Freshwater lens camera	81	324742	6094108	324742	6094127	-0.26	19.05	19	179	AN	
27-Sep_2012	23:11	350	TCC_CAM_40			Freshwater lens camera	81	324741	6094108	324742	6094127	0.79	18.95	19	182	AN	
27-Sep_2012	23:12	351	TCC_CAM_40			Freshwater lens camera	81	324732	6094105	324742	6094127	9.71	21.82	24	204	AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant						
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG						
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT	

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
27-Sep_2012	23:14	352	TCC_CAM_40			Freshwater lens camera	81	324726	6094101	324742	6094127	16.32	26.30	31	212	AN	
27-Sep_2012	23:16	353	TCC_CAM_40			Freshwater lens camera	81	324724	6094097	324742	6094127	18.08	29.81	35	211	AN	
27-Sep_2012	23:18	354	TCC_CAM_40			Freshwater lens camera	81	324740	6094090	324742	6094127	1.87	36.84	35	182	AN	
27-Sep_2012	23:20	355	TCC_CAM_40			Freshwater lens camera	81	324740	6094092	324742	6094127	1.52	35.20	35	182	AN	
27-Sep_2012	23:20	356	TCC_CAM_40			Freshwater lens camera	81	324740	6094091	324742	6094127	2.25	36.40	36	184	AN	
27-Sep_2012	23:23	357	TCC_CAM_40			Freshwater lens camera	81	324738	6094090	324742	6094127	3.95	36.64	37	186	AN	
27-Sep_2012	23:28	358	TCC_CAM_40			Freshwater lens camera	81	324719	6094083	324742	6094127	23.34	44.01	50	208	AN	
27-Sep_2012	01:28	359	TCC_CAM_42			Freshwater lens camera	86	334766	6095151	334771	6095150	5.08	-1.37	5	285	AN	
27-Sep_2012	01:28	360	TCC_CAM_42			Freshwater lens camera	86	334769	6095150	334771	6095150	2.94	-0.04	3	271	AN	
27-Sep_2012	01:30	361	TCC_CAM_42			Freshwater lens camera	86	334769	6095157	334771	6095150	2.32	-6.54	7	341	AN	
27-Sep_2012	01:31	362	TCC_CAM_42			Freshwater lens camera	86	334764	6095159	334771	6095150	7.09	-8.63	11	321	AN	
27-Sep_2012	01:32	363	TCC_CAM_42			Freshwater lens camera	86	334760	6095159	334771	6095150	11.48	-8.92	15	308	AN	
27-Sep_2012	01:34	364	TCC_CAM_42			Freshwater lens camera	86	334749	6095164	334771	6095150	22.96	-13.59	27	301	AN	
27-Sep_2012	01:35	365	TCC_CAM_42			Freshwater lens camera	86	334748	6095166	334771	6095150	23.93	-16.16	29	304	AN	
27-Sep_2012	01:36	366	TCC_CAM_42			Freshwater lens camera	86	334746	6095171	334771	6095150	25.35	-20.84	33	309	AN	
27-Sep_2012	01:38	367	TCC_CAM_42			Freshwater lens camera	86	334751	6095173	334771	6095150	20.68	-23.36	21	318	AN	
27-Sep_2012	01:39	368	TCC_CAM_42			Freshwater lens camera	86	334754	6095171	334771	6095150	17.70	-21.28	28	320	AN	
27-Sep_2012	01:40	369	TCC_CAM_42			Freshwater lens camera	86	334759	6095176	334771	6095150	12.90	-26.05	29	334	AN	
27-Sep_2012	01:41	370	TCC_CAM_42			Freshwater lens camera	86	334763	6095178	334771	6095150	8.57	-27.95	29	343	AN	
27-Sep_2012	01:43	371	TCC_CAM_42			Freshwater lens camera	86	334775	6095177	334771	6095150	-3.21	-26.89	27	7	AN	
27-Sep_2012	01:44	372	TCC_CAM_42			Freshwater lens camera	86	334772	6095180	334771	6095150	-0.20	-29.71	30	0	AN	
27-Sep_2012	01:45	373	TCC_CAM_42			Freshwater lens camera	86	334775	6095179	334771	6095150	-3.94	-29.21	29	8	AN	
27-Sep_2012	01:46	374	TCC_CAM_42			Freshwater lens camera	86	334781	6095180	334771	6095150	-10.00	-30.09	32	19	AN	
01-Oct-2012	08:36	375	TCC_CAM_78			Freshwater lens camera	63	270626	6063240	270622	6063256	-4.17	15.66	16	165	AN	
01-Oct-2012	08:37	376	TCC_CAM_78			Freshwater lens camera	63	270620	6063253	270622	6063256	2.41	3.20	4	217	AN	
01-Oct-2012	08:38	377	TCC_CAM_78			Freshwater lens camera	63	270615	6063271	270622	6063256	6.93	-15.57	17	336	AN	
01-Oct-2012	08:39	378	TCC_CAM_78			Freshwater lens camera	9	270614	6063274	270622	6063256	8.38	-18.09	20	335	AN	Depth inaccurate due to bow thruster interference
01-Oct-2012	08:40	379	TCC_CAM_78			Freshwater lens camera	63	270609	6063270	270622	6063256	13.38	-14.30	20	317	AN	
01-Oct-2012	08:41	380	TCC_CAM_78			Freshwater lens camera	63	270599	6063269	270622	6063256	22.82	-13.15	26	300	AN	
01-Oct-2012	08:42	381	TCC_CAM_78			Freshwater lens camera	63	270595	6063269	270622	6063256	26.88	-12.78	30	295	AN	
01-Oct-2012	08:43	382	TCC_CAM_78			Freshwater lens camera	63	270600	6063327	270622	6063256	21.92	-71.13	74	343	AN	
01-Oct-2012	08:43	383	TCC_CAM_78			Freshwater lens camera	63	270602	6063321	270622	6063256	20.28	-65.14	68	343	AN	
01-Oct-2012	08:45	384	TCC_CAM_78			Freshwater lens camera	63	270603	6063302	270622	6063256	19.38	-46.07	50	337	AN	
01-Oct-2012	08:47	385	TCC_CAM_78			Freshwater lens camera	63	270607	6063301	270622	6063256	15.60	-45.21	48	341	AN	
01-Oct-2012	08:50	386	TCC_CAM_78			Freshwater lens camera	63	270598	6063283	270622	6063256	23.73	-26.79	36	318	AN	
01-Oct-2012	08:50	387	TCC_CAM_78			Freshwater lens camera	63	270598	6063284	270622	6063256	24.37	-27.65	37	319	AN	
01-Oct-2012	08:52	388	TCC_CAM_78			Freshwater lens camera	63	270624	6063287	270622	6063256	-1.47	-30.80	31	3	AN	
01-Oct-2012	09:36	389	TCC_CAM_79			Freshwater lens camera	62	274128	6063060	274153	6063035	24.69	-25.16	35	316	AN	
01-Oct-2012	09:37	390	TCC_CAM_79			Freshwater lens camera	62	274127	6063060	274153	6063035	25.04	-24.56	35	314	AN	

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Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
01-Oct-2012	09:38	391	TCC_CAM_79			Freshwater lens camera	62	274130	6063061	274153	6063035	22.95	-25.82	35	318	AN	
01-Oct-2012	09:39	392	TCC_CAM_79			Freshwater lens camera	62	274129	6063060	274153	6063035	23.36	-24.98	34	317	AN	
01-Oct-2012	09:40	393	TCC_CAM_79			Freshwater lens camera	62	274132	6063061	274153	6063035	20.73	-26.17	33	322	AN	
01-Oct-2012	09:41	394	TCC_CAM_79			Freshwater lens camera	62	274130	6063061	274153	6063035	22.80	-25.45	34	318	AN	
01-Oct-2012	09:42	395	TCC_CAM_79			Freshwater lens camera	62	274124	6063058	274153	6063035	28.99	-22.83	37	308	AN	
01-Oct-2012	09:43	396	TCC_CAM_79			Freshwater lens camera	62	274120	6063060	274153	6063035	32.09	-24.73	41	308	AN	
01-Oct-2012	09:44	397	TCC_CAM_79			Freshwater lens camera	62	274121	6063061	274153	6063035	31.16	-25.33	40	309	AN	
01-Oct-2012	09:45	398	TCC_CAM_79			Freshwater lens camera	10	274119	6063059	274153	6063035	33.65	-23.98	41	305	AN	Depth inaccurate due to bow thruster interference
01-Oct-2012	09:46	399	TCC_CAM_79			Freshwater lens camera	62	274109	6063049	274153	6063035	43.97	-13.29	46	287	AN	
01-Oct-2012	09:47	400	TCC_CAM_79			Freshwater lens camera	8	274125	6063061	274153	6063035	27.28	-25.60	37	313	AN	Depth inaccurate due to bow thruster interference
01-Oct-2012	09:50	401	TCC_CAM_79			Freshwater lens camera	62	274134	6063050	274153	6063035	18.96	-15.06	24	308	AN	
01-Oct-2012	09:51	402	TCC_CAM_79			Freshwater lens camera	62	274134	6063031	274153	6063035	18.42	3.76	19	258	AN	Camera drop point position used, due to poor beacon data
01-Oct-2012	09:52	403	TCC_CAM_79			Freshwater lens camera	62	274136	6063038	274153	6063035	16.19	-2.50	16	279	AN	Camera drop point position used, due to poor beacon data
01-Oct-2012	10:19	404	TCC_CAM_80			Freshwater lens camera	63	275041	6063060	275075	6063055	34.75	-5.00	35	278	AN	
01-Oct-2012	10:20	405	TCC_CAM_80			Freshwater lens camera	63	275046	6063066	275075	6063055	29.47	-10.26	31	289	AN	
01-Oct-2012	10:21	406	TCC_CAM_80			Freshwater lens camera	63	275056	6063066	275075	6063055	18.93	-11.14	22	300	AN	
01-Oct-2012	10:22	407	TCC_CAM_80			Freshwater lens camera	63	275050	6063066	275075	6063055	25.39	-10.75	28	293	AN	
01-Oct-2012	10:22	408	TCC_CAM_80			Freshwater lens camera	63	275052	6063066	275075	6063055	22.99	-11.00	25	296	AN	
01-Oct-2012	10:24	409	TCC_CAM_80			Freshwater lens camera	63	275058	6063064	275075	6063055	17.07	-8.70	19	297	AN	
01-Oct-2012	10:25	410	TCC_CAM_80			Freshwater lens camera	63	275055	6063051	275075	6063055	19.97	3.83	20	259	AN	
01-Oct-2012	10:39	411	TCC_CAM_80			Freshwater lens camera	63	275055	6063061	275075	6063055	20.54	-5.41	22	285	AN	
01-Oct-2012	10:39	412	TCC_CAM_80			Freshwater lens camera	63	275054	6063060	275075	6063055	21.18	-4.78	22	283	AN	
01-Oct-2012	10:40	413	TCC_CAM_80			Freshwater lens camera	63	275053	6063059	275075	6063055	22.44	-3.73	23	279	AN	
01-Oct-2012	10:41	414	TCC_CAM_80			Freshwater lens camera	63	275043	6063057	275075	6063055	32.32	-1.29	32	272	AN	
01-Oct-2012	10:43	415	TCC_CAM_80			Freshwater lens camera	63	275024	6063054	275075	6063055	50.90	1.55	51	268	AN	
01-Oct-2012	10:44	416	TCC_CAM_80			Freshwater lens camera	63	275020	6063040	275075	6063055	55.62	15.10	57	256	AN	
01-Oct-2012	10:44	417	TCC_CAM_80			Freshwater lens camera	63	275015	6063045	275075	6063055	59.81	10.09	61	260	AN	
01-Oct-2012	10:45	418	TCC_CAM_80			Freshwater lens camera	63	275007	6063041	275075	6063055	68.18	14.46	70	258	AN	
01-Oct-2012	11:25	419	TCC_CAM_81			Freshwater lens camera	61	275642	6063266	275657	6063256	14.47	-10.36	18	306	SKA	
01-Oct-2012	11:27	420	TCC_CAM_81			Freshwater lens camera	61	275645	6063259	275657	6063256	11.72	-3.60	12	287	SKA	
01-Oct-2012	11:27	421	TCC_CAM_81			Freshwater lens camera	61	275644	6063258	275657	6063256	12.95	-1.73	13	278	SKA	
01-Oct-2012	11:28	422	TCC_CAM_81			Freshwater lens camera	61	275643	6063256	275657	6063256	13.61	0.16	14	269	SKA	
01-Oct-2012	11:28	423	TCC_CAM_81			Freshwater lens camera	61	275646	6063253	275657	6063256	11.27	2.63	12	257	SKA	
01-Oct-2012	11:29	424	TCC_CAM_81			Freshwater lens camera	61	275649	6063254	275657	6063256	7.65	1.81	8	257	SKA	
01-Oct-2012	11:30	425	TCC_CAM_81			Freshwater lens camera	61	275649	6063254	275657	6063256	7.61	1.59	8	258	SKA	
01-Oct-2012	11:31	426	TCC_CAM_81			Freshwater lens camera	61	275649	6063255	275657	6063256	7.91	0.60	8	266	SKA	
01-Oct-2012	11:32	427	TCC_CAM_81			Freshwater lens camera	61	275650	6063258	275657	6063256	6.61	-2.34	7	289	SKA	
01-Oct-2012	11:32	428	TCC_CAM_81			Freshwater lens camera	61	275651	6063259	275657	6063256	6.08	-3.44	7	299	SKA	
01-Oct-2012	11:33	429	TCC_CAM_81			Freshwater lens camera	61	275651	6063261	275657	6063256	5.63	-4.72	7	310	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181					Vessel	Vigilant						
Client	Forewind Ltd					Vessel Reference Point (VRP)	COG						
Project Name	Teesside Cable Corridor Benthic Survey					Deployment Location		x	-6.54	y	-12.64	z	0
Primary Positioning System	Fugro Starpack XHP					Actual Coordinates derived from	Beacon						
Geodetic Reference System	Datum	WGS84		Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT	

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
01-Oct-2012	11:34	430	TCC_CAM_81			Freshwater lens camera	61	275653	6063260	275657	6063256	3.63	-4.11	5	319	SKA	
01-Oct-2012	11:34	431	TCC_CAM_81			Freshwater lens camera	61	275653	6063259	275657	6063256	4.31	-3.18	5	306	SKA	
01-Oct-2012	11:36	432	TCC_CAM_81			Freshwater lens camera	61	275657	6063254	275657	6063256	0.34	2.04	2	190	SKA	
01-Oct-2012	11:39	433	TCC_CAM_81			Freshwater lens camera	61	275677	6063234	275657	6063256	-19.55	21.98	29	138	SKA	
01-Oct-2012	11:42	434	TCC_CAM_81			Freshwater lens camera	61	275717	6063228	275657	6063256	-59.79	27.89	66	115	SKA	
01-Oct-2012	11:47	435	TCC_CAM_81			Freshwater lens camera	60	275760	6063241	275657	6063256	-102.64	14.54	104	98	SKA	
01-Oct-2012	11:49	436	TCC_CAM_81			Freshwater lens camera	60	275767	6063243	275657	6063256	-109.80	12.74	111	97	SKA	
01-Oct-2012	11:49	437	TCC_CAM_81			Freshwater lens camera	60	275770	6063240	275657	6063256	-112.89	15.58	114	98	SKA	
01-Oct-2012	11:50	438	TCC_CAM_81			Freshwater lens camera	60	275770	6063237	275657	6063256	-112.73	18.83	114	99	SKA	
01-Oct-2012	11:51	439	TCC_CAM_81			Freshwater lens camera	60	275770	6063216	275657	6063256	-113.20	39.98	120	109	SKA	
01-Oct-2012	11:52	440	TCC_CAM_81			Freshwater lens camera	60	275771	6063210	275657	6063256	-114.45	45.71	123	112	SKA	
01-Oct-2012	11:53	441	TCC_CAM_81			Freshwater lens camera	60	275771	6063210	275657	6063256	-114.44	45.76	123	112	SKA	
01-Oct-2012	11:53	442	TCC_CAM_81			Freshwater lens camera	60	275771	6063210	275657	6063256	-114.38	45.47	123	112	SKA	
01-Oct-2012	15:01	443	TCC_CAM_83			Freshwater lens camera	64	280557	6063703	280571	6063717	14.14	14.61	20	224	SKA	
01-Oct-2012	15:01	444	TCC_CAM_83			Freshwater lens camera	8	280557	6063702	280571	6063717	14.78	14.94	21	225	SKA	Depth inaccurate due to bow thruster interference
01-Oct-2012	15:03	445	TCC_CAM_83			Freshwater lens camera	64	280555	6063715	280571	6063717	16.00	2.21	16	262	SKA	Camera drop point position used, due to poor beacon data
01-Oct-2012	15:04	446	TCC_CAM_83			Freshwater lens camera	64	280561	6063718	280571	6063717	10.15	-0.28	10	272	SKA	
01-Oct-2012	15:05	447	TCC_CAM_83			Freshwater lens camera	64	280561	6063718	280571	6063717	10.49	-1.05	11	276	SKA	
01-Oct-2012	15:05	448	TCC_CAM_83			Freshwater lens camera	65	280560	6063720	280571	6063717	11.74	-2.90	12	284	SKA	
01-Oct-2012	15:05	449	TCC_CAM_83			Freshwater lens camera	65	280560	6063720	280571	6063717	11.32	-2.66	12	283	SKA	
01-Oct-2012	15:06	450	TCC_CAM_83			Freshwater lens camera	65	280560	6063720	280571	6063717	11.49	-3.02	12	285	SKA	
01-Oct-2012	15:07	451	TCC_CAM_83			Freshwater lens camera	65	280566	6063717	280571	6063717	5.61	0.10	6	269	SKA	
01-Oct-2012	15:07	452	TCC_CAM_83			Freshwater lens camera	8	280566	6063711	280571	6063717	5.38	6.54	8	219	SKA	Depth inaccurate due to bow thruster interference
01-Oct-2012	15:08	453	TCC_CAM_83			Freshwater lens camera	64	280552	6063680	280571	6063717	19.41	37.24	42	208	SKA	
01-Oct-2012	15:09	454	TCC_CAM_83			Freshwater lens camera	9	280564	6063713	280571	6063717	7.71	4.16	9	242	SKA	Camera drop point position used, due to poor beacon data
01-Oct-2012	15:09	455	TCC_CAM_83			Freshwater lens camera	11	280564	6063705	280571	6063717	7.85	11.96	14	213	SKA	Depth inaccurate due to bow thruster interference
01-Oct-2012	15:10	456	TCC_CAM_83			Freshwater lens camera	65	280571	6063715	280571	6063717	0.38	1.85	2	192	SKA	
01-Oct-2012	15:10	457	TCC_CAM_83			Freshwater lens camera	65	280573	6063721	280571	6063717	-1.78	-3.66	4	26	SKA	
01-Oct-2012	15:12	458	TCC_CAM_83			Freshwater lens camera	65	280567	6063727	280571	6063717	4.12	-9.34	10	336	SKA	
01-Oct-2012	15:13	459	TCC_CAM_83			Freshwater lens camera	65	280563	6063721	280571	6063717	8.72	-3.83	10	294	SKA	
01-Oct-2012	15:14	460	TCC_CAM_83			Freshwater lens camera	65	280561	6063711	280571	6063717	10.58	6.70	13	238	SKA	
01-Oct-2012	15:15	461	TCC_CAM_83			Freshwater lens camera	65	280556	6063704	280571	6063717	15.92	13.12	21	231	SKA	
01-Oct-2012	15:17	462	TCC_CAM_83			Freshwater lens camera	64	280571	6063711	280571	6063717	0.12	6.07	6	181	SKA	
01-Oct-2012	15:18	463	TCC_CAM_83			Freshwater lens camera	65	280575	6063718	280571	6063717	-3.17	-1.22	3	69	SKA	
01-Oct-2012	16:00	464	TCC_CAM_82			Freshwater lens camera	68	279834	6063460	279849	6063517	15.23	56.32	58	195	SKA	
01-Oct-2012	16:00	465	TCC_CAM_82			Freshwater lens camera	68	279712	6063474	279849	6063517	137.55	42.17	144	253	SKA	
01-Oct-2012	16:01	466	TCC_CAM_82			Freshwater lens camera	68	279846	6063511	279849	6063517	3.30	5.66	7	210	SKA	
01-Oct-2012	16:01	467	TCC_CAM_82			Freshwater lens camera	68	279841	6063511	279849	6063517	8.75	5.33	10	239	SKA	
01-Oct-2012	16:02	468	TCC_CAM_82			Freshwater lens camera	62	279840	6063502	279849	6063517	9.24	14.33	17	213	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181			Vessel	Vigilant							
Client	Forewind Ltd			Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey			Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP			Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
01-Oct-2012	16:03	469	TCC_CAM_82			Freshwater lens camera	68	279838	6063493	279849	6063517	11.81	24.11	27	206	SKA	
01-Oct-2012	16:05	470	TCC_CAM_82			Freshwater lens camera	8	279843	6063482	279849	6063517	5.91	34.87	35	190	SKA	Depth inaccurate due to bow thruster interference
01-Oct-2012	16:07	471	TCC_CAM_82			Freshwater lens camera	68	279852	6063499	279849	6063517	-2.65	17.86	18	172	SKA	
01-Oct-2012	16:09	472	TCC_CAM_82			Freshwater lens camera	9	279843	6063500	279849	6063517	5.93	16.57	18	200	SKA	Depth inaccurate due to bow thruster interference
01-Oct-2012	16:09	473	TCC_CAM_82			Freshwater lens camera	9	279845	6063497	279849	6063517	4.24	19.68	20	192	SKA	Depth inaccurate due to bow thruster interference
01-Oct-2012	16:10	474	TCC_CAM_82			Freshwater lens camera	10	279846	6063499	279849	6063517	3.38	17.97	18	191	SKA	Depth inaccurate due to bow thruster interference
01-Oct-2012	16:12	475	TCC_CAM_82			Freshwater lens camera	68	279860	6063509	279849	6063517	-11.08	7.88	14	125	SKA	
01-Oct-2012	16:13	476	TCC_CAM_82			Freshwater lens camera	68	279859	6063520	279849	6063517	-9.91	-2.89	10	74	SKA	
01-Oct-2012	16:14	477	TCC_CAM_82			Freshwater lens camera	68	279854	6063522	279849	6063517	-4.39	-5.06	7	41	SKA	
01-Oct-2012	16:14	478	TCC_CAM_82			Freshwater lens camera	68	279849	6063516	279849	6063517	0.64	0.58	1	228	SKA	
01-Oct-2012	18:04	479	TCC_CAM_84			Freshwater lens camera	8	284625	6065070	284583	6065021	-42.09	-48.66	64	41	SKA	Depth inaccurate due to bow thruster interference
01-Oct-2012	18:06	480	TCC_CAM_84			Freshwater lens camera	69	284598	6064993	284583	6065021	-14.85	28.17	32	152	SKA	Beacon fix inaccurate due to bow thruster interference
01-Oct-2012	18:08	481	TCC_CAM_84			Freshwater lens camera	69	284602	6065017	284583	6065021	-18.52	3.67	19	101	SKA	Beacon fix inaccurate due to bow thruster interference
01-Oct-2012	18:09	482	TCC_CAM_84			Freshwater lens camera	69	284571	6065005	284583	6065021	12.59	16.22	21	218	SKA	Camera drop point position used, due to poor beacon data
01-Oct-2012	18:10	483	TCC_CAM_84			Freshwater lens camera	69	284567	6065008	284583	6065021	15.93	13.30	15	208	SKA	
01-Oct-2012	18:12	484	TCC_CAM_84			Freshwater lens camera	69	284560	6065020	284583	6065021	23.33	1.04	24	270	SKA	
01-Oct-2012	18:14	485	TCC_CAM_84			Freshwater lens camera	69	284587	6065017	284583	6065021	-3.49	4.05	17	294	SKA	
01-Oct-2012	18:15	486	TCC_CAM_84			Freshwater lens camera	9	284598	6065016	284583	6065021	-15.13	5.42	7	317	SKA	
01-Oct-2012	18:15	487	TCC_CAM_84			Freshwater lens camera	69	284598	6065015	284583	6065021	-15.13	6.33	7	316	SKA	
01-Oct-2012	18:17	488	TCC_CAM_84			Freshwater lens camera	69	284608	6065009	284583	6065021	-24.23	12.41	10	116	SKA	
01-Oct-2012	18:48	489	TCC_CAM_85			Freshwater lens camera	73	286192	6065246	286188	6065242	-4.13	-4.19	6	45	SKA	
01-Oct-2012	18:50	490	TCC_CAM_85			Freshwater lens camera	73	286190	6065240	286188	6065242	-2.15	1.68	3	128	SKA	
01-Oct-2012	18:52	491	TCC_CAM_85			Freshwater lens camera	73	286211	6065247	286188	6065242	-22.95	-4.79	23	78	SKA	
01-Oct-2012	18:54	492	TCC_CAM_85			Freshwater lens camera	73	286215	6065246	286188	6065242	-27.13	-4.47	28	81	SKA	
01-Oct-2012	18:56	493	TCC_CAM_85			Freshwater lens camera	73	286177	6065227	286188	6065242	11.41	14.87	19	218	SKA	Camera drop point position used, due to poor beacon data
01-Oct-2012	18:58	494	TCC_CAM_85			Freshwater lens camera	73	286181	6065228	286188	6065242	6.84	14.07	16	206	SKA	
01-Oct-2012	18:59	495	TCC_CAM_85			Freshwater lens camera	73	286165	6065222	286188	6065242	22.79	19.50	30	229	SKA	
01-Oct-2012	19:05	496	TCC_CAM_85			Freshwater lens camera	73	286195	6065240	286188	6065242	-7.07	1.92	7	105	SKA	
01-Oct-2012	20:56	497	TCC_CAM_86			Freshwater lens camera	73	291651	6065769	291664	6065743	13.26	-26.11	29	333	SKA	
01-Oct-2012	20:57	498	TCC_CAM_86			Freshwater lens camera	73	291650	6065770	291664	6065743	14.43	-26.70	30	332	SKA	
01-Oct-2012	21:05	499	TCC_CAM_86			Freshwater lens camera	73	291676	6065769	291664	6065743	-11.33	-25.68	28	24	SKA	
04-Oct-2012	10:44	500	TCC_CAM_86			Freshwater lens camera	73	291670	6065771	291664	6065743	-6.18	-28.04	29	12	AN	
04-Oct-2012	10:45	501	TCC_CAM_86			Freshwater lens camera	73	291668	6065769	291664	6065743	-4.02	-25.76	26	9	AN	
04-Oct-2012	10:46	502	TCC_CAM_86			Freshwater lens camera	73	291668	6065768	291664	6065743	-3.34	-24.56	25	8	AN	
04-Oct-2012	10:48	503	TCC_CAM_86			Freshwater lens camera	73	291671	6065772	291664	6065743	-6.38	-28.80	30	12	AN	
04-Oct-2012	10:49	504	TCC_CAM_86			Freshwater lens camera	73	291672	6065773	291664	6065743	-8.07	-30.25	31	15	AN	
04-Oct-2012	10:51	505	TCC_CAM_86			Freshwater lens camera	73	291669	6065771	291664	6065743	-4.46	-27.83	28	9	AN	
04-Oct-2012	10:52	506	TCC_CAM_86			Freshwater lens camera	73	291664	6065771	291664	6065743	0.02	-27.91	28	360	AN	
04-Oct-2012	10:53	507	TCC_CAM_86			Freshwater lens camera	73	291659	6065766	291664	6065743	4.91	-23.01	24	348	AN	

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Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
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Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
04-Oct-2012	10:54	508	TCC_CAM_86			Freshwater lens camera	73	291649	6065756	291664	6065743	15.69	-12.41	20	308	AN	
04-Oct-2012	10:55	509	TCC_CAM_86			Freshwater lens camera	73	291644	6065753	291664	6065743	19.91	-9.75	22	296	AN	
04-Oct-2012	10:56	510	TCC_CAM_86			Freshwater lens camera	73	291643	6065750	291664	6065743	21.31	-7.03	22	288	AN	
04-Oct-2012	10:58	511	TCC_CAM_86			Freshwater lens camera	73	291634	6065743	291664	6065743	29.74	0.45	30	269	AN	
04-Oct-2012	10:59	512	TCC_CAM_86			Freshwater lens camera	73	291628	6065737	291664	6065743	36.18	5.99	37	261	AN	
04-Oct-2012	11:01	513	TCC_CAM_86			Freshwater lens camera	73	291625	6065741	291664	6065743	39.26	2.40	39	267	AN	
04-Oct-2012	12:35	514	TCC_CAM_87			Freshwater lens camera	68	300617	6066924	300631	6066887	13.77	-37.79	40	340	SKA	
04-Oct-2012	12:37	515	TCC_CAM_87			Freshwater lens camera	68	300618	6066911	300631	6066887	13.14	-24.25	28	332	SKA	
04-Oct-2012	12:38	516	TCC_CAM_87			Freshwater lens camera	68	300621	6066905	300631	6066887	9.89	-18.32	21	332	SKA	
04-Oct-2012	12:39	517	TCC_CAM_87			Freshwater lens camera	68	300620	6066905	300631	6066887	10.69	-18.67	22	330	SKA	
04-Oct-2012	12:40	518	TCC_CAM_87			Freshwater lens camera	68	300620	6066908	300631	6066887	10.39	-20.92	23	334	SKA	
04-Oct-2012	12:41	519	TCC_CAM_87			Freshwater lens camera	68	300622	6066904	300631	6066887	8.28	-17.17	19	334	SKA	
04-Oct-2012	12:42	520	TCC_CAM_87			Freshwater lens camera	68	300625	6066900	300631	6066887	5.96	-13.25	15	336	SKA	
04-Oct-2012	12:44	521	TCC_CAM_87			Freshwater lens camera	68	300629	6066892	300631	6066887	1.91	-5.82	6	342	SKA	
04-Oct-2012	12:45	522	TCC_CAM_87			Freshwater lens camera	68	300627	6066895	300631	6066887	3.38	-8.23	9	338	SKA	
04-Oct-2012	12:46	523	TCC_CAM_87			Freshwater lens camera	68	300631	6066896	300631	6066887	-0.61	-9.33	9	4	SKA	
04-Oct-2012	12:47	524	TCC_CAM_87			Freshwater lens camera	68	300631	6066894	300631	6066887	-0.71	-7.63	8	5	SKA	
04-Oct-2012	12:49	525	TCC_CAM_87			Freshwater lens camera	68	300634	6066886	300631	6066887	-3.06	1.10	3	110	SKA	
04-Oct-2012	13:51	526	TCC_CAM_88			Freshwater lens camera	78	304782	6066719	304783	6066706	1.23	-12.69	13	354	SKA	
04-Oct-2012	13:52	527	TCC_CAM_88			Freshwater lens camera	78	304783	6066735	304783	6066706	-0.47	-29.22	29	1	SKA	
04-Oct-2012	13:53	528	TCC_CAM_88			Freshwater lens camera	78	304785	6066739	304783	6066706	-2.19	-33.30	33	4	SKA	
04-Oct-2012	13:54	529	TCC_CAM_88			Freshwater lens camera	78	304787	6066740	304783	6066706	-4.32	-33.56	34	7	SKA	
04-Oct-2012	13:55	530	TCC_CAM_88			Freshwater lens camera	78	304784	6066732	304783	6066706	-0.82	-26.31	26	2	SKA	
04-Oct-2012	13:57	531	TCC_CAM_88			Freshwater lens camera	78	304780	6066728	304783	6066706	3.25	-21.61	22	351	SKA	
04-Oct-2012	13:58	532	TCC_CAM_88			Freshwater lens camera	78	304782	6066734	304783	6066706	1.36	-28.18	28	357	SKA	
04-Oct-2012	13:58	533	TCC_CAM_88			Freshwater lens camera	78	304782	6066735	304783	6066706	1.39	-28.49	29	357	SKA	
04-Oct-2012	14:01	534	TCC_CAM_88			Freshwater lens camera	78	304785	6066728	304783	6066706	-1.99	-22.20	22	5	SKA	
04-Oct-2012	14:02	535	TCC_CAM_88			Freshwater lens camera	78	304783	6066723	304783	6066706	-0.37	-16.49	16	1	SKA	
04-Oct-2012	14:04	536	TCC_CAM_88			Freshwater lens camera	78	304784	6066718	304783	6066706	-1.16	-11.65	12	6	SKA	
04-Oct-2012	14:05	537	TCC_CAM_88			Freshwater lens camera	78	304786	6066718	304783	6066706	-3.25	-11.92	12	15	SKA	
04-Oct-2012	14:06	538	TCC_CAM_88			Freshwater lens camera	78	304787	6066713	304783	6066706	-4.25	-6.48	8	33	SKA	
04-Oct-2012	14:47	539	TCC_CAM_89			Freshwater lens camera	79	307345	6066751	307310	6066746	-34.62	-5.03	35	82	SKA	
04-Oct-2012	14:48	540	TCC_CAM_89			Freshwater lens camera	79	307342	6066746	307310	6066746	-31.80	-0.20	32	90	SKA	
04-Oct-2012	14:48	541	TCC_CAM_89			Freshwater lens camera	79	307342	6066746	307310	6066746	-31.81	-0.03	32	90	SKA	
04-Oct-2012	14:50	542	TCC_CAM_89			Freshwater lens camera	79	307349	6066740	307310	6066746	-38.68	6.34	39	99	SKA	
04-Oct-2012	14:50	543	TCC_CAM_89			Freshwater lens camera	79	307349	6066740	307310	6066746	-38.37	6.40	39	99	SKA	
04-Oct-2012	14:51	544	TCC_CAM_89			Freshwater lens camera	79	307345	6066739	307310	6066746	-34.88	7.31	36	102	SKA	
04-Oct-2012	14:51	545	TCC_CAM_89			Freshwater lens camera	78	307341	6066739	307310	6066746	-30.76	7.40	32	104	SKA	
04-Oct-2012	14:53	546	TCC_CAM_89			Freshwater lens camera	78	307335	6066740	307310	6066746	-25.02	6.63	26	105	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
04-Oct-2012	14:54	547	TCC_CAM_89			Freshwater lens camera	79	307336	6066741	307310	6066746	-25.88	5.60	26	102	SKA	
04-Oct-2012	14:55	548	TCC_CAM_89			Freshwater lens camera	78	307333	6066741	307310	6066746	-22.63	5.28	23	103	SKA	
04-Oct-2012	14:55	549	TCC_CAM_89			Freshwater lens camera	78	307331	6066741	307310	6066746	-21.08	4.98	22	103	SKA	
04-Oct-2012	14:55	550	TCC_CAM_89			Freshwater lens camera	78	307330	6066741	307310	6066746	-19.11	5.16	20	105	SKA	
04-Oct-2012	14:56	551	TCC_CAM_89			Freshwater lens camera	78	307330	6066740	307310	6066746	-19.09	5.96	20	107	SKA	
04-Oct-2012	14:56	552	TCC_CAM_89			Freshwater lens camera	78	307330	6066740	307310	6066746	-19.88	6.14	21	107	SKA	
04-Oct-2012	14:57	553	TCC_CAM_89			Freshwater lens camera	78	307330	6066740	307310	6066746	-19.53	6.05	20	107	SKA	
04-Oct-2012	14:57	554	TCC_CAM_89			Freshwater lens camera	78	307330	6066740	307310	6066746	-19.65	6.09	21	107	SKA	
04-Oct-2012	14:57	555	TCC_CAM_89			Freshwater lens camera	78	307330	6066740	307310	6066746	-19.48	5.85	20	107	SKA	
04-Oct-2012	14:59	556	TCC_CAM_89			Freshwater lens camera	78	307319	6066741	307310	6066746	-8.94	5.48	10	122	SKA	
04-Oct-2012	15:00	557	TCC_CAM_89			Freshwater lens camera	78	307317	6066740	307310	6066746	-6.64	6.45	9	134	SKA	
04-Oct-2012	15:00	558	TCC_CAM_89			Freshwater lens camera	78	307318	6066740	307310	6066746	-7.19	6.34	10	131	SKA	
04-Oct-2012	15:01	559	TCC_CAM_89			Freshwater lens camera	79	307328	6066739	307310	6066746	-17.46	7.64	19	114	SKA	
04-Oct-2012	15:04	560	TCC_CAM_89			Freshwater lens camera	78	307330	6066733	307310	6066746	-19.82	13.02	24	123	SKA	
04-Oct-2012	15:05	561	TCC_CAM_89			Freshwater lens camera	78	307321	6066726	307310	6066746	-10.73	19.70	22	151	SKA	
04-Oct-2012	15:05	562	TCC_CAM_89			Freshwater lens camera	79	307323	6066728	307310	6066746	-12.89	18.48	23	145	SKA	
04-Oct-2012	15:07	563	TCC_CAM_89			Freshwater lens camera	79	307327	6066727	307310	6066746	-16.49	19.33	25	140	SKA	
04-Oct-2012	15:07	564	TCC_CAM_89			Freshwater lens camera	79	307326	6066728	307310	6066746	-15.89	17.96	24	138	SKA	
04-Oct-2012	15:07	565	TCC_CAM_89			Freshwater lens camera	79	307325	6066727	307310	6066746	-14.52	19.25	24	143	SKA	
04-Oct-2012	15:10	566	TCC_CAM_89			Freshwater lens camera	78	307325	6066727	307310	6066746	-14.20	19.24	24	144	SKA	
04-Oct-2012	15:11	567	TCC_CAM_89			Freshwater lens camera	79	307325	6066726	307310	6066746	-14.43	20.20	25	144	SKA	
04-Oct-2012	15:11	568	TCC_CAM_89			Freshwater lens camera	79	307327	6066727	307310	6066746	-17.05	19.06	26	138	SKA	
04-Oct-2012	15:11	569	TCC_CAM_89			Freshwater lens camera	79	307331	6066726	307310	6066746	-20.52	20.09	29	134	SKA	
04-Oct-2012	15:49	570	TCC_CAM_90			Freshwater lens camera	80	309235	6066849	309236	6066867	0.77	18.02	18	182	SKA	
04-Oct-2012	15:51	571	TCC_CAM_90			Freshwater lens camera	80	309214	6066859	309236	6066867	21.99	7.10	23	252	SKA	
04-Oct-2012	15:53	572	TCC_CAM_90			Freshwater lens camera	80	309242	6066844	309236	6066867	-5.80	22.07	23	165	SKA	
04-Oct-2012	15:54	573	TCC_CAM_90			Freshwater lens camera	79	309242	6066837	309236	6066867	-5.85	29.89	30	169	SKA	
04-Oct-2012	15:56	574	TCC_CAM_90			Freshwater lens camera	81	309215	6066837	309236	6066867	20.96	30.01	37	215	SKA	
04-Oct-2012	15:56	575	TCC_CAM_90			Freshwater lens camera	81	309213	6066837	309236	6066867	23.00	29.37	37	218	SKA	
04-Oct-2012	15:57	576	TCC_CAM_90			Freshwater lens camera	81	309203	6066841	309236	6066867	32.65	25.10	41	232	SKA	
04-Oct-2012	16:05	577	TCC_CAM_90			Freshwater lens camera	81	309239	6066847	309236	6066867	-2.77	19.92	20	172	SKA	
04-Oct-2012	16:51	578	TCC_CAM_91			Freshwater lens camera	70	309735	6067754	309738	6067789	2.99	35.70	36	185	SKA	
04-Oct-2012	16:52	579	TCC_CAM_91			Freshwater lens camera	70	309744	6067771	309738	6067789	-6.26	18.06	19	161	SKA	
04-Oct-2012	16:54	580	TCC_CAM_91			Freshwater lens camera	70	309765	6067781	309738	6067789	-26.94	8.26	28	107	SKA	
04-Oct-2012	16:55	581	TCC_CAM_91			Freshwater lens camera	70	309726	6067801	309738	6067789	11.54	-12.03	17	316	SKA	
04-Oct-2012	16:56	582	TCC_CAM_91			Freshwater lens camera	70	309780	6067783	309738	6067789	-42.76	6.57	43	99	SKA	
04-Oct-2012	16:58	583	TCC_CAM_91			Freshwater lens camera	71	309774	6067790	309738	6067789	-36.67	-0.98	37	88	SKA	
04-Oct-2012	16:59	584	TCC_CAM_91			Freshwater lens camera	70	309758	6067786	309738	6067789	-20.63	3.53	21	100	SKA	
04-Oct-2012	17:00	585	TCC_CAM_91			Freshwater lens camera	70	309750	6067771	309738	6067789	-12.89	17.96	22	144	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181			Vessel	Vigilant							
Client	Forewind Ltd			Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey			Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP			Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
04-Oct-2012	17:01	586	TCC_CAM_91			Freshwater lens camera	8	309758	6067746	309738	6067789	-20.81	43.61	48	154	SKA	Depth inaccurate due to bow thruster interference
04-Oct-2012	17:02	587	TCC_CAM_91			Freshwater lens camera	70	309738	6067763	309738	6067789	-0.09	26.26	26	180	SKA	
04-Oct-2012	17:04	588	TCC_CAM_91			Freshwater lens camera	70	309734	6067773	309738	6067789	3.19	16.17	16	191	SKA	
04-Oct-2012	17:04	589	TCC_CAM_91			Freshwater lens camera	70	309736	6067781	309738	6067789	1.69	8.52	9	191	SKA	
04-Oct-2012	17:05	590	TCC_CAM_91			Freshwater lens camera	70	309742	6067780	309738	6067789	-4.71	8.98	10	152	SKA	
04-Oct-2012	17:06	591	TCC_CAM_91			Freshwater lens camera	70	309742	6067781	309738	6067789	-4.89	8.48	10	150	SKA	
04-Oct-2012	17:06	592	TCC_CAM_91			Freshwater lens camera	70	309742	6067780	309738	6067789	-4.74	9.19	10	153	SKA	
04-Oct-2012	17:07	593	TCC_CAM_91			Freshwater lens camera	70	309736	6067777	309738	6067789	1.45	11.97	12	187	SKA	
04-Oct-2012	17:07	594	TCC_CAM_91			Freshwater lens camera	70	309736	6067778	309738	6067789	1.63	11.60	12	188	SKA	
04-Oct-2012	17:09	595	TCC_CAM_91			Freshwater lens camera	70	309759	6067765	309738	6067789	-21.06	24.23	32	139	SKA	
04-Oct-2012	17:34	596	TCC_CAM_92			Freshwater lens camera	74	310410	6067815	310400	6067829	-10.16	13.92	17	144	SKA	
04-Oct-2012	17:36	597	TCC_CAM_92			Freshwater lens camera	74	310385	6067823	310400	6067829	14.04	6.10	15	247	SKA	
04-Oct-2012	17:39	598	TCC_CAM_92			Freshwater lens camera	66	310400	6067832	310400	6067829	-0.76	-2.33	2	18	SKA	
04-Oct-2012	17:40	599	TCC_CAM_92			Freshwater lens camera	8	310400	6067832	310400	6067829	-0.76	-2.33	2	18	SKA	Depth inaccurate due to bow thruster interference
04-Oct-2012	17:43	600	TCC_CAM_92			Freshwater lens camera	74	310412	6067817	310400	6067829	-12.23	12.37	17	135	SKA	
04-Oct-2012	17:44	601	TCC_CAM_92			Freshwater lens camera	11	310428	6067803	310400	6067829	-28.72	26.29	39	132	SKA	Depth inaccurate due to bow thruster interference
04-Oct-2012	17:45	602	TCC_CAM_92			Freshwater lens camera	8	310450	6067865	310400	6067829	-50.07	-35.60	61	55	SKA	Depth inaccurate due to bow thruster interference
04-Oct-2012	17:47	603	TCC_CAM_92			Freshwater lens camera	74	310425	6067819	310400	6067829	-25.84	10.01	28	111	SKA	
04-Oct-2012	17:48	604	TCC_CAM_92			Freshwater lens camera	74	310416	6067828	310400	6067829	-16.22	1.87	16	97	SKA	
04-Oct-2012	17:51	605	TCC_CAM_92			Freshwater lens camera	74	310393	6067828	310400	6067829	6.92	1.07	7	261	SKA	
04-Oct-2012	18:19	606	TCC_CAM_93			Freshwater lens camera	76	311185	6067953	311162	6067950	-22.79	-3.49	23	81	SKA	
04-Oct-2012	18:20	607	TCC_CAM_93			Freshwater lens camera	75	311176	6067959	311162	6067950	-14.59	-8.97	17	58	SKA	
04-Oct-2012	18:23	608	TCC_CAM_93			Freshwater lens camera	75	311157	6067959	311162	6067950	4.94	-9.73	11	333	SKA	
04-Oct-2012	18:24	609	TCC_CAM_93			Freshwater lens camera	76	311168	6067953	311162	6067950	-5.72	-3.17	7	61	SKA	
04-Oct-2012	18:27	610	TCC_CAM_93			Freshwater lens camera	75	311160	6067928	311162	6067950	1.69	21.29	21	185	SKA	
04-Oct-2012	18:32	611	TCC_CAM_93			Freshwater lens camera	75	311166	6067966	311162	6067950	-4.13	-15.88	16	15	SKA	
04-Oct-2012	18:33	612	TCC_CAM_93			Freshwater lens camera	75	311155	6067970	311162	6067950	6.79	-20.16	21	341	SKA	
04-Oct-2012	18:33	613	TCC_CAM_93			Freshwater lens camera	75	311155	6067969	311162	6067950	6.64	-19.65	21	341	SKA	
04-Oct-2012	18:34	614	TCC_CAM_93			Freshwater lens camera	75	311146	6067963	311162	6067950	15.99	-13.70	21	311	SKA	
04-Oct-2012	18:35	615	TCC_CAM_93			Freshwater lens camera	75	311145	6067959	311162	6067950	16.97	-9.53	19	299	SKA	
04-Oct-2012	19:06	616	TCC_CAM_94			Freshwater lens camera	79	311988	6068099	311964	6068110	-23.62	11.21	26	115	SKA	
04-Oct-2012	19:09	617	TCC_CAM_94			Freshwater lens camera	79	311963	6068105	311964	6068110	1.19	4.98	5	193	SKA	
04-Oct-2012	19:10	618	TCC_CAM_94			Freshwater lens camera	79	311959	6068104	311964	6068110	5.17	5.98	8	221	SKA	
04-Oct-2012	19:12	619	TCC_CAM_94			Freshwater lens camera	79	311974	6068100	311964	6068110	-9.43	9.83	14	136	SKA	
04-Oct-2012	19:14	620	TCC_CAM_94			Freshwater lens camera	79	311965	6068091	311964	6068110	-0.94	19.62	20	177	SKA	
04-Oct-2012	19:16	621	TCC_CAM_94			Freshwater lens camera	79	311958	6068101	311964	6068110	6.45	9.39	11	215	SKA	
04-Oct-2012	19:17	622	TCC_CAM_94			Freshwater lens camera	79	311942	6068110	311964	6068110	21.82	-0.09	22	270	SKA	
04-Oct-2012	19:17	623	TCC_CAM_94			Freshwater lens camera	79	311942	6068110	311964	6068110	21.79	-0.03	22	270	SKA	
04-Oct-2012	19:20	624	TCC_CAM_94			Freshwater lens camera	79	311935	6068107	311964	6068110	29.56	3.19	30	264	SKA	

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Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
04-Oct-2012	19:22	625	TCC_CAM_94			Freshwater lens camera	79	311947	6068104	311964	6068110	17.17	6.42	18	250	SKA	
04-Oct-2012	19:22	626	TCC_CAM_94			Freshwater lens camera	79	311948	6068104	311964	6068110	16.22	6.41	17	248	SKA	
04-Oct-2012	19:24	627	TCC_CAM_94			Freshwater lens camera	79	311995	6068100	311964	6068110	-30.90	9.93	32	108	SKA	
04-Oct-2012	21:33	628	TCC_CAM_95			Freshwater lens camera	77	314251	6067495	314271	6067468	19.72	-26.97	33	324	SKA	
04-Oct-2012	21:35	629	TCC_CAM_95			Freshwater lens camera	77	314261	6067478	314271	6067468	9.83	-9.37	14	314	SKA	
04-Oct-2012	21:36	630	TCC_CAM_95			Freshwater lens camera	77	314273	6067470	314271	6067468	-1.57	-1.85	2	40	SKA	
04-Oct-2012	21:37	631	TCC_CAM_95			Freshwater lens camera	77	314281	6067470	314271	6067468	-10.25	-2.07	10	79	SKA	
04-Oct-2012	21:40	632	TCC_CAM_95			Freshwater lens camera	77	314297	6067498	314271	6067468	-25.96	-29.51	39	41	SKA	
04-Oct-2012	21:40	633	TCC_CAM_95			Freshwater lens camera	77	314296	6067498	314271	6067468	-24.95	-29.27	38	40	SKA	
04-Oct-2012	21:41	634	TCC_CAM_95			Freshwater lens camera	77	314268	6067495	314271	6067468	3.35	-26.96	27	353	SKA	
04-Oct-2012	21:44	635	TCC_CAM_95			Freshwater lens camera	77	314266	6067451	314271	6067468	5.43	17.23	18	197	SKA	
04-Oct-2012	21:47	636	TCC_CAM_95			Freshwater lens camera	77	314286	6067473	314271	6067468	-15.00	-4.66	16	73	SKA	
04-Oct-2012	21:50	637	TCC_CAM_95			Freshwater lens camera	77	314290	6067452	314271	6067468	-19.19	16.27	25	130	SKA	
04-Oct-2012	22:19	638	TCC_CAM_96			Freshwater lens camera	75	315602	6068608	315595	6068592	-7.42	-16.17	18	25	SKA	
04-Oct-2012	22:21	639	TCC_CAM_96			Freshwater lens camera	74	315607	6068629	315595	6068592	-12.34	-37.83	40	18	SKA	
04-Oct-2012	22:21	640	TCC_CAM_96			Freshwater lens camera	74	315608	6068630	315595	6068592	-13.62	-37.95	40	20	SKA	
04-Oct-2012	22:24	641	TCC_CAM_96			Freshwater lens camera	76	315570	6068645	315595	6068592	24.99	-53.08	59	335	SKA	
04-Oct-2012	22:27	642	TCC_CAM_96			Freshwater lens camera	75	315593	6068621	315595	6068592	2.34	-29.15	29	355	SKA	
04-Oct-2012	22:28	643	TCC_CAM_96			Freshwater lens camera	63	315615	6068630	315595	6068592	-19.94	-38.77	44	27	SKA	
04-Oct-2012	22:30	644	TCC_CAM_96			Freshwater lens camera	74	315596	6068631	315595	6068592	-1.00	-39.11	39	1	SKA	
04-Oct-2012	22:30	645	TCC_CAM_96			Freshwater lens camera	75	315595	6068637	315595	6068592	0.33	-45.84	46	360	SKA	
04-Oct-2012	22:32	646	TCC_CAM_96			Freshwater lens camera	75	315582	6068638	315595	6068592	13.19	-46.20	48	344	SKA	
04-Oct-2012	22:33	647	TCC_CAM_96			Freshwater lens camera	75	315583	6068632	315595	6068592	11.69	-39.91	42	344	SKA	
04-Oct-2012	22:35	648	TCC_CAM_96			Freshwater lens camera	75	315587	6068619	315595	6068592	7.44	-27.32	28	345	SKA	
04-Oct-2012	22:36	649	TCC_CAM_96			Freshwater lens camera	75	315588	6068617	315595	6068592	7.22	-25.05	26	344	SKA	
04-Oct-2012	22:36	650	TCC_CAM_96			Freshwater lens camera	75	315588	6068616	315595	6068592	7.09	-24.59	26	344	SKA	
04-Oct-2012	22:37	651	TCC_CAM_96			Freshwater lens camera	75	315585	6068609	315595	6068592	9.64	-17.31	20	331	SKA	
04-Oct-2012	22:38	652	TCC_CAM_96			Freshwater lens camera	76	315577	6068601	315595	6068592	17.86	-9.37	20	298	SKA	
04-Oct-2012	22:39	653	TCC_CAM_96			Freshwater lens camera	76	315563	6068597	315595	6068592	31.60	-5.48	32	280	SKA	
04-Oct-2012	22:40	654	TCC_CAM_96			Freshwater lens camera	75	315561	6068606	315595	6068592	33.64	-14.49	37	293	SKA	
04-Oct-2012	22:40	655	TCC_CAM_96			Freshwater lens camera	75	315562	6068607	315595	6068592	32.78	-15.82	36	296	SKA	
04-Oct-2012	23:07	656	TCC_CAM_97			Freshwater lens camera	72	315943	6068669	315956	6068632	13.25	-37.52	40	341	AN	
04-Oct-2012	23:09	657	TCC_CAM_97			Freshwater lens camera	72	315940	6068666	315956	6068632	15.66	-34.29	38	335	AN	
04-Oct-2012	23:09	658	TCC_CAM_97			Freshwater lens camera	72	315941	6068663	315956	6068632	15.31	-31.44	35	334	AN	
04-Oct-2012	23:10	659	TCC_CAM_97			Freshwater lens camera	72	315943	6068661	315956	6068632	13.04	-29.05	32	336	AN	
04-Oct-2012	23:12	660	TCC_CAM_97			Freshwater lens camera	72	315947	6068662	315956	6068632	9.30	-30.25	32	343	AN	
04-Oct-2012	23:13	661	TCC_CAM_97			Freshwater lens camera	72	315955	6068664	315956	6068632	1.32	-31.91	32	358	AN	
04-Oct-2012	23:14	662	TCC_CAM_97			Freshwater lens camera	10	315957	6068663	315956	6068632	-0.97	-30.98	31	2	AN	Depth inaccurate due to bow thruster interference
04-Oct-2012	23:15	663	TCC_CAM_97			Freshwater lens camera	72	315956	6068658	315956	6068632	-0.32	-26.29	26	1	AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
04-Oct-2012	23:16	664	TCC_CAM_97			Freshwater lens camera	72	315953	6068654	315956	6068632	2.50	-22.44	23	354	AN	
04-Oct-2012	23:18	665	TCC_CAM_97			Freshwater lens camera	72	315945	6068651	315956	6068632	10.63	-18.83	22	331	AN	
04-Oct-2012	22:20	666	TCC_CAM_97			Freshwater lens camera	72	315938	6068653	315956	6068632	18.02	-21.58	28	320	AN	
04-Oct-2012	23:21	667	TCC_CAM_97			Freshwater lens camera	72	315935	6068656	315956	6068632	21.26	-24.37	32	319	AN	
04-Oct-2012	23:23	668	TCC_CAM_97			Freshwater lens camera	72	315935	6068654	315956	6068632	20.77	-22.58	30	318	AN	
04-Oct-2012	23:48	669	TCC_CAM_98			Freshwater lens camera	69	316333	6068756	316357	6068752	24.16	-3.73	24	279	AN	
04-Oct-2012	23:48	670	TCC_CAM_98			Freshwater lens camera	69	316333	6068764	316357	6068752	23.69	-11.46	26	296	AN	
04-Oct-2012	23:50	671	TCC_CAM_98			Freshwater lens camera	69	316332	6068770	316357	6068752	24.67	-17.48	30	305	AN	
04-Oct-2012	23:51	672	TCC_CAM_98			Freshwater lens camera	69	316342	6068774	316357	6068752	14.71	-21.55	26	326	AN	
04-Oct-2012	23:52	673	TCC_CAM_98			Freshwater lens camera	69	316348	6068773	316357	6068752	9.47	-21.19	23	336	AN	
04-Oct-2012	23:53	674	TCC_CAM_98			Freshwater lens camera	69	316350	6068767	316357	6068752	7.14	-15.31	17	335	AN	
04-Oct-2012	23:54	675	TCC_CAM_98			Freshwater lens camera	69	316350	6068761	316357	6068752	7.03	-8.49	11	320	AN	
04-Oct-2012	23:55	676	TCC_CAM_98			Freshwater lens camera	69	316347	6068758	316357	6068752	9.70	-5.59	11	300	AN	
04-Oct-2012	23:55	677	TCC_CAM_98			Freshwater lens camera	69	316346	6068758	316357	6068752	10.82	-5.85	12	298	AN	
04-Oct-2012	23:56	678	TCC_CAM_98			Freshwater lens camera	69	316347	6068763	316357	6068752	10.18	-10.44	15	316	AN	
04-Oct-2012	23:57	679	TCC_CAM_98			Freshwater lens camera	69	315350	6068767	316357	6068752	1007.11	-15.22	17	335	AN	
04-Oct-2012	23:58	680	TCC_CAM_98			Freshwater lens camera	68	316352	6068768	316357	6068752	5.58	-16.21	17	341	AN	
05-Oct_2012	00:00	681	TCC_CAM_98			Freshwater lens camera	69	316351	6068765	316357	6068752	5.63	-13.07	14	337	AN	
05-Oct_2012	00:00	682	TCC_CAM_98			Freshwater lens camera	69	316351	6068764	316357	6068752	6.38	-12.39	14	333	AN	
05-Oct_2012	00:02	683	TCC_CAM_98			Freshwater lens camera	69	316341	6068760	316357	6068752	15.73	-8.26	18	298	AN	
05-Oct_2012	00:03	684	TCC_CAM_98			Freshwater lens camera	69	316335	6068755	316357	6068752	21.97	-2.80	22	277	AN	
05-Oct_2012	00:04	685	TCC_CAM_98			Freshwater lens camera	69	316329	6068756	316357	6068752	28.18	-4.12	28	278	AN	
05-Oct_2012	00:05	686	TCC_CAM_98			Freshwater lens camera	69	316327	6068765	316357	6068752	30.43	-12.42	33	292	AN	
05-Oct_2012	00:36	687	TCC_CAM_99			Freshwater lens camera	68	317505	6068980	317501	6068953	-4.76	-27.23	28	10	AN	
05-Oct_2012	00:37	688	TCC_CAM_99			Freshwater lens camera	68	317504	6068977	317501	6068953	-3.39	-23.83	24	8	AN	
05-Oct_2012	00:40	689	TCC_CAM_99			Freshwater lens camera	68	317499	6068968	317501	6068953	1.74	-15.75	16	354	AN	
05-Oct_2012	00:41	690	TCC_CAM_99			Freshwater lens camera	68	317502	6068967	317501	6068953	-1.93	-14.68	15	8	AN	
05-Oct_2012	00:42	691	TCC_CAM_99			Freshwater lens camera	68	317507	6068972	317501	6068953	-6.62	-19.27	20	19	AN	
05-Oct_2012	00:43	692	TCC_CAM_99			Freshwater lens camera	68	317509	6068974	317501	6068953	-8.31	-20.88	22	22	AN	
05-Oct_2012	00:46	693	TCC_CAM_99			Freshwater lens camera	68	317513	6068977	317501	6068953	-12.46	-23.86	27	28	AN	
05-Oct_2012	00:48	694	TCC_CAM_99			Freshwater lens camera	68	317514	6068984	317501	6068953	-13.37	-31.45	34	23	AN	
05-Oct_2012	00:49	695	TCC_CAM_99			Freshwater lens camera	68	317513	6068988	317501	6068953	-12.82	-35.67	38	20	AN	
05-Oct_2012	00:50	696	TCC_CAM_99			Freshwater lens camera	68	317509	6068987	317501	6068953	-8.81	-33.86	35	15	AN	
05-Oct_2012	00:51	697	TCC_CAM_99			Freshwater lens camera	68	317499	6068984	317501	6068953	1.66	-31.54	32	357	AN	
05-Oct_2012	00:52	698	TCC_CAM_99			Freshwater lens camera	68	317487	6068977	317501	6068953	13.77	-24.44	28	331	AN	
05-Oct_2012	00:53	699	TCC_CAM_99			Freshwater lens camera	68	317478	6068969	317501	6068953	22.59	-16.77	28	307	AN	
05-Oct_2012	00:54	700	TCC_CAM_99			Freshwater lens camera	68	317476	6068967	317501	6068953	24.60	-14.41	29	300	AN	
05-Oct_2012	23:50	701	TCC_CAM_100			Freshwater lens camera	72	320936	6069472	320931	6069474	-4.97	1.90	5	111	AN	
05-Oct_2012	23:51	702	TCC_CAM_100			Freshwater lens camera	72	320941	6069475	320931	6069474	-10.02	-0.84	10	85	AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
05-Oct_2012	23:52	703	TCC_CAM_100			Freshwater lens camera	72	320939	6069471	320931	6069474	-8.75	3.08	9	109	AN	
05-Oct_2012	23:53	704	TCC_CAM_100			Freshwater lens camera	72	320936	6069464	320931	6069474	-5.64	10.32	12	151	AN	
05-Oct_2012	23:55	705	TCC_CAM_100			Freshwater lens camera	72	320937	6069456	320931	6069474	-5.95	17.81	19	162	AN	
05-Oct_2012	23:56	706	TCC_CAM_100			Freshwater lens camera	72	320931	6069453	320931	6069474	0.04	20.79	21	180	AN	
05-Oct_2012	23:57	707	TCC_CAM_100			Freshwater lens camera	72	320932	6069452	320931	6069474	-1.49	22.30	22	176	AN	
05-Oct_2012	23:59	708	TCC_CAM_100			Freshwater lens camera	72	320945	6069462	320931	6069474	-14.08	12.73	19	132	AN	
06-Oct-2012	00:01	709	TCC_CAM_100			Freshwater lens camera	72	320956	6069466	320931	6069474	-25.48	8.72	27	109	AN	
06-Oct-2012	00:04	710	TCC_CAM_100			Freshwater lens camera	72	320942	6069467	320931	6069474	-11.49	6.78	13	121	AN	
06-Oct-2012	00:06	711	TCC_CAM_100			Freshwater lens camera	72	320941	6069477	320931	6069474	-10.78	-2.44	11	77	AN	
06-Oct-2012	00:08	712	TCC_CAM_100			Freshwater lens camera	72	320941	6069488	320931	6069474	-10.31	-14.14	18	36	AN	
06-Oct-2012	01:25	713	TCC_CAM_101			Freshwater lens camera	75	326727	6071373	326728	6071360	0.66	-12.94	13	357	AN	
06-Oct-2012	01;26	714	TCC_CAM_101			Freshwater lens camera	75	326729	6071373	326728	6071360	-0.79	-13.46	13	3	AN	
06-Oct-2012	01:28	715	TCC_CAM_101			Freshwater lens camera	75	326733	6071372	326728	6071360	-5.54	-12.68	14	24	AN	
06-Oct-2012	01:29	716	TCC_CAM_101			Freshwater lens camera	75	326737	6071374	326728	6071360	-9.42	-14.24	17	33	AN	
06-Oct-2012	01:31	717	TCC_CAM_101			Freshwater lens camera	75	326736	6071368	326728	6071360	-7.97	-7.98	11	45	AN	
06-Oct-2012	01:32	718	TCC_CAM_101			Freshwater lens camera	75	326727	6071358	326728	6071360	0.74	1.42	2	208	AN	
06-Oct-2012	01:36	719	TCC_CAM_101			Freshwater lens camera	75	326739	6071361	326728	6071360	-11.51	-0.93	12	85	AN	
06-Oct-2012	01:37	720	TCC_CAM_101			Freshwater lens camera	75	326741	6071359	326728	6071360	-12.84	1.22	13	95	AN	
06-Oct-2012	01:38	721	TCC_CAM_101			Freshwater lens camera	75	326735	6071352	326728	6071360	-7.18	7.36	10	136	AN	
06-Oct-2012	01:40	722	TCC_CAM_101			Freshwater lens camera	75	326730	6071348	326728	6071360	-2.42	11.88	12	168	AN	
06-Oct-2012	01:41	723	TCC_CAM_101			Freshwater lens camera	75	326735	6071348	326728	6071360	-6.91	12.26	14	151	AN	
06-Oct-2012	01:42	724	TCC_CAM_101			Freshwater lens camera	75	326739	6071347	326728	6071360	-11.01	12.34	17	138	AN	
06-Oct-2012	01:43	725	TCC_CAM_101			Freshwater lens camera	75	326739	6071345	326728	6071360	-10.84	14.36	18	143	AN	
06-Oct-2012	02:10	726	TCC_CAM_102			Freshwater lens camera	77	327742	6071704	327731	6071721	-10.81	17.35	20	148	AN	
06-Oct-2012	02:11	727	TCC_CAM_102			Freshwater lens camera	77	327735	6071698	327731	6071721	-4.45	23.18	24	169	AN	
06-Oct-2012	02:12	728	TCC_CAM_102			Freshwater lens camera	77	327731	6071696	327731	6071721	-0.26	24.70	25	179	AN	
06-Oct-2012	02:13	729	TCC_CAM_102			Freshwater lens camera	77	327731	6071692	327731	6071721	-0.56	28.38	28	179	AN	
06-Oct-2012	02:14	730	TCC_CAM_102			Freshwater lens camera	77	327732	6071691	327731	6071721	-1.71	30.37	30	177	AN	
06-Oct-2012	02:15	731	TCC_CAM_102			Freshwater lens camera	77	327729	6071686	327731	6071721	1.40	35.12	35	182	AN	
06-Oct-2012	02:17	732	TCC_CAM_102			Freshwater lens camera	77	327728	6071682	327731	6071721	2.43	38.53	39	184	AN	
06-Oct-2012	02:18	733	TCC_CAM_102			Freshwater lens camera	77	327734	6071688	327731	6071721	-3.00	32.60	33	175	AN	
06-Oct-2012	02:19	734	TCC_CAM_102			Freshwater lens camera	77	327740	6071693	327731	6071721	-9.28	27.72	29	161	AN	
06-Oct-2012	02:20	735	TCC_CAM_102			Freshwater lens camera	77	327748	6071701	327731	6071721	-17.46	19.61	26	138	AN	
06-Oct-2012	02:21	736	TCC_CAM_102			Freshwater lens camera	77	327752	6071713	327731	6071721	-20.90	8.07	22	111	AN	
06-Oct-2012	02:23	737	TCC_CAM_102			Freshwater lens camera	77	327756	6071722	327731	6071721	-25.31	-1.26	25	87	AN	
06-Oct-2012	02:24	738	TCC_CAM_102			Freshwater lens camera	77	327761	6071736	327731	6071721	-30.12	-15.16	34	63	AN	
06-Oct-2012	04:38	739	TCC_CAM_103			Freshwater lens camera	83	336548	6074993	336537	6074950	-10.85	-42.32	44	14	AN	
06-Oct-2012	04:39	740	TCC_CAM_103			Freshwater lens camera	83	336545	6074991	336537	6074950	-8.67	-40.80	42	12	AN	
06-Oct-2012	04:41	741	TCC_CAM_103			Freshwater lens camera	83	336552	6074984	336537	6074950	-14.90	-33.92	37	24	AN	

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Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
06-Oct-2012	16:48	742	TCC_CAM_103			Freshwater lens camera	83	336535	6074982	336537	6074950	1.51	-31.44	31	357	SKA	
06-Oct-2012	16:49	743	TCC_CAM_103			Freshwater lens camera	83	336528	6074974	336537	6074950	8.22	-23.15	25	340	SKA	
06-Oct-2012	16:51	744	TCC_CAM_103			Freshwater lens camera	83	336526	6074973	336537	6074950	10.67	-22.47	25	335	SKA	
06-Oct-2012	16:52	745	TCC_CAM_103			Freshwater lens camera	83	336533	6074965	336537	6074950	4.15	-14.23	15	344	SKA	
06-Oct-2012	16:54	746	TCC_CAM_103			Freshwater lens camera	83	336564	6074970	336537	6074950	-26.86	-19.11	33	55	SKA	
06-Oct-2012	17:04	747	TCC_CAM_103			Freshwater lens camera	84	336561	6074927	336537	6074950	-24.06	23.27	33	134	SKA	
06-Oct-2012	17:07	748	TCC_CAM_103			Freshwater lens camera	84	336565	6074925	336537	6074950	-28.72	24.95	38	131	SKA	
06-Oct-2012	17:09	749	TCC_CAM_103			Freshwater lens camera	10	336565	6074927	336537	6074950	-28.34	23.49	37	130	SKA	Depth inaccurate due to bow thruster interference
06-Oct-2012	17:10	750	TCC_CAM_103			Freshwater lens camera	84	336559	6074927	336537	6074950	-22.66	22.99	32	135	SKA	
06-Oct-2012	17:11	751	TCC_CAM_103			Freshwater lens camera	8	336550	6074920	336537	6074950	-13.11	30.50	33	157	SKA	Depth inaccurate due to bow thruster interference
06-Oct-2012	17:14	752	TCC_CAM_103			Freshwater lens camera	84	336567	6074935	336537	6074950	-30.79	15.09	34	116	SKA	
06-Oct-2012	18:20	753	TCC_CAM_104			Freshwater lens camera	87	342461	6074447	342474	6074429	12.92	-18.03	22	324	SKA	
06-Oct-2012	18:24	754	TCC_CAM_104			Freshwater lens camera	87	342456	6074395	342474	6074429	18.40	34.03	39	208	SKA	
06-Oct-2012	18:28	755	TCC_CAM_104			Freshwater lens camera	87	342498	6074413	342474	6074429	-23.81	15.38	28	123	SKA	
06-Oct-2012	18:30	756	TCC_CAM_104			Freshwater lens camera	11	342481	6074406	342474	6074429	-6.69	23.26	24	164	SKA	
06-Oct-2012	18:32	757	TCC_CAM_104			Freshwater lens camera	87	342502	6074420	342474	6074429	-27.67	9.16	29	108	SKA	
06-Oct-2012	18:36	758	TCC_CAM_104			Freshwater lens camera	87	342484	6074403	342474	6074429	-9.64	25.72	27	159	SKA	
06-Oct-2012	18:39	759	TCC_CAM_104			Freshwater lens camera	87	342469	6074429	342474	6074429	5.65	-0.03	6	270	SKA	
06-Oct-2012	18:40	760	TCC_CAM_104			Freshwater lens camera	87	342404	6074454	342474	6074429	70.29	-25.39	75	290	SKA	Beacon fix inaccurate due to bow thruster interference
06-Oct-2012	19:10	761	TCC_CAM_105			Freshwater lens camera	84	343468	6074496	343397	6074449	-70.71	-47.01	85	56	SKA	
06-Oct-2012	19:12	762	TCC_CAM_105			Freshwater lens camera	83	343422	6074470	343397	6074449	-25.48	-20.98	33	51	SKA	
06-Oct-2012	19:13	763	TCC_CAM_105			Freshwater lens camera	83	343425	6074467	343397	6074449	-27.56	-17.62	33	57	SKA	
06-Oct-2012	19:15	764	TCC_CAM_105			Freshwater lens camera	84	343419	6074462	343397	6074449	-22.13	-12.72	26	60	SKA	
06-Oct-2012	19:18	765	TCC_CAM_105			Freshwater lens camera	84	343395	6074467	343397	6074449	1.94	-17.73	18	354	SKA	
06-Oct-2012	19:20	766	TCC_CAM_105			Freshwater lens camera	84	343387	6074473	343397	6074449	10.18	-23.74	26	337	SKA	
06-Oct-2012	19:23	767	TCC_CAM_105			Freshwater lens camera	84	343392	6074479	343397	6074449	4.91	-29.76	30	351	SKA	
06-Oct-2012	19:28	768	TCC_CAM_105			Freshwater lens camera	83	343443	6074461	343397	6074449	-45.88	-11.60	47	76	SKA	
06-Oct-2012	19:28	769	TCC_CAM_105			Freshwater lens camera	83	343424	6074434	343397	6074449	-27.27	14.97	31	119	SKA	
06-Oct-2012	19:29	770	TCC_CAM_105			Freshwater lens camera	83	343438	6074439	343397	6074449	-40.73	9.80	42	104	SKA	
06-Oct-2012	20:17	771	TCC_CAM_106			Freshwater lens camera	85	350197	6075801	350157	6075813	-39.97	11.73	42	106	SKA	
06-Oct-2012	20:19	772	TCC_CAM_106			Freshwater lens camera	85	350178	6075794	350157	6075813	-20.87	18.88	28	132	SKA	
06-Oct-2012	20:21	773	TCC_CAM_106			Freshwater lens camera	85	350164	6075802	350157	6075813	-7.25	11.13	13	147	SKA	
06-Oct-2012	20:23	774	TCC_CAM_106			Freshwater lens camera	85	350161	6075805	350157	6075813	-3.79	7.92	9	154	SKA	
06-Oct-2012	20:25	775	TCC_CAM_106			Freshwater lens camera	85	350151	6075811	350157	6075813	6.25	1.84	7	254	SKA	
06-Oct-2012	20:26	776	TCC_CAM_106			Freshwater lens camera	85	350141	6075814	350157	6075813	16.39	-1.37	16	275	SKA	
06-Oct-2012	20:27	777	TCC_CAM_106			Freshwater lens camera	85	350140	6075817	350157	6075813	16.47	-3.91	17	283	SKA	
06-Oct-2012	20:28	778	TCC_CAM_106			Freshwater lens camera	85	350132	6075824	350157	6075813	24.94	-10.69	27	293	SKA	
06-Oct-2012	20:33	779	TCC_CAM_106			Freshwater lens camera	85	350129	6075836	350157	6075813	27.87	-22.68	36	309	SKA	
06-Oct-2012	20:34	780	TCC_CAM_106			Freshwater lens camera	85	350139	6075830	350157	6075813	18.28	-17.16	25	313	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
06-Oct-2012	20:37	781	TCC_CAM_106			Freshwater lens camera	85	350144	6075829	350157	6075813	13.23	-16.18	21	321	SKA	
06-Oct-2012	20:58	782	TCC_CAM_107			Freshwater lens camera	87	351072	6076091	351040	6076074	-32.63	-16.88	37	63	SKA	
06-Oct-2012	21:01	783	TCC_CAM_107			Freshwater lens camera	10	351067	6076091	351040	6076074	-27.12	-17.11	32	58	SKA	Depth inaccurate due to bow thruster interference
06-Oct-2012	21:03	784	TCC_CAM_107			Freshwater lens camera	87	351054	6076101	351040	6076074	-14.67	-27.36	31	28	SKA	
06-Oct-2012	21:04	785	TCC_CAM_107			Freshwater lens camera	87	351056	6076103	351040	6076074	-16.68	-28.95	33	30	SKA	
06-Oct-2012	21:07	786	TCC_CAM_107			Freshwater lens camera	87	351080	6076099	351040	6076074	-40.40	-25.05	48	58	SKA	Beacon fix inaccurate due to bow thruster interference
06-Oct-2012	21:10	787	TCC_CAM_107			Freshwater lens camera	87	351061	6076075	351040	6076074	-21.84	-1.38	22	86	SKA	Beacon fix inaccurate due to bow thruster interference
06-Oct-2012	21:13	788	TCC_CAM_107			Freshwater lens camera	87	351072	6076019	351040	6076074	-32.10	55.20	64	150	SKA	
06-Oct-2012	21:14	789	TCC_CAM_107			Freshwater lens camera	87	351053	6076050	351040	6076074	-13.42	23.31	27	150	SKA	
06-Oct-2012	21:14	790	TCC_CAM_107			Freshwater lens camera	87	351062	6076062	351040	6076074	-22.02	11.79	25	118	SKA	
06-Oct-2012	21:16	791	TCC_CAM_107			Freshwater lens camera	87	351058	6076081	351040	6076074	-18.63	-6.93	20	70	SKA	
06-Oct-2012	23:32	792	TCC_CAM_108			Freshwater lens camera	79	359497	6076908	359464	6076896	-32.80	-11.59	35	71	AN	
08-Oct-2012	11:59	793	TCC_CAM_120			Freshwater lens camera	36	391497	6081382	391459	6081369	-37.88	-12.62	40	72	SKA	
08-Oct-2012	12:01	794	TCC_CAM_120			Freshwater lens camera	36	391490	6081376	391459	6081369	-31.61	-6.70	32	78	SKA	
08-Oct-2012	12:03	795	TCC_CAM_120			Freshwater lens camera	36	391482	6081382	391459	6081369	-23.11	-12.39	26	62	SKA	
08-Oct-2012	12:04	796	TCC_CAM_120			Freshwater lens camera	36	391472	6081395	391459	6081369	-13.43	-25.26	29	28	SKA	
08-Oct-2012	12:05	797	TCC_CAM_120			Freshwater lens camera	36	391475	6081410	391459	6081369	-15.73	-40.34	43	21	SKA	
08-Oct-2012	12:08	798	TCC_CAM_120			Freshwater lens camera	36	391459	6081413	391459	6081369	-0.11	-43.43	43	0	SKA	
08-Oct-2012	12:10	799	TCC_CAM_120			Freshwater lens camera	36	391448	6081407	391459	6081369	10.80	-37.80	39	344	SKA	
08-Oct-2012	12:11	800	TCC_CAM_120			Freshwater lens camera	36	391450	6081401	391459	6081369	8.37	-31.82	33	345	SKA	
08-Oct-2012	12:13	801	TCC_CAM_120			Freshwater lens camera	36	391458	6081395	391459	6081369	0.55	-25.36	25	359	SKA	
08-Oct-2012	12:15	802	TCC_CAM_120			Freshwater lens camera	36	391467	6081390	391459	6081369	-8.64	-20.88	23	22	SKA	
08-Oct-2012	12:50	803	TCC_CAM_119			Freshwater lens camera	39	389867	6081256	389854	6081229	-12.71	-26.75	30	25	SKA	
08-Oct-2012	12:50	804	TCC_CAM_119			Freshwater lens camera	39	389870	6081255	389854	6081229	-15.85	-26.44	31	31	SKA	
08-Oct-2012	12:54	805	TCC_CAM_119			Freshwater lens camera	39	389876	6081245	389854	6081229	-21.68	-16.55	27	53	SKA	
08-Oct-2012	12:55	806	TCC_CAM_119			Freshwater lens camera	39	389871	6081244	389854	6081229	-17.20	-15.41	23	48	SKA	
08-Oct-2012	12:57	807	TCC_CAM_119			Freshwater lens camera	39	389878	6081250	389854	6081229	-24.36	-20.83	32	49	SKA	
08-Oct-2012	12:59	808	TCC_CAM_119			Freshwater lens camera	39	389883	6081248	389854	6081229	-29.06	-19.11	35	57	SKA	
08-Oct-2012	13:01	809	TCC_CAM_119			Freshwater lens camera	39	389883	6081243	389854	6081229	-28.54	-14.38	32	63	SKA	
08-Oct-2012	13:02	810	TCC_CAM_119			Freshwater lens camera	39	389878	6081241	389854	6081229	-24.32	-11.62	27	64	SKA	
08-Oct-2012	13:04	811	TCC_CAM_119			Freshwater lens camera	39	389869	6081239	389854	6081229	-14.56	-10.46	18	54	SKA	
08-Oct-2012	13:07	812	TCC_CAM_119			Freshwater lens camera	39	389872	6081245	389854	6081229	-17.54	-15.77	24	48	SKA	
08-Oct-2012	13:50	813	TCC_CAM_118			Freshwater lens camera	43	388057	6081096	388029	6081068	-28.03	-27.87	40	45	SKA	
08-Oct-2012	13:54	814	TCC_CAM_118			Freshwater lens camera	43	388045	6081094	388029	6081068	-16.07	-25.55	30	32	SKA	
08-Oct-2012	13:57	815	TCC_CAM_118			Freshwater lens camera	43	388018	6081073	388029	6081068	10.99	-4.38	12	292	SKA	
08-Oct-2012	13:58	816	TCC_CAM_118			Freshwater lens camera	43	388018	6081073	388029	6081068	11.12	-4.32	12	291	SKA	
08-Oct-2012	14:00	817	TCC_CAM_118			Freshwater lens camera	43	388006	6081053	388029	6081068	22.76	14.98	27	237	SKA	
08-Oct-2012	14:01	818	TCC_CAM_118			Freshwater lens camera	43	388005	6081048	388029	6081068	23.52	20.04	31	230	SKA	
08-Oct-2012	14:02	819	TCC_CAM_118			Freshwater lens camera	43	388007	6081044	388029	6081068	21.41	24.17	32	222	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
08-Oct-2012	14:35	820	TCC_CAM_117			Freshwater lens camera	44	386781	6080868	386765	6080848	-16.24	-19.92	26	39	SKA	
08-Oct-2012	14:37	821	TCC_CAM_117			Freshwater lens camera	44	386782	6080865	386765	6080848	-16.96	-16.86	24	45	SKA	
08-Oct-2012	14:39	822	TCC_CAM_117			Freshwater lens camera	44	386791	6080866	386765	6080848	-25.99	-18.55	32	54	SKA	
08-Oct-2012	14:40	823	TCC_CAM_117			Freshwater lens camera	44	386791	6080866	386765	6080848	-26.49	-18.63	32	55	SKA	
08-Oct-2012	14:42	824	TCC_CAM_117			Freshwater lens camera	44	386789	6080864	386765	6080848	-24.23	-16.40	29	56	SKA	
08-Oct-2012	14:43	825	TCC_CAM_117			Freshwater lens camera	44	386789	6080861	386765	6080848	-23.56	-13.64	27	60	SKA	
08-Oct-2012	14:45	826	TCC_CAM_117			Freshwater lens camera	44	386791	6080859	386765	6080848	-25.76	-11.04	28	67	SKA	
08-Oct-2012	14:48	827	TCC_CAM_117			Freshwater lens camera	44	386798	6080857	386765	6080848	-32.88	-9.52	34	74	SKA	
08-Oct-2012	14:50	828	TCC_CAM_117			Freshwater lens camera	44	386794	6080856	386765	6080848	-28.80	-8.16	30	74	SKA	
08-Oct-2012	14:51	829	TCC_CAM_117			Freshwater lens camera	44	386791	6080854	386765	6080848	-26.26	-5.94	27	77	SKA	
08-Oct-2012	14:52	830	TCC_CAM_117			Freshwater lens camera	44	386790	6080853	386765	6080848	-24.54	-4.74	25	79	SKA	
08-Oct-2012	15:26	831	TCC_CAM_116			Freshwater lens camera	48	385860	6080666	385862	6080667	1.88	0.90	2	244	SKA	
08-Oct-2012	15:29	832	TCC_CAM_116			Freshwater lens camera	48	385851	6080645	385862	6080667	10.95	22.02	25	206	SKA	
08-Oct-2012	15:31	833	TCC_CAM_116			Freshwater lens camera	48	385857	6080648	385862	6080667	5.62	19.67	20	196	SKA	
08-Oct-2012	15:34	834	TCC_CAM_116			Freshwater lens camera	48	385881	6080654	385862	6080667	-18.51	13.24	23	126	SKA	
08-Oct-2012	15:34	835	TCC_CAM_116			Freshwater lens camera	48	385880	6080653	385862	6080667	-17.33	14.62	23	130	SKA	
08-Oct-2012	15:36	836	TCC_CAM_116			Freshwater lens camera	48	385871	6080642	385862	6080667	-8.79	25.33	27	161	SKA	
08-Oct-2012	15:38	837	TCC_CAM_116			Freshwater lens camera	48	385895	6080649	385862	6080667	-32.31	18.70	37	120	SKA	
08-Oct-2012	15:40	838	TCC_CAM_116			Freshwater lens camera	48	385892	6080642	385862	6080667	-29.71	25.08	39	130	SKA	
08-Oct-2012	16:16	839	TCC_CAM_115			Freshwater lens camera	49	384693	6080487	384679	6080487	-14.30	-0.24	14	89	SKA	
08-Oct-2012	16:16	840	TCC_CAM_115			Freshwater lens camera	49	384688	6080481	384679	6080487	-8.85	5.72	11	123	SKA	
08-Oct-2012	16:19	841	TCC_CAM_115			Freshwater lens camera	49	384668	6080464	384679	6080487	11.06	22.93	25	206	SKA	
08-Oct-2012	16:22	842	TCC_CAM_115			Freshwater lens camera	49	384669	6080460	384679	6080487	9.46	27.23	29	199	SKA	
08-Oct-2012	16:23	843	TCC_CAM_115			Freshwater lens camera	49	384683	6080454	384679	6080487	-4.51	32.79	33	172	SKA	
08-Oct-2012	16:24	844	TCC_CAM_115			Freshwater lens camera	49	384684	6080448	384679	6080487	-5.35	38.41	39	172	SKA	
08-Oct-2012	16:27	845	TCC_CAM_115			Freshwater lens camera	49	384679	6080458	384679	6080487	0.24	28.45	28	180	SKA	
08-Oct-2012	16:28	846	TCC_CAM_115			Freshwater lens camera	49	384663	6080472	384679	6080487	15.96	14.53	22	228	SKA	
08-Oct-2012	16:29	847	TCC_CAM_115			Freshwater lens camera	49	384650	6080480	384679	6080487	28.63	6.98	29	256	SKA	
08-Oct-2012	16:31	848	TCC_CAM_115			Freshwater lens camera	49	384646	6080482	384679	6080487	32.88	4.70	33	262	SKA	
08-Oct-2012	19:54	849	TCC_CAM_114			Freshwater lens camera	53	380860	6081089	380868	6081109	7.25	19.59	21	200	SKA	
08-Oct-2012	19:55	850	TCC_CAM_114			Freshwater lens camera	53	380841	6081099	380868	6081109	26.74	9.93	29	250	SKA	
08-Oct-2012	19:58	851	TCC_CAM_114			Freshwater lens camera	53	380831	6081116	380868	6081109	36.28	-7.32	37	281	SKA	
08-Oct-2012	19:59	852	TCC_CAM_114			Freshwater lens camera	53	380819	6081106	380868	6081109	48.51	2.57	49	267	SKA	
08-Oct-2012	20:05	853	TCC_CAM_114			Freshwater lens camera	53	380885	6081076	380868	6081109	-17.70	32.74	37	152	SKA	
08-Oct-2012	20:06	854	TCC_CAM_114			Freshwater lens camera	53	380867	6081069	380868	6081109	0.61	39.93	40	181	SKA	
08-Oct-2012	20:07	855	TCC_CAM_114			Freshwater lens camera	53	380860	6081071	380868	6081109	7.52	37.14	38	191	SKA	
08-Oct-2012	20:08	856	TCC_CAM_114			Freshwater lens camera	53	380850	6081084	380868	6081109	17.95	24.81	31	216	SKA	
08-Oct-2012	20:11	857	TCC_CAM_114			Freshwater lens camera	53	380854	6081096	380868	6081109	13.57	12.19	18	228	SKA	
08-Oct-2012	20:11	858	TCC_CAM_114			Freshwater lens camera	53	380855	6081098	380868	6081109	12.52	11.02	17	229	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
10-Oct-2012	15:20	859	TCC_CAM_113			Freshwater lens camera	63	373087	6080221	373065	6080186	-22.55	-34.99	42	33	SKA	
10-Oct-2012	15:31	860	TCC_CAM_113			Freshwater lens camera	63	373071	6080231	373065	6080186	-6.46	-45.07	46	8	SKA	
10-Oct-2012	15:33	861	TCC_CAM_113			Freshwater lens camera	63	373084	6080213	373065	6080186	-19.02	-26.95	33	35	SKA	
10-Oct-2012	15:35	862	TCC_CAM_113			Freshwater lens camera	63	373091	6080189	373065	6080186	-26.65	-3.24	27	83	SKA	
10-Oct-2012	15:37	863	TCC_CAM_113			Freshwater lens camera	63	373109	6080202	373065	6080186	-44.13	-15.83	47	70	SKA	
10-Oct-2012	15:42	864	TCC_CAM_113			Freshwater lens camera	8	373040	6080220	373065	6080186	24.19	-34.31	42	325	SKA	Depth inaccurate due to bow thruster interference
10-Oct-2012	15:44	865	TCC_CAM_113			Freshwater lens camera	63	373061	6080205	373065	6080186	3.37	-18.72	19	350	SKA	
10-Oct-2012	15:45	866	TCC_CAM_113			Freshwater lens camera	63	373073	6080175	373065	6080186	-8.02	10.98	14	144	SKA	
10-Oct-2012	15:53	867	TCC_CAM_113			Freshwater lens camera	63	373062	6080223	373065	6080186	2.84	-37.26	37	356	SKA	
10-Oct-2012	15:55	868	TCC_CAM_113			Freshwater lens camera	63	373074	6080199	373065	6080186	-9.26	-13.41	16	35	SKA	
10-Oct-2012	17:09	869	TCC_CAM_112			Freshwater lens camera	61	371871	6080078	371841	6080086	-30.36	7.35	31	104	SKA	
10-Oct-2012	17:18	870	TCC_CAM_112			Freshwater lens camera	60	371852	6080109	371841	6080086	-11.10	-23.36	26	25	SKA	
10-Oct-2012	17:20	871	TCC_CAM_112			Freshwater lens camera	60	371844	6080108	371841	6080086	-3.05	-22.02	22	8	SKA	
10-Oct-2012	17:23	872	TCC_CAM_112			Freshwater lens camera	60	371814	6080104	371841	6080086	26.58	-18.90	33	305	SKA	
10-Oct-2012	17:24	873	TCC_CAM_112			Freshwater lens camera	60	371814	6080098	371841	6080086	27.13	-12.27	30	294	SKA	
10-Oct-2012	17:26	874	TCC_CAM_112			Freshwater lens camera	60	371824	6080090	371841	6080086	17.15	-4.27	18	284	SKA	
10-Oct-2012	17:27	875	TCC_CAM_112			Freshwater lens camera	60	371845	6080088	371841	6080086	-3.72	-2.74	5	54	SKA	
10-Oct-2012	17:27	876	TCC_CAM_112			Freshwater lens camera	60	371845	6080089	371841	6080086	-4.05	-3.22	5	52	SKA	
10-Oct-2012	18:18	877	TCC_CAM_111			Freshwater lens camera	57	370908	6079990	370938	6079985	29.79	-4.28	30	278	SKA	
10-Oct-2012	18:21	878	TCC_CAM_111			Freshwater lens camera	57	370938	6079985	370938	6079985	0.63	0.11	1	260	SKA	
10-Oct-2012	18:22	879	TCC_CAM_111			Freshwater lens camera	57	370950	6079984	370938	6079985	-11.60	1.42	12	97	SKA	
10-Oct-2012	18:25	880	TCC_CAM_111			Freshwater lens camera	57	370934	6079967	370938	6079985	4.02	18.51	19	192	SKA	
10-Oct-2012	18:27	881	TCC_CAM_111			Freshwater lens camera	57	370915	6079967	370938	6079985	23.73	18.29	30	232	SKA	
10-Oct-2012	18:27	882	TCC_CAM_111			Freshwater lens camera	57	370911	6079971	370938	6079985	27.03	14.18	31	242	SKA	
10-Oct-2012	18:30	883	TCC_CAM_111			Freshwater lens camera	57	370898	6079995	370938	6079985	40.32	-9.96	42	284	SKA	
10-Oct-2012	18:32	884	TCC_CAM_111			Freshwater lens camera	57	370930	6080000	370938	6079985	8.36	-14.73	17	330	SKA	
10-Oct-2012	18:33	885	TCC_CAM_111			Freshwater lens camera	57	370956	6079992	370938	6079985	-17.73	-6.31	19	70	SKA	
10-Oct-2012	19:19	886	TCC_CAM_110			Freshwater lens camera	62	369885	6079811	369895	6079785	10.15	-26.04	28	339	SKA	
10-Oct-2012	19:21	887	TCC_CAM_110			Freshwater lens camera	62	369878	6079802	369895	6079785	17.47	-17.23	25	315	SKA	
10-Oct-2012	19:22	888	TCC_CAM_110			Freshwater lens camera	62	369867	6079793	369895	6079785	27.97	-8.57	29	287	SKA	
10-Oct-2012	19:25	889	TCC_CAM_110			Freshwater lens camera	62	369877	6079823	369895	6079785	18.39	-38.00	42	334	SKA	
10-Oct-2012	19:27	890	TCC_CAM_110			Freshwater lens camera	61	369903	6079814	369895	6079785	-7.92	-28.86	30	15	SKA	
10-Oct-2012	19:32	891	TCC_CAM_110			Freshwater lens camera	62	369887	6079813	369895	6079785	8.07	-28.57	30	344	SKA	
10-Oct-2012	19:33	892	TCC_CAM_110			Freshwater lens camera	62	369880	6079789	369895	6079785	15.31	-4.14	16	285	SKA	
10-Oct-2012	19:35	893	TCC_CAM_110			Freshwater lens camera	11	369902	6079790	369895	6079785	-6.78	-5.13	9	53	SKA	Depth inaccurate due to bow thruster interference
10-Oct-2012	19:36	894	TCC_CAM_110			Freshwater lens camera	62	369910	6079778	369895	6079785	-14.61	6.60	16	114	SKA	
10-Oct-2012	19:38	895	TCC_CAM_110			Freshwater lens camera	61	369935	6079787	369895	6079785	-39.38	-2.25	39	87	SKA	
10-Oct-2012	20:37	896	TCC_CAM_108			Freshwater lens camera	79	359460	6076916	359464	6076896	4.14	-19.75	20	348	SKA	
10-Oct-2012	20:37	897	TCC_CAM_108			Freshwater lens camera	79	359462	6076916	359464	6076896	2.49	-20.14	20	353	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant						
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG						
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT	

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
10-Oct-2012	20:39	898	TCC_CAM_108			Freshwater lens camera	79	359481	6076929	359464	6076896	-16.19	-32.48	36	27	SKA	
10-Oct-2012	20:39	899	TCC_CAM_108			Freshwater lens camera	79	359482	6076931	359464	6076896	-18.13	-34.49	39	28	SKA	
10-Oct-2012	20:45	900	TCC_CAM_108			Freshwater lens camera	79	359463	6076898	359464	6076896	1.58	-1.63	2	316	SKA	
10-Oct-2012	20:48	901	TCC_CAM_108			Freshwater lens camera	80	359497	6076898	359464	6076896	-32.93	-1.57	33	87	SKA	
10-Oct-2012	20:50	902	TCC_CAM_108			Freshwater lens camera	80	359463	6076925	359464	6076896	1.46	-28.94	29	357	SKA	
10-Oct-2012	20:53	903	TCC_CAM_108			Freshwater lens camera	80	359480	6076911	359464	6076896	-15.19	-14.46	21	46	SKA	
10-Oct-2012	20:55	904	TCC_CAM_108			Freshwater lens camera	80	359479	6076882	359464	6076896	-14.80	14.59	21	135	SKA	
10-Oct-2012	21:20	905	TCC_CAM_109			Freshwater lens camera	76	360448	6077028	360467	6077017	19.21	-11.60	22	301	SKA	
10-Oct-2012	21:22	906	TCC_CAM_109			Freshwater lens camera	76	360456	6077006	360467	6077017	11.01	10.11	15	227	SKA	
10-Oct-2012	21:24	907	TCC_CAM_109			Freshwater lens camera	76	360473	6077013	360467	6077017	-5.59	3.99	7	126	SKA	
10-Oct-2012	21:26	908	TCC_CAM_109			Freshwater lens camera	76	360495	6077027	360467	6077017	-27.86	-10.43	30	69	SKA	
10-Oct-2012	21:26	909	TCC_CAM_109			Freshwater lens camera	76	360495	6077027	360467	6077017	-27.25	-10.46	29	69	SKA	
10-Oct-2012	21:28	910	TCC_CAM_109			Freshwater lens camera	76	360470	6077052	360467	6077017	-3.03	-35.34	35	5	SKA	
10-Oct-2012	21:29	911	TCC_CAM_109			Freshwater lens camera	76	360463	6077033	360467	6077017	4.54	-16.70	17	345	SKA	
10-Oct-2012	21:29	912	TCC_CAM_109			Freshwater lens camera	76	360464	6077034	360467	6077017	3.68	-17.62	18	348	SKA	
10-Oct-2012	21:32	913	TCC_CAM_109			Freshwater lens camera	76	360459	6077010	360467	6077017	8.46	6.70	11	232	SKA	
10-Oct-2012	21:34	914	TCC_CAM_109			Freshwater lens camera	76	360450	6077041	360467	6077017	17.79	-24.55	30	324	SKA	
13-Oct-2012	18:36	915	TCC_CAM_43			Freshwater lens camera	89	335864	6095404	335875	6095391	10.50	-13.27	17	322	SKA	
13-Oct-2012	18:37	916	TCC_CAM_43			Freshwater lens camera	89	335866	6095412	335875	6095391	8.46	-21.51	23	339	SKA	
13-Oct-2012	18:38	917	TCC_CAM_43			Freshwater lens camera	89	335868	6095407	335875	6095391	7.23	-15.85	17	335	SKA	
13-Oct-2012	18:39	918	TCC_CAM_43			Freshwater lens camera	88	335859	6095391	335875	6095391	15.38	-0.47	15	272	SKA	
13-Oct-2012	18:40	919	TCC_CAM_43			Freshwater lens camera	88	335858	6095392	335875	6095391	16.46	-0.84	16	273	SKA	
13-Oct-2012	18:41	920	TCC_CAM_43			Freshwater lens camera	88	335855	6095389	335875	6095391	19.87	2.06	20	264	SKA	
13-Oct-2012	18:44	921	TCC_CAM_43			Freshwater lens camera	89	335854	6095403	335875	6095391	20.48	-12.18	24	301	SKA	
13-Oct-2012	18:46	922	TCC_CAM_43			Freshwater lens camera	89	335858	6095414	335875	6095391	16.61	-23.38	29	325	SKA	
13-Oct-2012	18:47	923	TCC_CAM_43			Freshwater lens camera	88	335858	6095413	335875	6095391	16.84	-22.43	28	323	SKA	
13-Oct-2012	18:49	924	TCC_CAM_43			Freshwater lens camera	88	335848	6095391	335875	6095391	26.84	-0.46	27	271	SKA	
13-Oct-2012	18:52	925	TCC_CAM_43			Freshwater lens camera	88	335839	6095392	335875	6095391	36.00	-0.95	36	272	SKA	
13-Oct-2012	21:26	926	TCC_CAM_44			Freshwater lens camera	77	339988	6097111	340007	6097096	18.91	-15.61	25	310	SKA	
13-Oct-2012	21:29	927	TCC_CAM_44			Freshwater lens camera	77	339976	6097121	340007	6097096	31.42	-25.05	40	309	SKA	
13-Oct-2012	21:29	928	TCC_CAM_44			Freshwater lens camera	77	339976	6097121	340007	6097096	31.42	-25.05	40	309	SKA	
13-Oct-2012	21:33	929	TCC_CAM_44			Freshwater lens camera	77	339995	6097112	340007	6097096	12.24	-15.91	20	322	SKA	
13-Oct-2012	21:36	930	TCC_CAM_44			Freshwater lens camera	77	340004	6097107	340007	6097096	3.21	-11.65	12	345	SKA	
13-Oct-2012	21:39	931	TCC_CAM_44			Freshwater lens camera	77	339994	6097110	340007	6097096	12.82	-14.51	19	319	SKA	
13-Oct-2012	21:42	932	TCC_CAM_44			Freshwater lens camera	77	339981	6097112	340007	6097096	26.45	-15.90	31	301	SKA	
13-Oct-2012	21:44	933	TCC_CAM_44			Freshwater lens camera	77	339988	6097112	340007	6097096	18.99	-16.32	25	311	SKA	
13-Oct-2012	21:49	934	TCC_CAM_44			Freshwater lens camera	77	339985	6097108	340007	6097096	21.63	-12.31	25	300	SKA	
13-Oct-2012	21:52	935	TCC_CAM_44			Freshwater lens camera	77	340001	6097110	340007	6097096	5.97	-13.74	15	337	SKA	
13-Oct-2012	21:52	936	TCC_CAM_44			Freshwater lens camera	77	340001	6097110	340007	6097096	6.44	-14.06	15	335	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant						
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG						
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT	

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
13-Oct-2012	22:44	937	TCC_CAM_45			Freshwater lens camera	78	343695	6097895	343698	6097858	2.55	-37.41	37	356	SKA	
13-Oct-2012	22:46	938	TCC_CAM_45			Freshwater lens camera	78	343675	6097877	343698	6097858	22.82	-18.74	30	309	SKA	
13-Oct-2012	22:48	939	TCC_CAM_45			Freshwater lens camera	78	343663	6097870	343698	6097858	35.16	-11.72	37	288	SKA	
13-Oct-2012	22:51	940	TCC_CAM_45			Freshwater lens camera	78	343676	6097848	343698	6097858	21.44	9.95	24	245	SKA	
13-Oct-2012	22:54	941	TCC_CAM_45			Freshwater lens camera	78	343682	6097842	343698	6097858	16.25	15.71	23	226	SKA	
13-Oct-2012	22:57	942	TCC_CAM_45			Freshwater lens camera	79	343681	6097836	343698	6097858	16.36	21.90	27	217	SKA	
13-Oct-2012	23:01	943	TCC_CAM_45			Freshwater lens camera	79	343679	6097838	343698	6097858	19.23	20.47	28	223	SKA	
13-Oct-2012	23:02	944	TCC_CAM_45			Freshwater lens camera	79	343680	6097844	343698	6097858	17.59	14.32	23	231	SKA	
14-Oct-2012	00:14	945	TCC_CAM_46			Freshwater lens camera	83	345261	6098195	345283	6098219	21.06	23.74	32	222	AN	
14-Oct-2012	00:15	946	TCC_CAM_46			Freshwater lens camera	83	345261	6098186	345283	6098219	21.18	33.40	39	213	AN	
14-Oct-2012	00:17	947	TCC_CAM_46			Freshwater lens camera	82	345267	6098199	345283	6098219	15.12	19.96	25	217	AN	
14-Oct-2012	00:19	948	TCC_CAM_46			Freshwater lens camera	82	345289	6098248	345283	6098219	-6.32	-29.01	30	12	AN	
14-Oct-2012	00:20	949	TCC_CAM_46			Freshwater lens camera	82	345280	6098203	345283	6098219	2.35	16.57	17	188	AN	
14-Oct-2012	00:23	950	TCC_CAM_46			Freshwater lens camera	82	345293	6098205	345283	6098219	-10.32	13.70	17	143	AN	
14-Oct-2012	00:24	951	TCC_CAM_46			Freshwater lens camera	82	345293	6098214	345283	6098219	-10.90	4.88	12	114	AN	
14-Oct-2012	00:26	952	TCC_CAM_46			Freshwater lens camera	82	345288	6098208	345283	6098219	-5.94	11.49	13	153	AN	
14-Oct-2012	00:26	953	TCC_CAM_46			Freshwater lens camera	82	345288	6098208	345283	6098219	-5.65	11.54	13	154	AN	
14-Oct-2012	02:10	954	TCC_CAM_47			Freshwater lens camera	81	348085	6097664	348071	6097698	-14.14	33.12	36	157	AN	
14-Oct-2012	02:11	955	TCC_CAM_47			Freshwater lens camera	81	348075	6097661	348071	6097698	-3.99	36.66	37	174	AN	
14-Oct-2012	02:13	956	TCC_CAM_47			Freshwater lens camera	8	348070	6097687	348071	6097698	0.74	10.38	10	184	AN	Depth inaccurate due to bow thruster interference
14-Oct-2012	02:15	957	TCC_CAM_47			Freshwater lens camera	81	348090	6097665	348071	6097698	-19.55	32.23	38	149	AN	
14-Oct-2012	02:17	958	TCC_CAM_47			Freshwater lens camera	81	348100	6097674	348071	6097698	-28.76	23.72	37	130	AN	
14-Oct-2012	02:18	959	TCC_CAM_47			Freshwater lens camera	81	348103	6097681	348071	6097698	-32.09	16.88	36	118	AN	
14-Oct-2012	02:19	960	TCC_CAM_47			Freshwater lens camera	81	348103	6097677	348071	6097698	-31.87	20.73	38	123	AN	
14-Oct-2012	02:21	961	TCC_CAM_47			Freshwater lens camera	81	348087	6097665	348071	6097698	-15.99	32.46	36	154	AN	
14-Oct-2012	02:24	962	TCC_CAM_47			Freshwater lens camera	81	348084	6097683	348071	6097698	-13.72	14.16	20	136	AN	
14-Oct-2012	02:27	963	TCC_CAM_47			Freshwater lens camera	81	348101	6097693	348071	6097698	-30.27	4.60	31	99	AN	
14-Oct-2012	02:28	964	TCC_CAM_47			Freshwater lens camera	81	348103	6097686	348071	6097698	-32.18	12.00	34	110	AN	
15-Oct-2012	09:09	965	TCC_CAM_48			Freshwater lens camera	78	353905	6098864	353888	6098841	-17.54	-22.80	29	38	AN	
15-Oct-2012	09:09	966	TCC_CAM_48			Freshwater lens camera	78	353898	6098858	353888	6098841	-9.93	-17.37	20	30	AN	
15-Oct-2012	09:10	967	TCC_CAM_48			Freshwater lens camera	78	353893	6098858	353888	6098841	-5.49	-16.71	18	18	AN	
15-Oct-2012	09:10	968	TCC_CAM_48			Freshwater lens camera	78	353891	6098857	353888	6098841	-3.37	-16.38	17	12	AN	
15-Oct-2012	09:11	969	TCC_CAM_48			Freshwater lens camera	78	353891	6098859	353888	6098841	-2.88	-18.30	19	9	AN	
15-Oct-2012	09:12	970	TCC_CAM_48			Freshwater lens camera	78	353893	6098867	353888	6098841	-5.03	-25.57	26	11	AN	
15-Oct-2012	09:13	971	TCC_CAM_48			Freshwater lens camera	8	353895	6098863	353888	6098841	-7.48	-22.49	24	18	AN	Depth inaccurate due to bow thruster interference
15-Oct-2012	09:14	972	TCC_CAM_48			Freshwater lens camera	78	353901	6098857	353888	6098841	-12.81	-15.78	20	39	AN	
15-Oct-2012	09:14	973	TCC_CAM_48			Freshwater lens camera	78	353896	6098860	353888	6098841	-7.63	-19.53	22	26	AN	
15-Oct-2012	09:14	974	TCC_CAM_48			Freshwater lens camera	78	353900	6098862	353888	6098841	-12.55	-21.43	25	30	AN	
15-Oct-2012	09:16	975	TCC_CAM_48			Freshwater lens camera	78	353900	6098857	353888	6098841	-12.03	-16.21	20	37	AN	

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Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
15-Oct-2012	09:16	976	TCC_CAM_48			Freshwater lens camera	78	353898	6098856	353888	6098841	-9.68	-15.40	18	32	AN	
15-Oct-2012	09:17	977	TCC_CAM_48			Freshwater lens camera	78	353893	6098858	353888	6098841	-5.50	-16.74	18	18	AN	
15-Oct-2012	09:18	978	TCC_CAM_48			Freshwater lens camera	78	353883	6098859	353888	6098841	4.45	-18.00	19	346	AN	
15-Oct-2012	09:19	979	TCC_CAM_48			Freshwater lens camera	9	353887	6098858	353888	6098841	0.44	-17.25	17	359	AN	Depth inaccurate due to bow thruster interference
15-Oct-2012	09:20	980	TCC_CAM_48			Freshwater lens camera	78	353884	6098862	353888	6098841	3.72	-20.60	21	350	AN	
15-Oct-2012	09:20	981	TCC_CAM_48			Freshwater lens camera	78	353884	6098862	353888	6098841	3.83	-20.67	21	350	AN	
15-Oct-2012	09:21	982	TCC_CAM_48			Freshwater lens camera	78	353901	6098862	353888	6098841	-13.29	-21.20	25	32	AN	
15-Oct-2012	09:23	983	TCC_CAM_48			Freshwater lens camera	78	353888	6098861	353888	6098841	-0.48	-20.01	20	1	AN	
15-Oct-2012	09:23	984	TCC_CAM_48			Freshwater lens camera	78	353888	6098861	353888	6098841	0.03	-20.39	20	360	AN	
15-Oct-2012	09:23	985	TCC_CAM_48			Freshwater lens camera	78	353888	6098862	353888	6098841	0.01	-21.04	21	360	AN	
15-Oct-2012	09:25	986	TCC_CAM_48			Freshwater lens camera	78	353888	6098872	353888	6098841	-0.36	-31.26	31	1	AN	
15-Oct-2012	09:26	987	TCC_CAM_48			Freshwater lens camera	78	353892	6098869	353888	6098841	-4.05	-27.70	28	8	AN	
15-Oct-2012	09:27	988	TCC_CAM_48			Freshwater lens camera	78	353895	6098867	353888	6098841	-6.66	-25.99	27	15	AN	
15-Oct-2012	09:27	989	TCC_CAM_48			Freshwater lens camera	78	353897	6098865	353888	6098841	-8.60	-24.14	26	20	AN	
15-Oct-2012	09:28	990	TCC_CAM_48			Freshwater lens camera	78	353896	6098865	353888	6098841	-8.12	-23.97	24	19	AN	
15-Oct-2012	09:29	991	TCC_CAM_48			Freshwater lens camera	78	353896	6098860	353888	6098841	-8.13	-18.96	21	23	AN	
15-Oct-2012	09:30	992	TCC_CAM_48			Freshwater lens camera	78	353894	6098855	353888	6098841	-5.69	-13.61	15	23	AN	
15-Oct-2012	09:31	993	TCC_CAM_48			Freshwater lens camera	78	353892	6098854	353888	6098841	-3.59	-13.34	14	15	AN	
15-Oct-2012	12:31	994	TCC_CAM_50			Freshwater lens camera	77	359479	6099359	359464	6099383	-14.97	23.14	28	147	SKA	
15-Oct-2012	12:34	995	TCC_CAM_50			Freshwater lens camera	77	359471	6099360	359464	6099383	-6.99	22.59	24	163	SKA	
15-Oct-2012	12:36	996	TCC_CAM_50			Freshwater lens camera	77	359474	6099355	359464	6099383	-9.85	27.56	29	160	SKA	
15-Oct-2012	12:40	997	TCC_CAM_50			Freshwater lens camera	77	359467	6099358	359464	6099383	-2.75	24.97	25	174	SKA	
15-Oct-2012	12:43	998	TCC_CAM_50			Freshwater lens camera	77	359459	6099371	359464	6099383	4.90	11.18	12	204	SKA	
15-Oct-2012	12:45	999	TCC_CAM_50			Freshwater lens camera	77	359454	6099382	359464	6099383	10.42	0.58	10	267	SKA	
15-Oct-2012	12:47	1000	TCC_CAM_50			Freshwater lens camera	77	359458	6099380	359464	6099383	6.67	2.30	7	251	SKA	
15-Oct-2012	12:49	1001	TCC_CAM_50			Freshwater lens camera	77	359452	6099378	359464	6099383	12.44	4.87	13	249	SKA	
15-Oct-2012	13:31	1002	TCC_CAM_49			Freshwater lens camera	79	358830	6099302	358822	6099322	-7.23	20.11	21	160	SKA	
15-Oct-2012	13:35	1003	TCC_CAM_49			Freshwater lens camera	79	358824	6099300	358822	6099322	-1.91	22.40	22	175	SKA	
15-Oct-2012	13:38	1004	TCC_CAM_49			Freshwater lens camera	79	358817	6099314	358822	6099322	5.95	8.52	10	215	SKA	
15-Oct-2012	13:39	1005	TCC_CAM_49			Freshwater lens camera	79	358825	6099305	358822	6099322	-2.86	16.91	17	170	SKA	
15-Oct-2012	13:42	1006	TCC_CAM_49			Freshwater lens camera	80	358823	6099305	358822	6099322	-0.33	17.49	17	179	SKA	
15-Oct-2012	13:45	1007	TCC_CAM_49			Freshwater lens camera	80	358820	6099329	358822	6099322	2.12	-6.57	7	342	SKA	
15-Oct-2012	13:47	1008	TCC_CAM_49			Freshwater lens camera	80	358821	6099337	358822	6099322	1.25	-14.91	15	355	SKA	
15-Oct-2012	13:48	1009	TCC_CAM_49			Freshwater lens camera	80	358830	6099330	358822	6099322	-7.32	-7.20	10	45	SKA	
15-Oct-2012	15:09	1010	TCC_CAM_51			Shallow water camera	69	364746	6100763	364740	6100767	-5.96	3.71	7	122	SKA	
15-Oct-2012	15:10	1011	TCC_CAM_51			Shallow water camera	69	364744	6100763	364740	6100767	-3.64	3.26	5	132	SKA	
15-Oct-2012	15:11	1012	TCC_CAM_51			Shallow water camera	69	364739	6100758	364740	6100767	1.33	8.38	8	189	SKA	
15-Oct-2012	15:12	1013	TCC_CAM_51			Shallow water camera	69	364735	6100753	364740	6100767	5.43	13.25	14	202	SKA	
15-Oct-2012	15:13	1014	TCC_CAM_51			Shallow water camera	69	364735	6100747	364740	6100767	5.23	19.44	20	195	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
15-Oct-2012	15:13	1015	TCC_CAM_51			Shallow water camera	69	364736	6100745	364740	6100767	4.18	21.39	22	191	SKA	
15-Oct-2012	15:15	1016	TCC_CAM_51			Shallow water camera	69	364732	6100734	364740	6100767	7.81	32.42	33	194	SKA	
15-Oct-2012	15:16	1017	TCC_CAM_51			Shallow water camera	69	364721	6100731	364740	6100767	19.06	35.81	41	208	SKA	
15-Oct-2012	15:17	1018	TCC_CAM_51			Shallow water camera	69	364722	6100733	364740	6100767	18.03	33.25	38	208	SKA	
15-Oct-2012	15:18	1019	TCC_CAM_51			Shallow water camera	69	364730	6100742	364740	6100767	9.53	24.46	26	201	SKA	
15-Oct-2012	15:19	1020	TCC_CAM_51			Shallow water camera	69	364731	6100746	364740	6100767	9.04	21.07	23	203	SKA	
15-Oct-2012	15:20	1021	TCC_CAM_51			Shallow water camera	69	364730	6100756	364740	6100767	9.87	10.32	14	224	SKA	
15-Oct-2012	15:21	1022	TCC_CAM_51			Shallow water camera	69	364731	6100761	364740	6100767	8.85	5.90	11	236	SKA	
15-Oct-2012	15:21	1023	TCC_CAM_51			Shallow water camera	69	364734	6100764	364740	6100767	5.56	2.53	6	246	SKA	
15-Oct-2012	15:22	1024	TCC_CAM_51			Shallow water camera	69	364737	6100765	364740	6100767	3.03	1.35	3	246	SKA	
15-Oct-2012	15:23	1025	TCC_CAM_51			Shallow water camera	69	364756	6100767	364740	6100767	-15.75	-0.06	16	90	SKA	
15-Oct-2012	15:23	1026	TCC_CAM_51			Shallow water camera	69	364769	6100766	364740	6100767	-28.71	0.81	29	92	SKA	
15-Oct-2012	15:26	1027	TCC_CAM_51			Shallow water camera	69	364762	6100737	364740	6100767	-22.30	29.22	37	143	SKA	
15-Oct-2012	15:27	1028	TCC_CAM_51			Shallow water camera	69	364750	6100723	364740	6100767	-9.96	44.08	45	167	SKA	
15-Oct-2012	15:28	1029	TCC_CAM_51			Shallow water camera	69	364743	6100724	364740	6100767	-3.05	42.19	42	176	SKA	
15-Oct-2012	16:09	1030	TCC_CAM_52			Shallow water camera	71	366399	6100849	366405	6100887	6.12	37.61	38	189	SKA	
15-Oct-2012	16:10	1031	TCC_CAM_52			Shallow water camera	8	366395	6100847	366405	6100887	10.35	39.73	41	195	SKA	Depth inaccurate due to bow thruster interference
15-Oct-2012	16:11	1032	TCC_CAM_52			Shallow water camera	67	366409	6100856	366405	6100887	-4.33	30.79	31	172	SKA	
15-Oct-2012	16:12	1033	TCC_CAM_52			Shallow water camera	71	366414	6100860	366405	6100887	-9.38	27.28	29	161	SKA	
15-Oct-2012	16:12	1034	TCC_CAM_52			Shallow water camera	71	366427	6100858	366405	6100887	-22.61	28.64	36	142	SKA	
15-Oct-2012	16:14	1035	TCC_CAM_52			Shallow water camera	71	366446	6100866	366405	6100887	-41.30	20.69	46	117	SKA	
15-Oct-2012	16:15	1036	TCC_CAM_52			Shallow water camera	71	366452	6100883	366405	6100887	-47.53	3.66	48	94	SKA	
15-Oct-2012	16:16	1037	TCC_CAM_52			Shallow water camera	71	366454	6100880	366405	6100887	-49.53	7.19	50	98	SKA	
15-Oct-2012	16:17	1038	TCC_CAM_52			Shallow water camera	71	366442	6100878	366405	6100887	-36.72	9.04	38	104	SKA	
15-Oct-2012	16:18	1039	TCC_CAM_52			Shallow water camera	8	366432	6100872	366405	6100887	-27.06	14.67	31	118	SKA	Depth inaccurate due to bow thruster interference
15-Oct-2012	16:20	1040	TCC_CAM_52			Shallow water camera	71	366410	6100865	366405	6100887	-5.07	21.70	22	167	SKA	
15-Oct-2012	16:20	1041	TCC_CAM_52			Shallow water camera	71	366404	6100862	366405	6100887	0.90	24.69	25	182	SKA	
15-Oct-2012	16:21	1042	TCC_CAM_52			Shallow water camera	71	366355	6100837	366405	6100887	49.50	50.45	71	224	SKA	Beacon fix inaccurate due to bow thruster interference
15-Oct-2012	16:23	1043	TCC_CAM_52			Shallow water camera	70	366379	6100853	366405	6100887	26.32	34.11	43	218	SKA	
15-Oct-2012	16:25	1044	TCC_CAM_52			Shallow water camera	70	366378	6100859	366405	6100887	26.97	28.07	39	224	SKA	Beacon fix inaccurate due to bow thruster interference
15-Oct-2012	18:01	1045	TCC_CAM_53			Shallow water camera	67	371418	6100423	371373	6100444	-45.60	21.42	50	115	SKA	
15-Oct-2012	18:01	1046	TCC_CAM_53			Shallow water camera	67	371412	6100415	371373	6100444	-39.58	29.16	49	126	SKA	
15-Oct-2012	18:02	1047	TCC_CAM_53			Shallow water camera	67	371409	6100412	371373	6100444	-36.25	32.05	48	131	SKA	
15-Oct-2012	18:03	1048	TCC_CAM_53			Shallow water camera	67	371404	6100417	371373	6100444	-31.74	26.87	42	130	SKA	
15-Oct-2012	18:03	1049	TCC_CAM_53			Shallow water camera	67	371403	6100421	371373	6100444	-30.16	23.22	38	128	SKA	
15-Oct-2012	18:04	1050	TCC_CAM_53			Shallow water camera	67	371401	6100431	371373	6100444	-28.67	13.29	32	115	SKA	
15-Oct-2012	18:04	1051	TCC_CAM_53			Shallow water camera	67	371402	6100434	371373	6100444	-29.10	10.18	31	109	SKA	
15-Oct-2012	18:05	1052	TCC_CAM_53			Shallow water camera	67	371403	6100438	371373	6100444	-30.09	6.58	31	102	SKA	
15-Oct-2012	18:05	1053	TCC_CAM_53			Shallow water camera	67	371407	6100449	371373	6100444	-33.94	-4.89	34	82	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
15-Oct-2012	18:06	1054	TCC_CAM_53			Shallow water camera	67	371405	6100456	371373	6100444	-32.60	-12.22	35	69	SKA	
15-Oct-2012	18:08	1055	TCC_CAM_53			Shallow water camera	67	371405	6100475	371373	6100444	-32.43	-30.77	45	47	SKA	
15-Oct-2012	18:08	1056	TCC_CAM_53			Shallow water camera	67	371408	6100475	371373	6100444	-35.42	-30.51	47	49	SKA	
15-Oct-2012	18:08	1057	TCC_CAM_53			Shallow water camera	67	371413	6100474	371373	6100444	-40.21	-30.19	50	53	SKA	
15-Oct-2012	18:10	1058	TCC_CAM_53			Shallow water camera	67	371416	6100453	371373	6100444	-42.94	-8.56	44	79	SKA	
15-Oct-2012	18:11	1059	TCC_CAM_53			Shallow water camera	67	371415	6100446	371373	6100444	-42.68	-1.84	43	88	SKA	
15-Oct-2012	18:11	1060	TCC_CAM_53			Shallow water camera	67	371411	6100441	371373	6100444	-38.46	2.71	39	94	SKA	
15-Oct-2012	18:12	1061	TCC_CAM_53			Shallow water camera	67	371404	6100429	371373	6100444	-31.69	15.60	35	116	SKA	
15-Oct-2012	18:14	1062	TCC_CAM_53			Shallow water camera	67	371387	6100429	371373	6100444	-14.54	14.90	21	136	SKA	
15-Oct-2012	18:14	1063	TCC_CAM_53			Shallow water camera	67	371386	6100432	371373	6100444	-13.36	12.44	18	133	SKA	
15-Oct-2012	18:15	1064	TCC_CAM_53			Shallow water camera	67	371388	6100435	371373	6100444	-14.88	9.04	17	121	SKA	
15-Oct-2012	18:15	1065	TCC_CAM_53			Shallow water camera	67	371387	6100442	371373	6100444	-14.82	2.23	15	99	SKA	
15-Oct-2012	18:16	1066	TCC_CAM_53			Shallow water camera	67	371387	6100447	371373	6100444	-14.69	-2.94	15	79	SKA	
15-Oct-2012	18:17	1067	TCC_CAM_53			Shallow water camera	67	371385	6100461	371373	6100444	-12.14	-17.07	21	35	SKA	
15-Oct-2012	18:18	1068	TCC_CAM_53			Shallow water camera	67	371394	6100468	371373	6100444	-21.63	-23.73	32	42	SKA	
15-Oct-2012	18:18	1069	TCC_CAM_53			Shallow water camera	67	371403	6100467	371373	6100444	-30.41	-22.82	38	53	SKA	
15-Oct-2012	19:56	1070	TCC_CAM_54			Shallow water camera	67	378323	6102101	378320	6102070	-2.70	-30.35	30	5	SKA	
15-Oct-2012	19:57	1071	TCC_CAM_54			Shallow water camera	67	378320	6102090	378320	6102070	0.52	-19.65	20	358	SKA	
15-Oct-2012	19:58	1072	TCC_CAM_54			Shallow water camera	67	378338	6102099	378320	6102070	-17.81	-28.70	34	32	SKA	
15-Oct-2012	20:00	1073	TCC_CAM_54			Shallow water camera	67	378348	6102085	378320	6102070	-28.14	-14.33	32	63	SKA	
15-Oct-2012	20:01	1074	TCC_CAM_54			Shallow water camera	8	378344	6102082	378320	6102070	-23.57	-11.52	26	64	SKA	Depth inaccurate due to bow thruster interference
15-Oct-2012	20:05	1075	TCC_CAM_54			Shallow water camera	67	378332	6102107	378320	6102070	-12.12	-36.11	38	19	SKA	
15-Oct-2012	20:11	1076	TCC_CAM_54			Shallow water camera	67	378324	6102090	378320	6102070	-3.79	-19.61	20	11	SKA	
15-Oct-2012	20:12	1077	TCC_CAM_54			Shallow water camera	65	378334	6102109	378320	6102070	-13.79	-38.59	41	20	SKA	Camera drop point position used, due to poor beacon data
15-Oct-2012	20:13	1078	TCC_CAM_54			Shallow water camera	67	378335	6102097	378320	6102070	-15.23	-26.55	31	30	SKA	
15-Oct-2012	20:16	1079	TCC_CAM_54			Shallow water camera	67	378335	6102068	378320	6102070	-15.04	2.45	15	99	SKA	
15-Oct-2012	21:22	1080	TCC_CAM_55			Shallow water camera	61	386357	6102975	386344	6102953	-12.81	-21.90	25	30	SKA	
15-Oct-2012	21:23	1081	TCC_CAM_55			Shallow water camera	61	386343	6102976	386344	6102953	1.15	-23.13	23	357	SKA	
15-Oct-2012	21:25	1082	TCC_CAM_55			Shallow water camera	9	386351	6102983	386344	6102953	-7.20	-29.86	31	14	SKA	
15-Oct-2012	21:26	1083	TCC_CAM_55			Shallow water camera	61	386364	6102981	386344	6102953	-19.87	-27.78	34	36	SKA	
15-Oct-2012	21:27	1084	TCC_CAM_55			Shallow water camera	8	386367	6102983	386344	6102953	-23.39	-29.45	38	38	SKA	Depth inaccurate due to bow thruster interference
15-Oct-2012	21:28	1085	TCC_CAM_55			Shallow water camera	61	386363	6102970	386344	6102953	-19.64	-16.51	26	50	SKA	
15-Oct-2012	21:28	1086	TCC_CAM_55			Shallow water camera	61	386363	6102969	386344	6102953	-18.85	-15.54	24	51	SKA	
15-Oct-2012	21:30	1087	TCC_CAM_55			Shallow water camera	61	386347	6102951	386344	6102953	-3.76	2.17	4	120	SKA	
15-Oct-2012	21:30	1088	TCC_CAM_55			Shallow water camera	61	386342	6102950	386344	6102953	1.69	3.09	4	209	SKA	
15-Oct-2012	21:31	1089	TCC_CAM_55			Shallow water camera	61	386332	6102947	386344	6102953	12.02	5.77	13	244	SKA	
15-Oct-2012	21:32	1090	TCC_CAM_55			Shallow water camera	61	386330	6102956	386344	6102953	13.67	-2.63	14	281	SKA	
15-Oct-2012	21:33	1091	TCC_CAM_55			Shallow water camera	61	386327	6102951	386344	6102953	17.22	1.71	17	264	SKA	
15-Oct-2012	21:34	1092	TCC_CAM_55			Shallow water camera	61	386330	6102956	386344	6102953	13.56	-2.62	14	281	SKA	

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Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
15-Oct-2012	21:35	1093	TCC_CAM_55			Shallow water camera	61	386333	6102955	386344	6102953	10.59	-2.40	11	283	SKA	
15-Oct-2012	21:36	1094	TCC_CAM_55			Shallow water camera	61	386348	6102958	386344	6102953	-4.63	-4.73	7	44	SKA	
15-Oct-2012	21:37	1095	TCC_CAM_55			Shallow water camera	61	386353	6102959	386344	6102953	-9.22	-5.80	11	58	SKA	
15-Oct-2012	22:28	1096	TCC_CAM_56			Shallow water camera	47	390780	6103423	390777	6103414	-3.59	-8.92	10	22	SKA	
15-Oct-2012	22:29	1097	TCC_CAM_56			Shallow water camera	47	390782	6103425	390777	6103414	-5.49	-10.69	12	27	SKA	
15-Oct-2012	22:29	1098	TCC_CAM_56			Shallow water camera	47	390783	6103425	390777	6103414	-6.35	-10.24	12	32	SKA	
15-Oct-2012	22:30	1099	TCC_CAM_56			Shallow water camera	47	390785	6103424	390777	6103414	-7.79	-9.56	12	39	SKA	
15-Oct-2012	22:31	1100	TCC_CAM_56			Shallow water camera	47	390786	6103430	390777	6103414	-9.02	-15.51	18	30	SKA	
15-Oct-2012	22:32	1101	TCC_CAM_56			Shallow water camera	47	390785	6103443	390777	6103414	-7.92	-28.28	29	16	SKA	
15-Oct-2012	22:33	1102	TCC_CAM_56			Shallow water camera	47	390784	6103442	390777	6103414	-6.83	-27.11	28	14	SKA	
15-Oct-2012	22:33	1103	TCC_CAM_56			Shallow water camera	47	390779	6103432	390777	6103414	-2.47	-17.44	18	8	SKA	
15-Oct-2012	22:35	1104	TCC_CAM_56			Shallow water camera	47	390769	6103413	390777	6103414	7.39	1.16	7	261	SKA	
15-Oct-2012	22:36	1105	TCC_CAM_56			Shallow water camera	47	390763	6103399	390777	6103414	13.88	15.01	20	223	SKA	
15-Oct-2012	22:37	1106	TCC_CAM_56			Shallow water camera	47	390761	6103397	390777	6103414	16.03	17.77	24	222	SKA	
15-Oct-2012	22:37	1107	TCC_CAM_56			Shallow water camera	47	390756	6103393	390777	6103414	21.09	21.55	30	224	SKA	
15-Oct-2012	22:38	1108	TCC_CAM_56			Shallow water camera	48	390752	6103395	390777	6103414	24.98	19.46	32	232	SKA	
15-Oct-2012	22:39	1109	TCC_CAM_56			Shallow water camera	48	390749	6103399	390777	6103414	27.80	15.34	32	241	SKA	
15-Oct-2012	22:40	1110	TCC_CAM_56			Shallow water camera	47	390750	6103409	390777	6103414	26.42	5.43	27	258	SKA	
15-Oct-2012	22:42	1111	TCC_CAM_56			Shallow water camera	47	390764	6103442	390777	6103414	12.55	-27.77	30	336	SKA	
15-Oct-2012	23:32	1112	TCC_CAM_57			Shallow water camera	33	394161	6102793	394187	6102773	25.65	-20.56	33	309	AN	
15-Oct-2012	23:32	1113	TCC_CAM_57			Shallow water camera	33	394166	6102791	394187	6102773	20.48	-18.84	28	313	AN	
15-Oct-2012	23:33	1114	TCC_CAM_57			Shallow water camera	33	394174	6102787	394187	6102773	12.79	-14.15	19	318	AN	
15-Oct-2012	23:34	1115	TCC_CAM_57			Shallow water camera	33	394179	6102783	394187	6102773	8.32	-10.26	13	321	AN	
15-Oct-2012	23:36	1116	TCC_CAM_57			Shallow water camera	33	394183	6102782	394187	6102773	4.26	-9.53	10	336	AN	
15-Oct-2012	23:38	1117	TCC_CAM_57			Shallow water camera	33	394173	6102774	394187	6102773	13.55	-1.09	14	275	AN	
15-Oct-2012	23:39	1118	TCC_CAM_57			Shallow water camera	34	394162	6102773	394187	6102773	25.22	-0.79	25	272	AN	
15-Oct-2012	23:41	1119	TCC_CAM_57			Shallow water camera	33	394170	6102766	394187	6102773	16.59	6.32	18	249	AN	
15-Oct-2012	23:42	1120	TCC_CAM_57			Shallow water camera	33	394174	6102768	394187	6102773	12.86	4.53	14	251	AN	
15-Oct-2012	23:43	1121	TCC_CAM_57			Shallow water camera	33	394178	6102771	394187	6102773	9.05	1.58	9	260	AN	
15-Oct-2012	23:43	1122	TCC_CAM_57			Shallow water camera	33	394185	6102773	394187	6102773	1.60	-0.66	2	292	AN	
15-Oct-2012	23:45	1123	TCC_CAM_57			Shallow water camera	33	394192	6102773	394187	6102773	-4.80	-0.43	5	85	AN	
16-Oct-2012	00:36	1124	TCC_CAM_58			Shallow water camera	33	395019	6102917	395029	6102913	10.31	-3.96	11	291	AN	
16-Oct-2012	00:36	1125	TCC_CAM_58			Shallow water camera	33	395020	6102917	395029	6102913	9.36	-4.30	10	295	AN	
16-Oct-2012	00:37	1126	TCC_CAM_58			Shallow water camera	33	395021	6102915	395029	6102913	8.36	-2.32	9	286	AN	
16-Oct-2012	00:39	1127	TCC_CAM_58			Shallow water camera	33	395028	6102906	395029	6102913	1.18	6.85	7	190	AN	
16-Oct-2012	00:40	1128	TCC_CAM_58			Shallow water camera	33	395032	6102903	395029	6102913	-2.59	10.28	11	166	AN	
16-Oct-2012	00:41	1129	TCC_CAM_58			Shallow water camera	33	395029	6102902	395029	6102913	0.34	11.02	11	182	AN	
16-Oct-2012	00:42	1130	TCC_CAM_58			Shallow water camera	33	395030	6102901	395029	6102913	-0.65	11.63	12	177	AN	
16-Oct-2012	00:43	1131	TCC_CAM_58			Shallow water camera	33	395032	6102902	395029	6102913	-3.10	11.07	12	164	AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
16-Oct-2012	00:43	1132	TCC_CAM_58			Shallow water camera	33	395032	6102902	395029	6102913	-2.62	10.64	11	166	AN	
16-Oct-2012	00:45	1133	TCC_CAM_58			Shallow water camera	33	395027	6102905	395029	6102913	2.73	8.03	8	199	AN	
16-Oct-2012	00:45	1134	TCC_CAM_58			Shallow water camera	33	395025	6102907	395029	6102913	4.33	5.73	7	217	AN	
16-Oct-2012	00:46	1135	TCC_CAM_58			Shallow water camera	33	395019	6102908	395029	6102913	9.93	4.48	11	246	AN	
16-Oct-2012	00:47	1136	TCC_CAM_58			Shallow water camera	33	395016	6102912	395029	6102913	13.30	1.19	13	265	AN	
16-Oct-2012	01:17	1137	TCC_CAM_59			Shallow water camera	38	396390	6104112	396393	6104117	3.05	4.59	6	214	AN	
16-Oct-2012	01:19	1138	TCC_CAM_59			Shallow water camera	38	396393	6104108	396393	6104117	0.46	8.03	8	183	AN	
16-Oct-2012	01:20	1139	TCC_CAM_59			Shallow water camera	38	396396	6104110	396393	6104117	-2.38	6.83	7	161	AN	
16-Oct-2012	01:21	1140	TCC_CAM_59			Shallow water camera	38	396389	6104106	396393	6104117	4.40	10.67	12	202	AN	
16-Oct-2012	01:22	1141	TCC_CAM_59			Shallow water camera	38	396381	6104103	396393	6104117	11.96	13.20	18	222	AN	
16-Oct-2012	01:24	1142	TCC_CAM_59			Shallow water camera	38	396379	6104111	396393	6104117	14.35	5.65	15	249	AN	
16-Oct-2012	01:25	1143	TCC_CAM_59			Shallow water camera	38	396371	6104113	396393	6104117	22.48	3.76	23	261	AN	
16-Oct-2012	01:26	1144	TCC_CAM_59			Shallow water camera	38	396376	6104119	396393	6104117	17.37	-2.24	18	277	AN	
16-Oct-2012	01:28	1145	TCC_CAM_59			Shallow water camera	39	396379	6104119	396393	6104117	14.31	-2.88	15	281	AN	
16-Oct-2012	01:28	1146	TCC_CAM_59			Shallow water camera	38	396380	6104119	396393	6104117	13.44	-2.17	14	279	AN	
16-Oct-2012	01:30	1147	TCC_CAM_59			Shallow water camera	38	396382	6104116	396393	6104117	11.84	0.67	12	267	AN	
16-Oct-2012	01:50	1148	TCC_CAM_60			Shallow water camera	40	396753	6104216	396774	6104217	21.55	0.64	22	268	AN	
16-Oct-2012	01:51	1149	TCC_CAM_60			Shallow water camera	40	396749	6104214	396774	6104217	25.87	3.00	26	263	AN	
16-Oct-2012	01:52	1150	TCC_CAM_60			Shallow water camera	40	396752	6104214	396774	6104217	22.77	3.06	23	262	AN	
16-Oct-2012	01:53	1151	TCC_CAM_60			Shallow water camera	40	396757	6104220	396774	6104217	17.03	-3.10	17	280	AN	
16-Oct-2012	01:55	1152	TCC_CAM_60			Shallow water camera	40	396741	6104223	396774	6104217	33.34	-5.72	34	280	AN	
16-Oct-2012	01:58	1153	TCC_CAM_60			Shallow water camera	40	396742	6104186	396774	6104217	32.05	30.88	45	226	AN	
16-Oct-2012	01:59	1154	TCC_CAM_60			Shallow water camera	40	396766	6104186	396774	6104217	8.22	30.31	31	195	AN	
16-Oct-2012	02:01	1155	TCC_CAM_60			Shallow water camera	41	396749	6104206	396774	6104217	25.27	10.76	27	247	AN	
16-Oct-2012	02:02	1156	TCC_CAM_60			Shallow water camera	40	396742	6104202	396774	6104217	32.20	14.64	35	246	AN	
16-Oct-2012	02:03	1157	TCC_CAM_60			Shallow water camera	40	396740	6104222	396774	6104217	34.29	-5.58	35	279	AN	
16-Oct-2012	02:04	1158	TCC_CAM_60			Shallow water camera	40	396742	6104229	396774	6104217	32.56	-11.90	35	290	AN	
19-Oct-2012	04:44	1159	TCC_TRANS_33			Shallow water camera	71	307434	6086089	307323	6086318	-110.81	228.80			AN	
19-Oct-2012	04:46	1160	TCC_TRANS_33			Shallow water camera	71	307423	6086099	307323	6086318	-99.82	218.53			AN	
19-Oct-2012	04:47	1161	TCC_TRANS_33			Shallow water camera	71	307415	6086107	307323	6086318	-92.45	211.19			AN	
19-Oct-2012	04:52	1162	TCC_TRANS_33			Shallow water camera	71	307401	6086150	307323	6086318	-78.01	168.14			AN	
19-Oct-2012	04:56	1163	TCC_TRANS_33			Shallow water camera	71	307376	6086186	307323	6086318	-52.88	132.25			AN	
19-Oct-2012	04:59	1164	TCC_TRANS_33			Shallow water camera	71	307363	6086208	307323	6086318	-39.93	110.36			AN	
19-Oct-2012	05:01	1165	TCC_TRANS_33			Shallow water camera	71	307359	6086221	307323	6086318	-35.67	97.48			AN	
19-Oct-2012	05:03	1166	TCC_TRANS_33			Shallow water camera	72	307359	6086245	307323	6086318	-36.44	72.81			AN	
19-Oct-2012	05:05	1167	TCC_TRANS_33			Shallow water camera	72	307349	6086256	307323	6086318	-26.01	61.88			AN	
19-Oct-2012	05:07	1168	TCC_TRANS_33			Shallow water camera	72	307349	6086269	307323	6086318	-25.71	48.58			AN	
19-Oct-2012	05:10	1169	TCC_TRANS_33			Shallow water camera	72	307332	6086276	307323	6086318	-9.47	41.55			AN	
19-Oct-2012	07:05	1170	TCC_TRANS_89			Shallow water camera	79	307572	6066412	307566	6066699	-6.13	287.48			AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Imagery Positioning Summary

Job No	9181				Vessel	Vigilant							
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG							
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-6.54	y	-12.64	z	0	
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)			Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
19-Oct-2012	07:06	1171	TCC_TRANS_89			Shallow water camera	79	307571	6066422	307566	6066699	-5.72	277.44			AN	
19-Oct-2012	07:06	1172	TCC_TRANS_89			Shallow water camera	79	307571	6066424	307566	6066699	-5.72	275.53			AN	
19-Oct-2012	07:07	1173	TCC_TRANS_89			Shallow water camera	79	307573	6066430	307566	6066699	-7.02	269.23			AN	
19-Oct-2012	07:07	1174	TCC_TRANS_89			Shallow water camera	78	307573	6066433	307566	6066699	-7.53	265.99			AN	
19-Oct-2012	07:07	1175	TCC_TRANS_89			Shallow water camera	78	307576	6066446	307566	6066699	-9.90	253.00			AN	
19-Oct-2012	07:08	1176	TCC_TRANS_89			Shallow water camera	78	307577	6066452	307566	6066699	-11.34	247.44			AN	
19-Oct-2012	07:11	1177	TCC_TRANS_89			Shallow water camera	79	307569	6066496	307566	6066699	-3.57	203.28			AN	
19-Oct-2012	07:12	1178	TCC_TRANS_89			Shallow water camera	80	307567	6066504	307566	6066699	-1.26	194.93			AN	
19-Oct-2012	07:16	1179	TCC_TRANS_89			Shallow water camera	81	307576	6066558	307566	6066699	-10.01	141.88			AN	
19-Oct-2012	07:16	1180	TCC_TRANS_89			Shallow water camera	81	307579	6066564	307566	6066699	-13.65	135.23			AN	
19-Oct-2012	07:22	1181	TCC_TRANS_89			Shallow water camera	81	307573	6066622	307566	6066699	-6.94	77.72			AN	
19-Oct-2012	07:23	1182	TCC_TRANS_89			Shallow water camera	81	307575	6066640	307566	6066699	-9.48	59.19			AN	
19-Oct-2012	07:25	1183	TCC_TRANS_89			Shallow water camera	80	307575	6066666	307566	6066699	-9.49	33.32			AN	
19-Oct-2012	07:26	1184	TCC_TRANS_89			Shallow water camera	80	307573	6066675	307566	6066699	-7.17	24.62			AN	
19-Oct-2012	07:26	1185	TCC_TRANS_89			Shallow water camera	80	307572	6066677	307566	6066699	-6.53	22.23			AN	
19-Oct-2012	07:26	1186	TCC_TRANS_89			Shallow water camera	80	307572	6066679	307566	6066699	-5.83	20.20			AN	
19-Oct-2012	07:27	1187	TCC_TRANS_89			Shallow water camera	81	307572	6066692	307566	6066699	-5.79	6.97			AN	
19-Oct-2012	07:28	1188	TCC_TRANS_89			Shallow water camera	82	307570	6066700	307566	6066699	-4.19	-0.29			AN	
19-Oct-2012	07:28	1189	TCC_TRANS_89			Shallow water camera	82	307570	6066701	307566	6066699	-4.05	-2.11			AN	
19-Oct-2012	07:28	1190	TCC_TRANS_89			Shallow water camera	82	307570	6066704	307566	6066699	-4.03	-5.09			AN	
19-Oct-2012	07:28	1191	TCC_TRANS_89			Shallow water camera	82	307570	6066707	307566	6066699	-4.04	-7.52			AN	
19-Oct-2012	07:28	1192	TCC_TRANS_89			Shallow water camera	82	307570	6066710	307566	6066699	-4.03	-10.51			AN	
19-Oct-2012	07:29	1193	TCC_TRANS_89			Shallow water camera	82	307570	6066712	307566	6066699	-4.49	-12.28			AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9181				Vessel	Vigilant					
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG					
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-7.34	y	-19.31	z	0
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Deployment Location						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)		Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
22-Sep-12	12:13	1	TCC_GRAB_18	5L	MF & PSA	Mini Hamon Grab	61	258800	6071733	258827	6071741	26.97	7.81	28	254	SKA	
22-Sep-12	13:01	2	TCC_GRAB_16	4.5L	NS	-	58	255547	6069227	255578	6069213	30.68	-13.30	33	293	SKA	
22-Sep-12	13:09	3	TCC_GRAB_16	7L	MF & PSA	Mini Hamon Grab	57	255552	6069234	255578	6069213	25.56	-20.28	33	308	SKA	
22-Sep-12	21:58	4	TCC_GRAB_24	5L	MF&PSA	Mini Hamon Grab	69	278293	6078759	278285	6078722	-8.58	-37.34	38	13	SKA	
22-Sep-12	22:43	5	TCC_GRAB_22	2.5L	NS	-	67	271563	6077871	271585	6077859	22.30	-12.34	25	299	SKA	
22-Sep-12	22:51	6	TCC_GRAB_22	4L	NS	-	67	271584	6077884	271585	6077859	0.82	-25.23	25	358	SKA	
22-Sep-12	22:58	7	TCC_GRAB_22	6L	MF & PSA	Mini Hamon Grab	67	271565	6077896	271585	6077859	20.10	-36.79	42	331	AN	
23-Sep-12	07:53	8	TCC_GRAB_31	5L	MF & PSA	Mini Hamon Grab	89	300697	6082320	300671	6082352	-26.63	32.60	42	141	AN	
23-Sep-12	08:27	9	TCC_GRAB_29	4L	NS	-	79	295417	6081117	295435	6081109	18.21	-8.12	20	294	AN	
23-Sep-12	08:34	10	TCC_GRAB_29	5L	MF & PSA	Mini Hamon Grab	79	295442	6081116	295435	6081109	-6.75	-7.57	10	42	AN	
23-Sep-12	09:06	11	TCC_GRAB_27	4.5L	NS	-	73	290629	6078730	290641	6078722	12.24	-8.71	15	305	AN	
23-Sep-12	09:13	12	TCC_GRAB_27	<1L	NS	-	73	290670	6078706	290641	6078722	-29.10	15.91	33	119	AN	
23-Sep-12	09:20	13	TCC_GRAB_27	5L	MF & PSA	Mini Hamon Grab	73	290678	6078719	290641	6078722	-37.16	2.69	37	94	AN	
23-Sep-12	09:46	14	TCC_GRAB_26	5L	MF & PSA	Mini Hamon Grab	71	286255	6077565	286248	6077558	-6.76	-6.58	9	46	AN	
23-Sep-12	10:01	15	TCC_GRAB_25	5L	MF & PSA	Mini Hamon Grab	71	285983	6078496	285987	6078481	4.71	-14.82	16	342	AN	
27-Sep-12	17:09	16	TCC_GRAB_39	5L	MF & PSA	Mini Hamon Grab	79	317888	6092920	317882	6092923	-6.72	3.50	8	117	SKA	
27-Sep-12	17:55	17	TCC_GRAB_37	0L	NS	-	74	314139	6090615	314110	6090577	-29.00	-37.98	48	37	SKA	Grab failed to trigger
27-Sep-12	18:06	18	TCC_GRAB_37	3.5L	MF	Mini Hamon Grab	74	314121	6090573	314110	6090577	-10.71	3.85	11	110	SKA	
27-Sep-12	18:29	19	TCC_GRAB_37	2.5L	PSA	Mini Hamon Grab	74	314123	6090582	314110	6090577	-13.04	-5.42	14	67	SKA	Shell caught between grab jaws, PSA sample taken
27-Sep-12	18:45	20	TCC_GRAB_37	2L	NS	-	74	314126	6090587	314110	6090577	-15.80	-10.17	19	57	SKA	
27-Sep-12	19:18	21	TCC_GRAB_35	3L	NS	-	80	310910	6088594	310901	6088551	-9.11	-43.48	44	12	SKA	
27-Sep-12	19:27	22	TCC_GRAB_35	6L	MF & PSA	Mini Hamon Grab	80	310911	6088565	310901	6088551	-9.66	-14.74	18	33	SKA	
27-Sep-12	20:04	23	TCC_GRAB_32	0L	NS	-	79	305336	6085258	305325	6085221	-11.65	-37.44	39	17	SKA	Trip wire caught around grab trigger device
27-Sep-12	20:17	24	TCC_GRAB_32	0L	NS	-	79	305325	6085254	305325	6085221	-0.15	-33.16	33	0	SKA	Trip wire damaged.
27-Sep-12	20:34	25	TCC_GRAB_32	0L	NS	-	79	305322	6085255	305325	6085221	2.63	-34.74	35	356	SKA	Grab failed to trigger
27-Sep-12	20:38	26	TCC_GRAB_32	0L	NS	-	79	305341	6085244	305325	6085221	-16.15	-23.34	28	35	SKA	Grab failed to trigger
27-Sep-12	20:45	27	TCC_GRAB_32	5L	MF & PSA	Mini Hamon Grab	80	305311	6085256	305325	6085221	13.58	-34.88	37	339	SKA	
28-Sep-12	00:10	28	TCC_GRAB_40	0L	NS	-	81	324728	6094139	324742	6094127	14.24	-11.87	19	40	AN	Grab failed to trigger
28-Sep-12	00:13	29	TCC_GRAB_40	8L	MF & PSA	Mini Hamon Grab	81	324712	6094132	324742	6094127	29.64	-5.01	30	280	AN	
01-Oct-12	12:21	30	TCC_GRAB_80	6L	MF & PSA	Mini Hamon Grab	64	275086	6063044	275075	6063055	-10.91	11.32	16	136	SKA	
01-Oct-12	12:53	31	TCC_GRAB_79	3.5L	NS	-	64	274133	6063007	274153	6063035	19.46	27.99	34	215	SKA	
01-Oct-12	12:59	32	TCC_GRAB_79	8L	MF & PSA	Mini Hamon Grab	65	274160	6063016	274153	6063035	-7.00	19.33	21	160	SKA	
01-Oct-12	13:49	33	TCC_GRAB_78	2L	NS	-	64	270647	6063247	270622	6063256	-24.89	8.62	26	109	SKA	
01-Oct-12	13:55	34	TCC_GRAB_78	3.5L	PSA	Mini Hamon Grab	61	270623	6063221	270622	6063256	-0.78	34.87	35	179	SKA	
01-Oct-12	14:02	35	TCC_GRAB_78	4.5L	MF	Mini Hamon Grab	65	270639	6063227	270622	6063256	-16.55	28.84	33	150	SKA	
01-Oct-12	16:51	36	TCC_GRAB_82	4L	NS	-	68	279864	6063472	279849	6063517	-14.67	44.17	47	162	SKA	
01-Oct-12	16:58	37	TCC_GRAB_82	7L	MF & PSA	Mini Hamon Grab	68	279838	6063504	279849	6063517	10.96	12.21	16	222	SKA	
01-Oct-12	19:18	38	TCC_GRAB_85	3.5L	MF	Mini Hamon Grab	73	286159	6065255	286188	6065242	29.33	-13.70	32	295	SKA	
01-Oct-12	19:25	39	TCC_GRAB_85	2L	NS	-	73	286166	6065220	286188	6065242	22.44	21.51	31	226	SKA	
01-Oct-12	19:32	40	TCC_GRAB_85	3L	PSA	Mini Hamon Grab	72	286169	6065260	286188	6065242	18.69	-18.28	26	314	SKA	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9181				Vessel	Vigilant					
Client	Forewind Ltd				Vessel Reference Point (VRP)	COG					
Project Name	Teesside Cable Corridor Benthic Survey				Deployment Location		x	-7.34	y	-19.31	z	0
Primary Positioning System	Fugro Starpack XHP				Actual Coordinates derived from	Deployment Location					
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84		Projection	UTM Zone 31N (3° East)		Vertical / Tidal Datum	LAT	

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
01-Oct-12	19:50	41	TCC_GRAB_84	3L	PSA	Mini Hamon Grab	68	284574	6065054	284583	6065021	9.11	-32.58	34	344	SKA	
01-Oct-12	19:58	42	TCC_GRAB_84	3L	NS	-	68	284562	6065019	284583	6065021	21.02	1.96	21	265	SKA	
01-Oct-12	20:05	43	TCC_GRAB_84	4.5L	MF	Mini Hamon Grab	68	284569	6065048	284583	6065021	14.30	-26.55	30	332	SKA	
04-Oct-12	11:12	44	TCC_GRAB_86	3L	PSA	Mini Hamon Grab	73	291633	6065768	291664	6065743	31.33	-25.10	40	309	SKA	
04-Oct-12	11:19	45	TCC_GRAB_86	4.5L	MF	Mini Hamon Grab	73	291618	6065741	291664	6065743	46.43	1.96	46	268	SKA	
04-Oct-12	11:31	46	TCC_GRAB_86	2.5L	NS	-	73	291631	6065752	291664	6065743	32.84	-8.66	34	285	SKA	
04-Oct-12	12:59	47	TCC_GRAB_87	4.5L	NS	-	68	300617	6066895	300631	6066887	13.38	-8.61	16	303	SKA	
04-Oct-12	13:05	48	TCC_GRAB_87	5L	MF & PSA	Mini Hamon Grab	68	300600	6066907	300631	6066887	30.31	-20.13	36	304	SKA	
04-Oct-12	19:35	49	TCC_GRAB_94	5.5L	MF & PSA	Mini Hamon Grab	79	311968	6068127	311964	6068110	-3.96	-16.79	17	13	SKA	
04-Oct-12	19:55	50	TCC_GRAB_93	7L	MF & PSA	Mini Hamon Grab	74	311175	6067951	311162	6067950	-12.78	-1.15	17	13	SKA	
04-Oct-12	20:22	51	TCC_GRAB_92	0L	NS	-	74	310408	6067856	310400	6067829	-8.08	-26.25	27	17	SKA	
04-Oct-12	20:27	52	TCC_GRAB_92	7L	MF & PSA	Mini Hamon Grab	74	310387	6067824	310400	6067829	12.26	5.69	14	245	SKA	
04-Oct-12	20:49	53	TCC_GRAB_90	6L	MF & PSA	Mini Hamon Grab	79	309217	6066894	309236	6066867	19.48	-27.23	33	324	SKA	
05-Oct-12	01:09	54	TCC_GRAB_99	6L	MF & PSA	Mini Hamon Grab	68	317535	6068946	317501	6068953	-34.39	6.88	35	101	AN	
05-Oct-12	22:39	55	TCC_GRAB_95	6.5L	MF & PSA	Mini Hamon Grab	76	314280	6067472	314271	6067468	-9.04	-3.91	10	67	SKA	
05-Oct-12	23:12	56	TCC_GRAB_97	7L	MF & PSA	Mini Hamon Grab	72	315958	6068652	315956	6068632	-2.42	-20.65	21	7	AN	
06-Oct-12	00:21	57	TCC_GRAB_100	6L	MF & PSA	Mini Hamon Grab	72	320928	6069483	320931	6069474	3.05	-8.43	9	340	AN	
06-Oct-12	02:37	58	TCC_GRAB_102	6L	MF & PSA	Mini Hamon Grab	78	327759	6071728	327731	6071721	-28.62	-6.94	29	76	AN	
06-Oct-12	03:10	59	TCC_GRAB_101	5L	MF & PSA	Mini Hamon Grab	76	326739	6071355	326728	6071360	-11.48	5.06	13	114	AN	
06-Oct-12	17:28	60	TCC_GRAB_103	7L	MF & PSA	Mini Hamon Grab	84	336519	6074931	336537	6074950	17.90	19.86	27	222	SKA	
06-Oct-12	21:33	61	TCC_GRAB_107	0L	NS	-	87	351075	6076080	351040	6076074	-35.08	-6.10	36	80	SKA	
06-Oct-12	21:39	62	TCC_GRAB_107	0L	NS	-	86	351032	6076080	351040	6076074	7.08	-6.25	9	311	SKA	
06-Oct-12	21:50	63	TCC_GRAB_107	0L	NS	-	8	351065	6076073	351040	6076074	-25.20	1.02	25	92	SKA	Depth inaccurate due to bow thruster interference.
06-Oct-12	21:57	64	TCC_GRAB_107	5L	MF & PSA	Mini Hamon Grab	87	351058	6076059	351040	6076074	-18.31	15.10	24	130	SKA	
06-Oct-12	22:18	65	TCC_GRAB_106	8.5L	MF & PSA	Mini Hamon Grab	84	350171	6075815	350157	6075813	-14.01	-2.22	14	81	SKA	
08-Oct-12	17:06	66	TCC_GRAB_115	4L	NS	-	49	384669	6080479	384679	6080487	9.53	7.55	12	232	SKA	
08-Oct-12	17:16	67	TCC_GRAB_115	4.5 L	NS	-	49	384692	6080463	384679	6080487	-13.10	23.34	27	151	SKA	
08-Oct-12	17:30	68	TCC_GRAB_115	5L	MF & PSA	Mini Hamon Grab	49	384705	6080481	384679	6080487	-25.90	6.14	27	103	SKA	
08-Oct-12	17:53	69	TCC_GRAB_116	7L	MF & PSA	Mini Hamon Grab	49	385860	6080672	385862	6080667	2.11	-4.81	5	336	SKA	
08-Oct-12	18:21	70	TCC_GRAB_118	6L	MF & PSA	Mini Hamon Grab	43	388020	6081038	388029	6081038	8.78	0.00	32	196	SKA	
08-Oct-12	18:50	71	TCC_GRAB_120	5L	MF & PSA	Mini Hamon Grab	36	391434	6081345	391459	6081369	24.56	24.00	34	226	SKA	
10-Oct-12	14:12	72	TCC_GRAB_114	6L	MF & PSA	Mini Hamon Grab	53	380897	6081121	380868	6081109	-29.75	-12.88	32	67	SKA	
10-Oct-12	16:11	73	TCC_GRAB_113	5L	MF & PSA	Mini Hamon Grab	63	373103	6080193	373065	6080186	-38.91	-7.53	40	79	SKA	
10-Oct-12	17:44	74	TCC_GRAB_112	6.5L	MF & PSA	Mini Hamon Grab	60	371841	6080103	371841	6080086	-0.37	-17.30	17	1	SKA	
10-Oct-12	18:49	75	TCC_GRAB_111	7L	MF & PSA	Mini Hamon Grab	57	370960	6080002	370938	6079985	-21.58	-16.53	27	53	SKA	
10-Oct-12	21:50	76	TCC_GRAB_109	5L	MF & PSA	Mini Hamon Grab	76	360472	6077025	360467	6077017	-4.57	-8.93	10	27	SKA	
13-Oct-12	19:49	77	TCC_GRAB_43	10L	MF & PSA	Mini Hamon Grab	88	335891	6095422	335875	6095391	-16.65	-31.34	35	28	SKA	
13-Oct-12	20:30	78	TCC_GRAB_42	10L	MF & PSA	Mini Hamon Grab	83	334763	6095173	334771	6095150	8.81	-23.02	25	339	SKA	
13-Oct-12	23:19	79	TCC_GRAB_45	6L	MF & PSA	Mini Hamon Grab	79	343702	6097859	343698	6097858	-3.88	-1.43	4	70	AN	
14-Oct-12	00:49	80	TCC_GRAB_46	10L	MF & PSA	Mini Hamon Grab	83	345293	6098201	345283	6098219	-10.48	18.53	21	151	AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9181			Vessel	Vigilant						
Client	Forewind Ltd			Vessel Reference Point (VRP)	COG						
Project Name	Teesside Cable Corridor Benthic Survey			Deployment Location		x	-7.34	y	-19.31	z	0
Primary Positioning System	Fugro Starpack XHP			Actual Coordinates derived from	Deployment Location						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM Zone 31N (3° East)		Vertical / Tidal Datum	LAT		

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
15-Oct-12	08:21	81	TCC_GRAB_47	10L	MF & PSA	Mini Hamon Grab	78	348077	6097713	348071	6097698	-5.96	-15.67	17	21	AN	
15-Oct-12	11:40	82	TCC_GRAB_48	10L	MF & PSA	Mini Hamon Grab	79	353894	6098832	353888	6098841	-6.21	8.90	11	145	SKA	
15-Oct-12	14:11	83	TCC_GRAB_49	9L	MF & PSA	Mini Hamon Grab	80	358842	6099299	358822	6099322	-19.32	23.55	30	141	SKA	
15-Oct-12	17:06	84	TCC_GRAB_52	3L	NS	-	70	366404	6100874	366405	6100887	1.21	12.95	13	185	SKA	
15-Oct-12	17:17	85	TCC_GRAB_52	5L	MF & PSA	Mini Hamon Grab	70	366400	6100912	366405	6100887	4.88	-24.81	25	349	SKA	
15-Oct-12	18:34	86	TCC_GRAB_53	2L	NS	-	67	371384	6100465	371373	6100444	-11.52	-21.15	24	265	SKA	
15-Oct-12	18:45	87	TCC_GRAB_53	0L	NS	-	67	371365	6100449	371373	6100444	7.45	-4.88	9	303	SKA	Grab pre-triggered
15-Oct-12	18:52	88	TCC_GRAB_53	4L	NS	-	66	371398	6100440	371373	6100444	-25.46	4.24	26	99	SKA	
15-Oct-12	19:05	89	TCC_GRAB_53	6L	MF & PSA	Mini Hamon Grab	66	371376	6100446	371373	6100444	-2.89	-1.78	3	58	SKA	
15-Oct-12	20:29	90	TCC_GRAB_54	10L	MF & PSA	Mini Hamon Grab	67	378322	6102064	378320	6102070	-2.28	5.98	6	159	SKA	
15-Oct-12	21:48	91	TCC_GRAB_55	6L	MF & PSA	Mini Hamon Grab	61	386356	6102950	386344	6102953	-12.09	3.49	13	106	SKA	
15-Oct-12	22:51	92	TCC_GRAB_56	6L	MF & PSA	Mini Hamon Grab	48	390773	6103411	390777	6103414	3.91	3.36	5	229	SKA	
15-Oct-12	23:55	93	TCC_GRAB_57	8L	MF & PSA	Mini Hamon Grab	34	394189	6102775	394187	6102773	-2.12	-2.73	3	38	AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

Gardline Geosurvey — Seafloor Sampling Positioning Summary

Job No	9181			Vessel	Vigilant						
Client	Forewind Ltd			Vessel Reference Point (VRP)	COG						
Project Name	Teesside Cable Corridor Benthic Survey			Deployment Location		x	-7.34	y	-19.31	z	0
Primary Positioning System	Fugro Starpack XHP			Actual Coordinates derived from	Deployment Location						
Geodetic Reference System	Datum	WGS84	Ellipsoid	WGS84	Projection	UTM Zone31N (3° East)			Vertical / Tidal Datum	COG	

Date	Time (UTC/GMT)	Fix number	Stn No	Penetration	Sample Retention	Retention	Observed Seafloor Depth (m)	Actual coordinates		Target coordinates		Offset from target				Surveyor	Remarks
								Easting	Northing	Easting	Northing	dE	dN	Range	Bearing		
18-Oct-2012	07:33	1	TCC_CHEM_18	45%	CHEM	Day Grab	63	258840	6071740	258827	6071741	-12.54	1.12	13	95	AN	
18-Oct-2012	07:48	2	TCC_CHEM_18	70%	CHEM	Day Grab	63	258844	6071742	258840	6071740	-4.57	-2.11	5	65	AN	
18-Oct-2012	09:39	3	TCC_CHEM_27	60%	CHEM	Day Grab	70	290623	6078747	290641	6078722	18.29	-25.29	31	324	AN	
18-Oct-2012	09:52	4	TCC_CHEM_27	30%	NS	-	10	290620	6078757	290623	6078747	3.40	-9.86	10	341	AN	Depth inaccurate due to bow thruster interference
18-Oct-2012	09:59	5	TCC_CHEM_27	30%	NS	-	70	290627	6078743	290623	6078747	-4.13	3.38	5	129	AN	Depth inaccurate due to bow thruster interference
18-Oct-2012	10:09	6	TCC_CHEM_27	10%	NS	-	7	290625	6078749	290623	6078747	-1.76	-2.12	3	40	AN	Depth inaccurate due to bow thruster interference
18-Oct-2012	10:24	7	TCC_CHEM_27	70%	CHEM	Day Grab	78	290621	6078739	290623	6078747	2.14	8.09	8	195	AN	
18-Oct-2012	11:38	8	TCC_CHEM_86	<10%	NS	-	7	291648	6065736	291664	6065743	16.12	7.54	18	245	SKA	Depth inaccurate due to bow thruster interference
18-Oct-2012	11:47	9	TCC_CHEM_86	<10%	NS	-	12	291638	6065741	291664	6065743	26.17	2.51	26	265	SKA	Depth inaccurate due to bow thruster interference
18-Oct-2012	13:58	10	TCC_CHEM_86	40%	CHEM	Day Grab	73	291640	6065725	291664	6065743	24.54	18.59	31	233	SKA	
18-Oct-2012	14:14	11	TCC_CHEM_86	50%	CHEM	Day Grab	73	291638	6065725	291640	6065725	1.49	-0.26	2	280	SKA	
18-Oct-2012	15:38	12	TCC_CHEM_95	60%	CHEM	Day Grab	77	314268	6067457	314271	6067468	3.39	11.40	12	197	SKA	
18-Oct-2012	15:55	13	TCC_CHEM_95	50%	CHEM	Day Grab	78	314271	6067457	314268	6067457	-3.07	-0.06	3	89	SKA	
18-Oct-2012	17:01	14	TCC_CHEM_102	40%	CHEM	Day Grab	80	327723	6071712	327731	6071721	7.77	8.41	11	223	SKA	
18-Oct-2012	17:39	15	TCC_CHEM_102	10%	NS	-	80	327722	6071714	327723	6071712	0.45	-1.61	2	344	SKA	
18-Oct-2012	18:00	16	TCC_CHEM_102	80%	CHEM	Day Grab	80	327727	6071711	327723	6071712	-4.44	1.60	5	110	SKA	
18-Oct-2012	19:48	17	TCC_CHEM_109	50%	CHEM	Day Grab	77	360461	6077046	360467	6077017	6.44	-29.28	30	348	SKA	
18-Oct-2012	20:01	18	TCC_CHEM_109	70%	CHEM	Day Grab	77	360467	6077045	360461	6077046	-6.52	0.89	7	98	SKA	
18-Oct-2012	21:15	19	TCC_CHEM_114	40%	CHEM	Day Grab	52	380866	6081124	380868	6081109	1.96	-15.64	16	353	SKA	
18-Oct-2012	21:26	20	TCC_CHEM_114	40%	CHEM	Day Grab	52	380867	6081128	380866	6081124	-1.06	-3.56	4	17	SKA	
18-Oct-2012	22:35	21	TCC_CHEM_54	10%	NS	-	67	378331	6102100	378320	6102070	-10.46	-29.93	32	19	SKA	
18-Oct-2012	22:43	22	TCC_CHEM_54	40%	CHEM	Day Grab	66	378318	6102070	378320	6102070	2.08	0.81	2	249	SKA	
18-Oct-2012	22:55	23	TCC_CHEM_54	40%	CHEM	Day Grab	66	378314	6102066	378318	6102070	3.90	4.10	6	224	SKA	
19-Oct-2012	00:56	24	TCC_CHEM_48	40%	CHEM	Day Grab	78	353890	6098848	353888	6098841	-1.62	-7.02	7	13	AN	
19-Oct-2012	01:11	25	TCC_CHEM_48	40%	CHEM	Day Grab	78	353884	6098847	353890	6098848	5.51	1.15	6	258	AN	
19-Oct-2012	02:59	26	TCC_CHEM_40	50%	CHEM	Day Grab	81	324738	6094112	324742	6094127	3.42	15.29	16	193	AN	
19-Oct-2012	03:13	27	TCC_CHEM_40	70%	CHEM	Day Grab	81	324734	6094112	324738	6094112	4.74	-0.11	5	271	AN	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)									QPRO-0753
Job No: 9181			**Area:** Teesside Cable Corridor		**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012			**Page:** 1 of 17		**Client:** Forewind Ltd			**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey								**Equipment:** Freshwater Lens Camera/Shallow Water Camera	
Sample Number	**Station Number**	**Time on overlay**	**DVD/ Video No**	**DVD Chapter**	**Counter (start & end)**	**Sediment Description**		**Comments**	**TOT FIXES**	**FIXES Nos**
Date: 20-Sep-2012 WX- NW 4-5, 1m swell										
1	TCC_CAM_15	19:16	1	1	00:00	Fine silty sand with gravel, pebbles, cobbles and shell fragments. Patches of bedrock with occassional boulderss. Observed Fauna: *Asterias rubens* , Hydrozoa (including *Nemertesia* sp.), Bryozoa (including Cellariidae, *Flustra foliacea*), squat lobster (*Munida* sp.), *Ophiura albida* , *Spirobranchus lamarcki* tubes, occasional single *Sabellaria* sp. tube, Scaphopoda shells, Caridae, Brachyura, Pisces (possible sand eel and Gobiidae), Pectinidae, Polychaeta ,*Alcyonium digitatum* , Actinaria (possible *Urticina* sp.)			12	1-12
		19:34	1		17:00					
2	TCC_CAM_16	20:06	1	2	00:00	Fine silty sand with gravel, pebbles, cobbles and shell fragments. Patches of bedrock with occassional boulders. Observed fauna: Hydrozoa, Bryozoa, *Alcyonidium diaphanum, Ophiura albida, Asterias rubens, Alcyonium digitatum* , Actiniaria, Cancer pagurus, *Spirobranchus lamarcki* tubes, Scaphopoda shells, *Sabella pavonia* tubes, Caridae, *Ebalia* sp., Pisces (juvenile)			12	13-24
		20:23	1		16:45					
3	TCC_CAM_17	20:52	1	3	00:00	Fine silty sand with gravel, pebbles, cobbles and shell fragments. Patches of bedrock with occassional boulders. Observed fauna: Hydrozoa, Bryzoa (including *Flustra foliacea* and Cellariidae), *Pagurus* sp., *Ophiura albida, Ophiothrix fragilis, Alcyonium digitatum, Alcyonidium diaphanum* , Euphasida, *Stichastrella rosea, Sabellidae, Spirobranchus lamarcki* tubes, Scaphopoda shells, Polychaeta , *Munida* sp., *Asterias rubens* , Gobiidae, possible sand eel, *Ebalia* sp., *Pagurus* sp., Brachyura, *Sabella pavonia* tubes/ possible bivalve siphons			14	25-38
		21:12	1		19:46					

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)									QPRO-0753
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS		
Date: from: 20-Sept-2012 to: 19-Oct-2012		**Page:** 2 of 17		**Client:** Forewind Ltd			**Scale bar:** 1cm		
Project: Teesside Cable Corridor Benthic Survey							**Equipment:** Freshwater Lens Camera/Shallow Water Camera		

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
WX NW6, 1-1.5m swell. Operations ceased due to weather at 21:45 GMT.									
Date: 22-Sep-2012 WX: NNW F5 (17kts), 1.5m swell.									
4	TCC_CAM_19	10.43 11:01	2 1	1/2/3	00:00 Chapt 1: 3:48 Chapt 2: 16:46	Fine - medium sand with shell fragments. One small boulder observed. Observed fauna: Possible *Nephtys caeca* (00:33 into chatper 2 of dvd), *Echinocardium cordatum*, Bryozoa, Hydrozoa, Serpulidae, *Asterias rubens*, Porifera, *Ophiura albida*, Euphausiid, Polychaeta and bioturbation.	DVD and Video paused to put out additional umbilical. (Useful footage untill 1:15 on chapter 2).	26	39-64
5	TCC_CAM_18	11:40 11:59	2 1	4/5	00:00 19:30	Fine silty sand with some gravel and shell fragments. Sand ripples and faunal burrows. Observed fauna: Hydrozoa (including *Nemertesia*), Bryozoa (including possible *Alcyonidium diaphanum* and Cellariidae), *Ophiura albida, Asterias rubens, Alcyonium digitatum, Echinus esculentus, Spirobranchus* sp., Caridae, Sabellidae, *Strichastrella rosea, Pagurus* spp., Brachyura, Holothuroidea, Gobiidae, Actinaria, Porifera		12	65-76
6	TCC_CAM_20	14:54 15:12	3 1	1/2	00:00 18:34	Fine-medium sand and shell fragments. Sand ripples and faunal burrows. Observed fauna Hydrozoa, *Alcyonium digitatum, Pagurus* sp., Sabellaridae, *Spirobranchus lamarcki* tubes, Gobiidae, juvenile Pisces, Actinaria		11	77-87
7	TCC_CAM_21	15:47 16:48	3/4 1	3/4/5	00:00 Chapt 4: 41:07 Chapt 5:	Fine silty sand, patches of boulders and cobbles. Observed fauna: *Alcyonium digitatum, Spirobranchus* sp., dense colonies of Bryozoa and Hydrozoa, *Asterias rubens*, possible *Corystes cassivelaunus*, Ascidia, possible *Flustra* sp. colonies, *Echinus esculatus,* Porifera, Gobiidae, Caridae, Scaphapoda, Actinaria, *Hyas* sp., *Nemertesia* sp., *Munida rugosa, Lophius piscatorius*		14	77-102

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)									QPRO-0753
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant				**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012		**Page:** 3 of 17		**Client:** Forewind Ltd				**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey								**Equipment:** Freshwater Lens Camera/Shallow Water Camera	
Sample Number	**Station Number**	**Time on overlay**	**DVD/ Video No**	**DVD Chapter**	**Counter (start & end)**	**Sediment Description**		**Comments**	**TOT FIXES**	**FIXES Nos**
8	TCC_CAM_22	19:23	4	2/3	00:00	Fine to medium sand, shell fragments and sand ripples. Cobble/boulders. Observed fauna: Crustacea, Euphausiidae*Alcyonium digitatum, Asterias rubens, Astropecten irregularis, Pagurus* sp., Sabellidae, Porifera, Hydrozoa,*Pennatula phosphorea*, Ascidiacea, Gobiidae, *Spirobranchus lamarcki* tubes, *Ophuira* sp., *Munida* sp., *Aequipecten opercularis*, possible *Alcyonidium diaphanum, Stichastrella rosea,* Brachyura		DVD did not start at the same time as video.	15	103-117
		19:52	2		16:45					
9	TCC_CAM_23	20:21	4	4/5	00:00	Fine to medium sand with shell fragments, occasional cobbles and boulders. Faunal burrows. Observed fauna: Hydrozoa, Actinaria, *Echinus esculentus* , Euphausiidae, Scaphopoda,*Spirobranchus* sp., *Alcyonium digitatum, Astropecten irregularis, Asterias rubens, Pagurus* sp., possible Porifera, possible cushion star			12	118-129
		20:41	2		19:00					
10	TCC_CAM_24	21:35	5	1/2	00:00	Fine to medium sand with shell fragments and sand ripples Observed fauna: Possible *Ammodytes* sp., tube worm, Pectinariidae, *Astropecten irregularis, Alcyonium digitatum*, Flustridae, Scaphapoda, Actinaria, Hydrozoa,*Munida sp., Spirobranchus lamarcki* tubes, faunal tubes/bivalve siphons,*Aequipecten opercularis*		.	11	130-140
		21:44	2		19:21					
Date: 23-Sep-2012 WX: v/a F 2-3, 0.5m swell.										
11	TCC_CAM_25	23:30	5	3/4	00:00	Fine-medium sand with ocassional silt, shell fragments and sand ripples Observed Fauna: Possible Porifera (4:00 on dvd), unidentified shrimp, Annelida (*Lanice conchilega*), faunal burrows, bioturbation, Arthropoda (*Ebalia* sp.), Cnidaria (*Funicula quadrangularis, Pennatula phosphorea*)		First photo and first 1:50 of footage has no nav-string on overlay. From 07:20 till 11:00 of dvd footage is in the water column	14	141-154
		00:55	2		19:19					

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)				QPRO-0753
Job No: 9181	**Area:** Teesside Cable Corridor	**Vessel:** Vigilant	**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012	**Page:** 4 of 17	**Client:** Forewind Ltd	**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey			**Equipment:** Freshwater Lens Camera/Shallow Water Camera	

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
12	TCC_CAM_26	01:34	5	5/6/7	00:00	Fine- medium sand with silt and occasional shell fragments. Observed Fauna: Crustacea (*Pagurus bernhardus*), Annelida (*Lanice conchilega*), Faunal burrows, bioturbation, Arthropoda (*Ebalia* sp., *Pagurus* sp.), Cnidaria (*Pennatula phosphorea*, *Alcyonium digitatum*, possible *Virgularia mirabilis*), Pisces (Unidentified sp. at start of video, on first photo - v. camoflaged), *Lophius piscatorius* (can see slighty better on video 4:06 into chapter 7), Hydrozoa (*Nemertesia* sp.), Echinodermata (*Asterias rubens*)	Two chapters of the clapper board on this DVD (5 & 6)	19	155-173
		01:51	2		17:19				
13	TCC_CAM_27	02:47	5/6	8/1/2	00:00	Fine-medium sand with ocassional silt, shell fragments and sand ripples Observed Fauna: Possible *Nephtys caeca,* possible Porifera, unidentified shrimp. Annelida (*Lanice conchilega*), faunal burrows, bioturbation, Echinodermata (*Asterias rubens*), Cnidaria (*Pennatula phosphorea*)	Clapper board on chaper 8 says 28 so redone on new DVD 6	14	174-187
		03:04	2		17:12				
14	TCC_CAM_28	04:00	6	3/4/5	00:00	Fine-medium sand with ocassional silt, shell fragments and sand ripples Observed Fauna: Possible *Nephtys caeca,* possible Porifera, Euphasiid, Annelida (*Lanice conchilega*), faunal burrows, bioturbation, Hydrozoa (*Nemertesia sp*.), possible Cnidaria (*Pennatula phosphorea; Alcyonium digitatum* (video)), Echinodermata (*Asterias rubens)*, Arthropoda (*Ebalia sp.*), Pisces		12	188-199
		04:17	2		16:27				
15	TCC_CAM_29	05:00	6	6/7	00:00	Fine-medium sand with ocassional silt, shell fragments and sand ripples Observed Fauna: possible Porifera, Annelida, faunal burrows, bioturbation, Cnidaria (*Pennatula phosphorea, Alcyonium digitatum*), Arthropoda (*Pagurus* sp.), Echinodermata (Asteroidea), Hydrozoa (*Nemertesia* sp.)	Note: Dead mans fingers in photos was not attached to seabed. Away from seabed from 04:30-5:20	10	200-209
		05:18	2		17:00				
16	TCC_CAM_30	06:02	7	1/2/3	00:00	Fine-medium sand with ocassional shell fragments and sand ripples. Observed Fauna: Possible Porifera, unidentified shrimps, Annelida, faunal burrows, bioturbation, Hydrozoa (*Flustra foliacea*), Cnidaria (*Pennatula phosphorea*), Pisces	Overlay still showing 29 during the clapper board but correct for footage. Useful footage until 11:00 into chapter 2	14	210-223
		06:25	2		Chapt 1: 14:31 Chapt 2: 5:36				

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)				QPRO-0753
Job No: 9181	**Area:** Teesside Cable Corridor	**Vessel:** Vigilant	**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012	**Page:** 5 of 17	**Client:** Forewind Ltd	**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey			**Equipment:** Freshwater Lens Camera/Shallow Water Camera	

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
17	TCC_CAM_31	07:16	7	4/5/6	00:00	Fine-medium sand with sparse shell fragments and sand ripples. Observed Fauna: possible Porifera,Annelida, Hydrozoa*(Nemertesia sp.*), Burrows, Cnidaria (*Pennatula phosphorea*), Cnidaria (*Alcyonium digitatum*)	**Note:** The depth on the 4th fix is wrong (depth goes to 283m on overlay 4:15 into chapter 5). Pause in footage due to recovering excess umbilical (Useful footage until 6:50 on chapter 1) Started 3rd video part way through station	16	224-239
		07:35	2/3		Chapt 5: 7:26 Chapt 6:10:10				
18	TCC_CAM_32	11:29	8	1/2	00:00	Fine sediment with ripples, easily disturbed. Observed fauna:*Pennatula phosphorea*, *Alcyonium digitatum, Spirobranchus lamarcki* tubes, *Ophiura sp.* , Asteroidea, Hydrozoa, Polychaeta,*Ophiopholis aculeata, Asterias rubens* , Porifera, faunal tubes/bivalve siphons and bioturbation		13	240-252
		11:49	3		20:28				
19	TCC_CAM_33	12:28	8	3/4	00:00	Fine to medium sand with fines veneer, shell fragments and gravel. Occasional cobble and boulders. Observed fauna: Potential occasional single Sabellaria sp. tube,*Alcyonium digitatum*, *Spirobranchus lamarcki* tubes, Hydrozoa,*Pennatula phosphorea, Nemertesia antennina, Asterias rubens, Munida rugosa,* Actinaria	100m transect east to cover feature seen on sonar data	17	253-269
		12:59	3		31:37				
20	TCC_CAM_34	13:44	9	1/2	00:00	Fine to medium sand with faunal burrows	This station was abandoned due to weather conditions WX. SE 5-6 0.5m increasing	1	270
		13:48	3		04:00				
Date: 26-Sep-2012 WX: N F 3, 1.5m swell.									
21	TCC_CAM_34	14:17	9	3/4	00:00	Fine to medium sand, some fines and shell fragments. Observed fauna: Hydrozoa, faunal tubes/bivalve siphons, Sabellidae, Ophiuroidae, Flustridae, *Astropecten irregularis, Pecten maximus, Pennatula phosphorea, Alcyonium digitatum,* Polychaeta		11	271-281
		14:35	3		19:29				

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)				QPRO-0753
Job No: 9181	**Area:** Teesside Cable Corridor	**Vessel:** Vigilant	**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012	**Page:** 6 of 17	**Client:** Forewind Ltd	**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey			**Equipment:** Freshwater Lens Camera/Shallow Water Camera	

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
22	TCC_CAM_35	15:26	9	5/6	00:00	Fine to medium sand, easily disturbed; suspended sediment in water. Observed fauna: Faunal tubes/bivalve siphons, Sabellidae,*Pennatula phosphorea, Alcyonium digitatum,* Asteroidea (possible*Asterias rubens*), Hydrozoa, Scaphapoda	Beacon problems	9	282-290
		15:44	3		22:02				
23	TCC_CAM_36	16:39	10	1/2	00:00	Silty sand covering bedrock, shell crust. Observed fauna: Occasional faunal burrows and tubes/siphons,*E. esculentus,* Hydrozoa, Ascidiacea, Bryozoa including*Flustra sp., Alyconium digitatum, Spirobranchus lamarcki, Ebalia sp.,* possible Porifera, possible squat lobster (Fix 293), Sabellidae, possible Gobiidae, Asteroidea	Beacon problems	11	291-301
		17:02	3		22:07				
24	TCC_CAM_37	17:37	10	3/4	00:00	Fine to medium sand with some shell fragments. Observed fauna: Faunal burrows and tubes/bivalve siphons, Polychaeta (possible Nereidae), Hydrozoa,*Asterias rubens*, Actinaria, *Pennatula phosphorea*, cushion star, Ophiuroidea, juvenile Pisces	Bubbles on lens. Camera topside overlay changed to TCC from TTC	11	302-312
		17:59	3		19:47				
25	TCC_CAM_38	18:56	10	5/6	00:00	Fine sand, easily disturbed. Observed fauna: Hydrozoa, *Pennatula phosphorea*, *Sabella* tubes, yellow polychaete (Fix313), Ophiuroidea (including *Ophiura ophiura*), possible Porifera and faunal burrows. Faunal tubes/bivalve siphons	Problem keeping camera on seabed. Video often unclear due to disturbed sediment in water column. Operations suspended after this station due to weather	8	313- 320
		19:12	3		15:48				
Date: 27-Sep-2012 WX: NNW F 4 , 1- 1.5m swell.									
26	TCC_CAM_38	14:35	11	1/2	00:00	Oberved fauna: *Alyconium digitatum, Pennatula phosphorea,* Hydrozoa	Station revisited with shallow water camera after unsuccessful footage with freshwater lens camera. Footage not much better due to swell and only one lamp on camera frame	7	321-327
		14:56	4		18:12				

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)									QPRO-0753
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant				**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012		**Page:** 7 of 17		**Client:** Forewind Ltd				**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey								**Equipment:** Freshwater Lens Camera/Shallow Water Camera	
Sample Number	**Station Number**	**Time on overlay**	**DVD/ Video No**	**DVD Chapter**	**Counter (start & end)**	**Sediment Description**		**Comments**	**TOT FIXES**	**FIXES Nos**
27	TCC_CAM_39	15:55	11	3/4	00:00	Fine to medium sand with some shell fragments. Observed fauna: Faunal tubes/siphons, *Pennatula phosphorea,* Hydrozoa, *Sabella* tubes, faunal burrows, possible Sipuncula worms		Moved back to working with the fresh water lens camera	10	328- 337
		16:18	4		23:00					
28	TCC_CAM_41	22:13	11	5/6	00:00	Fine to medium sand with occasional shell fragments, faunal tubes/siphons. Observed fauna: *Sabella* tubes, *Pennatula phosphorea,* Asteroidea, possible juvenile squat lobster (Fix 352), faunal burrows, Ophiuroidea, Polychaeta		Rope/wire comes into view during video. Possibly winch wire	11	338-348
		22:31	4		18:00					
29	TCC_CAM_40	23:09	12	1/2	00:00	Fine, easily disturbed sediment with ripples and occasional shell fragments. Faunal burrows. Observed fauna: Annelida (Polychaeta, *Sabella* tubes), Cnidaria (*Alyconium digitatum, Pennatula phosphorea*), Crustacea (Decopoda (Fix 7)), Echinodermata (*Asterias rubens*), faunal burrows			10	349-358
		23:29	4		18:46					
30	TCC_CAM_42	01:27	12	3/4	00:00	Fine silty, easily disturbed sediment, faunal burrows and ripples. Occasional shell fragment. Observed fauna: Echinodermata (*Asterias rubens*), Cnidaria (*Pennatula phosphorea*), Hydrozoa, possible *Aepuipecten irregularis*, Annelida		Freshwater lens. Last station today due to bad weather	16	359-374
		01:46	4		19:00					
Date: 01-Oct-2012 WX: SW F 5, 1.5 m swell.										
31	TCC_CAM_78	08:39	12	5/6	00:00	Rippled coarse sand with shell fragments. Observed fauna: Cnidaria (*Alcyonium digitatum*), tubes, burrows, possible Bryozoa, *Tubularia indivisa*		Beacon occasionally losing depth (e.g. 09:18 through chapter 6 says 400m)	14	375-388
		08:52	4		16:54					

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)					QPRO-0753
Job No: 9181	**Area:** Teesside Cable Corridor	**Vessel:** Vigilant	**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS		
Date: from: 20-Sept-2012 to: 19-Oct-2012	**Page:** 8 of 17	**Client:** Forewind Ltd	**Scale bar:** 1cm		
Project: Teesside Cable Corridor Benthic Survey			**Equipment:** Freshwater Lens Camera/Shallow Water Camera		

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
32	TCC_CAM_79	09:36	13	1/2	00:00	Rippled coarse sand with shell fragments. Observed fauna: Cnidaria (*Alcyonium digitatum*), Arthropoda (*Pagurus bernhardus*, possible *Pagurus prideaxi* with *Adamsia carcinopados*), Echinodermata (possible *Asterias rubens*)		15	389-403
		09:52	4		00:16				
33	TCC_CAM_80	10:19	13	3,/4/5/6	00:00	Rippled coarse sand with shell fragments, occasional small cobbles and one boulder (observed at 05:24 on chapter 4) . Observed fauna: Cnidaria (*Alcyonium digitatum*), possible Actinaria (retracted), Echinodermata (*Asterias rubens*)	V5 malfunctioned at the end of chapter 4 and Chapter 5 was not on target. Note: at the end of chapter 6 the vessel had moved stightly off target	15	404-418
		10:47	4		Chapt 4: 7:46 Chapt 5: 0:20 Chapt 6: 7:36				
34	TCC_CAM_81	11:25	13	7/8	00:00	Fine to medium sand with shell fragments and sand ripples. Gravel, pebbles and boulders. Observed fauna:*Alcyonium digitatum, Flustra* sp., *Spirobranchus lamarcki* tubes, *Echinus* sp., *Pagurus bernhardus,* Ophiuroidea (including Amphiuridae),*Asterias rubens*, Scaphapoda, Hydrozoa,*Munida* sp., Actinaria (possible *Sagartia elegans* var. *rosea*), Polychaeta		24	419-442
		11:54	4		05:00				
35	TCC_CAM_83	15:00	14	1/2	00:00	Fine to medium sand with ripples. boulders. Observed fauna: Faunal tubes/siphons, *Flustra* sp., *Spirobranchus lamarcki*, *Cancer pagurus, Pagurus bernhardus*, Hydrozoa,*Alcyonium digitatum, Alcyonidium diaphanum, Echinus esculentus*, Pisces (possible poor cod), *Nemertesia antennina*, possible *Sagartia elegans, Asterias rubens,* Ophiuroidea, Porifera, Brachyura,*Urticina* sp., Scaphapoda, *Pennatula phosphorea*, Caridae		21	443-463
		15:18	5		18:00				
36	TCC_CAM_82	15:58	14	3/4	00:00	Fine to medium rippled sand with shell fragments and fines. Observed fauna: *Alcyonium digitatum, Alcyonidium diaphanum*, Hydrozoa, *Lophius piscatorius*, Pectinaridae, *Pagurus bernhardus*, Brachyura, Polychaeta, possible Porifera (Fix 484) faunal tubes and burrows	Beacon occasionally losing depth	15	464-478
		16:15	5		16:04				

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)									QPRO-0753
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant				**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012		**Page:** 9 of 17		**Client:** Forewind Ltd				**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey								**Equipment:** Freshwater Lens Camera/Shallow Water Camera	
Sample Number	**Station Number**	**Time on overlay**	**DVD/ Video No**	**DVD Chapter**	**Counter (start & end)**	**Sediment Description**		**Comments**	**TOT FIXES**	**FIXES Nos**
37	TCC_CAM_84	18:02	14	5/6	00:00	Sand with ripples and shell fragments and fines.Observed fauna:Faunal tubes/siphons, possible Pleuronectidae; (video 18:07:10) Hydrozoa, *Pagurus bernhardus*, *Asterias rubens*		Beacon occasionally losing depth	10	479-488
		18:18	5		15:52					
38	TCC_CAM_85	18:46	15	1/2	00:00	Very silty sand, a lot of ripple marks in different directions, faunal burrows and some shell fragments. Observed fauna:*Asterias rubens,* Hydrozoa, possible*Alcyonium sp*., Polychaeta, Asteroidea			8	489-496
		19:05	5		18:50					
39	TCC_CAM_86	20:56	15	3/4	00:00	Observed fauna: Faunal tubes		Video paused while vessel out of range. Station later abandoned due to weather conditions WX 5-6 (24kts) swell 1m and increasing	3	497-499
		21:00	5		04:40					
Date: 04-Oct-2012 WX: NW F 4, 1m swell.										
40	TCC_CAM_86	10:44	15	5/6	00:00	Fine, easily disturbed sediment with ripples and occasional shell fragments. Observed fauna: Annelida (Polychaeta), Cnidaria (Hydrozoa) Crustacea (Caridae), faunal burrows		Repeat of station	14	500-513
		11:01	5		16:44					
41	TCC_CAM_87	12:34	16	1/2	00:00	Fine to medium sand sand ripples, some fine shell fragments. Observed fauna: Hydrozoa, Asteroidea, faunal burrows/tubes/siphons, *Virgularia* sp., *Nephtys* sp.			12	514-525
		12:49	5		14:44					
42	TCC_CAM_88	13:50	16	3/4	00:00	Sand with ripples and shell fragments and patches of fines. Observed fauna: Faunal burrows/tubes/siphons. Polychaeta, possible encrusting *Alcyonium* sp. on worm tube? (Fix 532)			13	526-538
		14:07	5		16:22					

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)				QPRO-0753
Job No: 9181	**Area:** Teesside Cable Corridor	**Vessel:** Vigilant	**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012	**Page:** 10 of 17	**Client:** Forewind Ltd	**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey			**Equipment:** Freshwater Lens Camera/Shallow Water Camera	

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
43	TCC_CAM_89	14:47	16	5/6	00:00	Fine to medium sand with shell fragments, pebbles, cobbles and boulders. Observed fauna: Bryozoa (including *Nemertesia antennina*), *Pennatula phosphorea, Spirobranchus* sp. tubes, *Ophiura albida, Munida* sp., *Echinus esculentus* , Crustacea, *Alcyonium digitatum* , Asteroidea, Cnidaria (*Pennatula phosphorea*), Actiniaria		31	539-569
		15:12	5		25:25				
44	TCC_CAM_90	15:44	17	7/8	00:00	Silty sand with shell fragments. Observed fauna: Faunal tubes/siphons, Hydrozoa, *Alcyonium* sp., *Asterias rubens, Pagurus* sp.		8	570-577
		16:05	5		21:06				
45	TCC_CAM_91	16:51	17	3/4	00:00	Fine to medium sand with ripples, shell fragments, cobbles and boulders. Observed fauna: *Munida* sp., *Flustra* sp., *Alcyonium digitatum, Pagurus* sp., Actiniaria		18	578-595
		17:10	6		19:10				
46	TCC_CAM_92	17:34	17	5/6	00:00	Fine to medium sand with sand ripples and shell fragments. Observed fauna: Faunal tubes/siphons, *Henricia* sp., *Pagurus* sp., *Ophiura albida* , *Alcyonium digitatum, Pleuronectiformes*	Current increasing	10	596-605
		17:51	6		16:55				
47	TCC_CAM_93	18:17	18	1/2	00:00	Sand with occasional cobbles. Observed fauna: Faunal tubes, *Pennatula phosphorea, Asterias rubens, Urticina* sp., Hydrozoa, *Alcyonium digitatum*		10	606-615
		18:38	6		20:27				
48	TCC_CAM_94	19:06	18	3/4	00:00	Fine to medium sand with sand ripples, shell fragments and pebbles. Observed fauna: Faunal tubes, *Virgularia* sp., *Pennatula phosphorea, Alcyonium digitatum, Pagurus* sp., Pleuronectiformes, *Ammodytes* sp.	Strong currents	12	616-627
		19:25	6		19:30				
49	TCC_CAM_95	21:32	18	5/6	00:00	Silty sand with shell fragments and ripples. Observed fauna: *Astropecten irregularis, Pennatula phosphorea,* Hydrozoa, *Alcyonium* sp., faunal tubes/siphons/burrows		10	628-637
		21:50	6		17:56				

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)					QPRO-0753
Job No: 9181	**Area:** Teesside Cable Corridor	**Vessel:** Vigilant	**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS		
Date: from: 20-Sept-2012 to: 19-Oct-2012	**Page:** 11 of 17	**Client:** Forewind Ltd	**Scale bar:** 1cm		
Project: Teesside Cable Corridor Benthic Survey			**Equipment:** Freshwater Lens Camera/Shallow Water Camera		

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
50	TCC_CAM_96	22:19	19	1/2	00:00	Fine to medium sand with shell fragments, gravel, pebbles, cobbles and boulders. Observed fauna:*Munida* sp., *Asterias rubens, Pennatula phosphorea, Alcyonium digitatum*, Ophiuroidea, Hydrozoa		18	638-655
		22:41	6		22:02				
51	TCC_CAM_97	23:07	19	3/4	00:00	Coarse sand with shell fragments and sand ripples. Observed fauna: Hydrozoa, faunal burrows, Annelida (*Aphrodite* sp.), Arthropoda (*Pagurus prideaxi*, *Crangon crangon*), Cnidaria (*Adamsia carcinopodos*, *Pennatula phosphorea*), Echinodermata (*Asterias rubens)*		13	656-668
		23:23	6		16:14				
Date: 05-Oct-2012 WX: SW F 5, 1m swell.									
52	TCC_CAM_98	23:47	20	1/2	00:00	Fine easily disturbed sediment with ripples and patches of cobbles and shell fragments. Observed Fauna: Annelida (Polychaeta), Cnidaria (*Alcyonium digitatum,* Hydrozoa, *Urticina* sp.), Crustacea (Amphipoda, Caridae, *Ebalia* sp., *Munida* sp., *Pagarus bernhardus*), encrusted coraline algae, Pisces, faunal burrows, Bryozoa		18	669-686
		00:06	6		18:19				
53	TCC_CAM_99	00:36	20	3/4	00:00	Sand with ripples with occassional cobbles and shell fragments. Observed Fauna: Possible*Virgularia mirabilis* (fix 690); *Pagurus* sp. (video ~7:20) Bryozoa (video ~9:40), possible*Pecten maximus* and *Nereidae* sp. (fix 691)		14	687-700
		00:55	6		18:55				
Date: 06-Oct-2012 WX: W F 4, 1m swell.									
54	TCC_CAM_100	23:50	20	5/6	00:00	Brown sandy clay with ripples and occasional shell fragments. Observed fauna: Faunal burrows, Nephtydae (video only), Hydrozoa, *Pennatula phosphorea, Asterias rubens* (video only), Amphipoda		13	701-713
		00:08	7		18:41				
55	TCC_CAM_101	01:25	21	1/2	00:00	Fine brown sand, Silty with fines. Suspends easily, rippled. Observed fauna: Cnidaria (*Pennatula phosphorea, Virgularia* sp.), Echinodermata (*Astropecten irregularis)*, burrows and Hydrozoa		13	713-725
		01:44	7		19:06				
56	TCC_CAM_102	02:09	21	3/4	00:00	Fine sand with ripples and occasional shell fragments. Observed fauna: *Pennatula phosphorea*, *Alcyonium digitatum,* Polychaeta, Errantia (possible Nereidae), tubes/siphons, Arthropoda, burrows	5 min of chapter 3 stationcard	13	726-738
		02:24	7		14:58				

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)					QPRO-0753
Job No: 9181	**Area:** Teesside Cable Corridor	**Vessel:** Vigilant	**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS		
Date: from: 20-Sept-2012 to: 19-Oct-2012	**Page:** 12 of 17	**Client:** Forewind Ltd	**Scale bar:** 1cm		
Project: Teesside Cable Corridor Benthic Survey			**Equipment:** Freshwater Lens Camera/Shallow Water Camera		

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
57	TCC_CAM_103	04:37 04:41	21 7	5/6	00:00 06:44	Fine brown sand with shell fragments and ripples. Observed fauna: *Pennatula phosphorea, Alcyonium digitatum*	Station abandoned due to weather, no longer able to hold station. Stopped video at 6.44mins	3	739-741
58	TCC_CAM_103	16:47 17:15	22 7	1/2/3	00:00 Chapt 2: 8:00 Chapt 3: 11:00	Fine brown sand with shell fragments and ripples (with silt). Observed fauna: *Asterias rubens, Pennatula phosphorea, Alcyonium digitatum* (~4:00 on chapter 3), Decopoda, tubes and burrows	Break in footage due to beacon losing depth and temporarily going off station	11	742-752
59	TCC_CAM_104	18:19 18:41	22 7	4/5	00:00 22:07	Fine brown sand with shell fragments and ripples (with silt). Observed fauna: *Pennatula phosphorea, Alcyonium digitatum,* possibe encrusting *Alcyonium sp.,* Pisces (Pleuronectiformes and possible dragonet), *Asterias rubens* , possible Porifera, faunal burrows and tubes		8	753-760
60	TCC_CAM_105	19:08 19:30	22/23 7	6/7/1	00:00 Chapt 7: 6:00 Chapt 1: 15:24	Fine brown sand with shell fragments and ripples (with silt). Observed fauna: *Aphrodita aculeata* , faunal tracks and burrow with faecal casts, *Pennatula phosphorea, Astropecten irregularis,* tube worms, possibe encrusting *Alcyonium sp.* , Nereidae		10	761-770
61	TCC_CAM_106	20:17 20:38	23 7	2/3	00:00 20:50	Fine brown sand with shell fragments and ripples (with silt). Observed fauna: *Astropecten irregularis, Pennatula phosphorea,* possible Porifera (~6:00), possibe encrusting *Alcyonium sp.* , *Virgularia mirabilis,* possible Hydrozoa, burrows and tubes, possible jellyfish (~10:50 on video)		11	771-781
62	TCC_CAM_107	20:57 21:17	23 7	4/5	00:00 20:31	Fine brown sand with shell fragments and ripples (with silt and some shell fragments). Observed fauna: possibe encrusting *Alcyonium sp.* , *Virgularia mirabilis* , *Pennatula phosphorea* , *Pagurus bernhardus* , faunal tubes and burrows		10	782-791
63	TCC_CAM_108	23:31 23:35	24 8	1/2	00:00 04:00	Silty sediment with occasional shell fragments	Station abandoned due to swell	1	792

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)				QPRO-0753
Job No: 9181	**Area:** Teesside Cable Corridor	**Vessel:** Vigilant	**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012	**Page:** 13 of 17	**Client:** Forewind Ltd	**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey			**Equipment:** Freshwater Lens Camera/Shallow Water Camera	

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
Date: 08-Oct-2012 WX: SW F 4, 1.5-2 m swell.									
64	TCC_CAM_120	11:51 12:16	24 8	3/4/5	00:00 Chapt 5: 17:46	Fine to medium sand with shell fragments and sand ripples. Observed fauna: Pleuronectiformes, Ctenophora,*Astropecten irregularis,* Hydrozoa, faunal burrows	Chapter 4= bubbles on lens so recovered to disperse	10	793-802
65	TCC_CAM_119	12:49 13:07	24 8	6/7	00:00 17:26	Fine to medium sand with occasional shell fragments and sand ripples. Observed fauna:*Astropecten irregularis*, Hydrozoa and faunal burrows		10	803-812
66	TCC_CAM_118	13:44 14:02	24 8	8/9	00:00 18:17	Fine to medium sand with shell fragments and sand ripples. Observed fauna: *Pagurus bernhardus*, Hydrozoa, faunal tubes and burrows		7	813-819
67	TCC_CAM_117	14:35 14:52	25 8	1/2	00:00 17:00	Fine to medium sand with occasional shell fragments and sand ripples. Observed fauna: Pisces (Pleuronectiformes on video ~4:50), possible Hydrozoa, burrows		11	820-830
68	TCC_CAM_116	15:27 15:41	25 8	3/4	00:00 15:50	Fine to medium sand with shell fragments and sand ripples. Observed fauna: Burrows and some faunal tubes, Hydrozoa		8	831-838
69	TCC_CAM_115	16:15 16:31	25 8	5/6	00:00 16:50	Fine to medium sand with gravel, pebbles, and shell fragments. Observed fauna: Numerous*Alcyonium digitatum*, Asteroidea on video (possibly *Stichastrella rosea*)		10	839-848
70	TCC_CAM_114	19:54 20:11	26 8	1/2	00:00 17:58	Fine to medium sand with shell fragments and sand ripples. Observed fauna: *Astropecten irregularis*, *Pagurus bernhardus*, *Asterias rubens, Alcyonium digitatum,* Ophiuroidea, Pisces (Pleuronectiformes and Gobiidae)		10	849-858
Date: 10-Oct-2012 WX: SW F 3, 1-1.5 m swell.									
71	TCC_CAM_113	15:19 15:55	26/27 8	3/4/5/1	00:00 Chapt 4: 3:54 Chapt 5: 17:00 Chapt 1: 7:02	Fine to medium sand with occasional shell fragments and sand ripples. Observed fauna: Pisces (possible monkfish or skate, ~15:20 on Chapt 5 of dvd) and burrows	Note: Pause due to V5 error and the vessel moving off location. 2nd pause when dvd ran out. First photo in water column has no fix)	10	859-868

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)									QPRO-0753
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant				**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012		**Page:** 14 of 17		**Client:** Forewind Ltd				**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey								**Equipment:** Freshwater Lens Camera/Shallow Water Camera	
Sample Number	**Station Number**	**Time on overlay**	**DVD/ Video No**	**DVD Chapter**	**Counter (start & end)**	**Sediment Description**		**Comments**	**TOT FIXES**	**FIXES Nos**
72	TCC_CAM_112	17:04	27	2/3	00:00	Fine to medium sand with silt, occasional shell fragments and sand ripples. Observed fauna:*Pagurus bernhardus*, Pisces (numerousPleuronectiformes), burrows		17:11:50 till 17:15:09 out of target. Some beacon problems	8	869-876
		17:28	9		24:03					
73	TCC_CAM_111	18:17	27	4/5	00:00	Fine to medium sand with silt, occasional shell fragments and sand ripples. Observed fauna:*Pagurus bernhardus*, Pisces (possible *Pleuronectes platessa*)			9	877-885
		18:34	9		15:48					
74	TCC_CAM_110	19:19	28	1/2/3	00:00	Fine to medium sand with silt, occasional shell fragments and sand ripples. Observed fauna:*Pagurus bernhardus*, Pisces (Pleuronectiformes ~2:44 on chapt 2, possible dragonet at ~2:50 on chapt 2), *Alcyonium digitatum* (0:45 on chapt 3), Brachyura (~3:00 on chapt 2), *Pagurus bernhardus* (5:30 on chapt 3)			10	886-895
		19:38	9		Chapt 2: 10:00 Chapt 3: 6:55					
75	TCC_CAM_108	20:35	28	4/5	00:00	Fine to medium sand with silt, occasional shell fragments and sand ripples. Observed fauna:*Pennatula phosphorea,* Pleuronectiformes, faunal burrows, Decopoda, Asteroidea,*Ammodytes* sp. and *Pagurus bernhardus*			9	896-904
		20:55	9		20:00					
76	TCC_CAM_109	21:19	28	6/7	00:00	Fine to medium sand with silt, occasional shell fragments and sand ripples. Observed fauna: Asteroidea, Actinaria, possible*Ammodytes* sp., *Pagurus bernhardus*, *Pennatula phosphorea*, *Alcyonium digitatum*, *Myxine glutinosa*, faunal burrows and tracks			10	905-914
		21:34	9		16:20					
Date: 13-Oct-2012 WX: L/A, 1.5m swell										
77	TCC_CAM_43	18:34	29	1/2	00:00	Silty sand with shell fragments and easily suspended fines. Observed fauna: *Pennatula phosphorea*, *Pagurus* sp., *Myxine glutinosa*			11	915-925
		19:02	9		27:35:00					
78	TCC_CAM_44	21:25	29	3/4	00:00	Silty sand with some gravel, shell and shell fragments, occasional cobbles. Observed fauna: Juvenile gadoid,*Pennatula phosphorea, Alcyonium digitatum, Myxine glutinosa*, possible *Sabellaria sp*. (occasional tube),*Pagarus* sp. with *Adamsia carcinopados,* Hydrozoa			11	926-936
		21:52	9		27:30:00					

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)									QPRO-0753
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant				**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012		**Page:** 15 of 17		**Client:** Forewind Ltd				**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey								**Equipment:** Freshwater Lens Camera/Shallow Water Camera	

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
79	TCC_CAM_45	22:42	30	1/2	00:00	Silty sand with sand ripples and occasional shell fragments. Observed fauna: Chordata,*Flustra foliacea* , *Pennatula phosphorea*, *Virgularia* sp., *Alcyonium digitatum* , Porifera		8	937-944
		23:03	10		20:21				
80	TCC_CAM_46	00:10	30	3/4	00:00	Fine sand with ripples and occasional shell fragments. Observed fauna: *Pennatula phosphorea*, *Alcyonium digitatum* , Polychaeta, Hydrozoa, Echinodermata, *Asterias rubens* , burrows		9	945-953
		00:26	10		15:55				
81	TCC_CAM_47	02:08	30	5/6	00:00	Sand with fines. Observed fauna:*Pennatula phosphorea*, *Alcyonium digitatum* , Euphasiid, Hydrozoa/branching Bryozoa	Recovered to deck, 2-3m swell, hard to keep station, down on weather	11	954-964
		02:29	10		21:15				
Date: 15-Oct-2012 WX: W2, 1.5-2m swell									
83	TCC_CAM_48	09:11	31	1/2	00:00	Sand ripples. Observed fauna:*Pennatula phosphorea*, *Alcyonium digitatum* , Actiniaria, Asteroidea		29	965-993
		09:35	10		24:00				
84	TCC_CAM_50	12:29	31	3/4	00:00	Fine sand, sand ripples with occasional shell fragments. Observed fauna: *Pennatula phosphorea*, *Alycyonium digitatum* , faunal burrows		8	994-1001
		12:49	10		20:21				
85	TCC_CAM_49	13:30	32	1/2	00:00	Fine sand, sand ripples with shell fragments. Observed fauna: *Pennatula phosphorea, Alcyonium digitatum*	Swapped to shallow water frame, due to large swell which was causing freshwater lens to re-suspend sediment	8	1002-1009
		13:57	10		26:00				
86	TCC_CAM_51	15:08	32	3/4	00:00	Fine sand with ripples, shell and shell fragments. Observed fauna: *Pennatula phosphorea*, *Henricia* sp.		20	1010-1029
		15:29	10		20:42				

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)				QPRO-0753
Job No: 9181	**Area:** Teesside Cable Corridor	**Vessel:** Vigilant	**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS	
Date: from: 20-Sept-2012 to: 19-Oct-2012	**Page:** 16 of 17	**Client:** Forewind Ltd	**Scale bar:** 1cm	
Project: Teesside Cable Corridor Benthic Survey			**Equipment:** Freshwater Lens Camera/Shallow Water Camera	

Sample Number	Station Number	Time on overlay	DVD/ Video No	DVD Chapter	Counter (start & end)	Sediment Description	Comments	TOT FIXES	FIXES Nos
87	TCC_CAM_52		33	1/2	00:00	Fine sand with ripples, shell and shell fragments. Observed fauna: *Pennatula phosphorea, Cancer pagurus*, Porifera		15	1030-1044
		16:25	11		17:55				
88	TCC_CAM_53	18:00	33	3/4	00:00	Fine sand with ripples, shell and shell fragments. Observed fauna: Porifera		25	1045-1069
		18:19	11		18:40				
89	TCC_CAM_54	19:55	33	5/6	00:00	Fine sand with ripples, and occasional shell fragments. Observed fauna *Pennatula phosphorea*, *Pagurus* sp., *Aphrodite* sp.		10	1070-1079
		20:16	11		21:17				
90	TCC_CAM_55	21:21	34	1/2	00:00	Fine sand with ripples, shell and shell fragments. Observed fauna: *Buccinum undatum*, *Pagurus* sp. with *Adamsia carcinopados*		16	1080-1095
		21:37	11		15:33				
91	TCC_CAM_56		34	3/4	00:00	Fine sand with ripples, shell and shell fragments. Observed fauna: Porifera, Asteroidea, Chordata, possible Hydrozoa, *Alcyonium digitatum*		16	1096-1111
		22:42	11		14:04				
92	TCC_CAM_57	23:31	34	5/6	00:00	Fine rippled sand and shell Observed fauna: Pleuronectiformes		12	1112-1123
		23:45	11		14:13				
Date: 16-Oct-2012 WX: W2, 1.5-2m swell									
93	TCC_CAM_58	00:35	35	1/2	00:00	Sand ripples with gravel and with lots of shell and shell fragments. Observed fauna: Jellyfish and/or Ctenophore, possible Ammodytidae, *Agonus cataphractus*, *Pagurus* sp.		13	1124-1136
		00:47	11		12:34				
94	TCC_CAM_59	01:21	35	3/4	00:00	Sand ripples. Observed fauna: *Asterias rubens*, Ammodytidae, Ctenophore, *Alcyonidium diaphanum*		11	1137-1147
		01:34	11		12:40				
95	TCC_CAM_60	01:50	35	5/6	00:00	Coarse sand and shell, some ripples. Observed fauna: *Pagurus* sp., Chordata (Pleuronectiformes), *Adamsia carcinopados*		11	1148-1158
		02:04	11		14:00				

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED IMAGERY LOG SHEET (Deck)									QPRO-0753
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS		
Date: from: 20-Sept-2012 to: 19-Oct-2012		**Page:** 17 of 17		**Client:** Forewind Ltd			**Scale bar:** 1cm		
Project: Teesside Cable Corridor Benthic Survey							**Equipment:** Freshwater Lens Camera/Shallow Water Camera		
Sample Number	**Station Number**	**Time on overlay**	**DVD/ Video No**	**DVD Chapter**	**Counter (start & end)**	**Sediment Description**	**Comments**	**TOT FIXES**	**FIXES Nos**
Date: 19-Oct-2012 WX: S3, 1m swell									
96	TRANS_33	04:44	36	1/2	0:00	Boulders, cobbles, shell fragments and some sediment. Observed fauna: *Munida* sp., Pagurus prideauxi, *Echinus* sp., *Asterias rubens, Henricia* sp.), Hydrozoa, *Alcyonium* sp., *Pennatula phosphorea*, *Adamsia carcinopados*, Pleuronectiformes, possible Porifera		10	1159-1169
		05:14	12		30:00				
97	TRANS_89	07:04	37	1/2	0:00	Sand, sand ripples, shell fragments, boulders, cobbles, bedrock, some underlying clay and bioturbation.Observed fauna:*Alcyonium* sp., *Pennatula phosphorea*, Actiniaria, Hydrozoa *Nemertesia* sp., *Cancer pagurus, Pagurus* sp., Galatheidae, Majidae - possible *Macropodia* sp., *Corystes cassivelaunus* , Bryozoa (branching - mainly Sertulariidae), possible Scaphopoda, Polychaeta (possible *Ditrupa* sp.)	Bedrock with characteristics of stony reef but extent is patchy	24	1170-1192
		07:37	12		33:28				

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS
Date: from: 22-Sep-12 to: 16-Oct-12		**Page:** 1 of 9		**Client:** Forewind Ltd			**Sieve Size:** 1mm **Equipment:** Mini Hamon Grab
Project: Teesside Cable Corridor Benthic Survey							
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
Date: 22-Sep-2012 Weather: Light Airs 0 - 0.5 m Swell							
1	TCC_GRAB_18	12:13	5L	Fauna/PSA	1mm	Fine sand with some shell fragments and shells. Oberved fauna:*Pagurus* sp., Serpulidae, Scaphapoda shells. Munsel: 2.5Y 3/2	
2	TCC_GRAB_16	13:01	4.5L	NS	-	No Sample	Low Retention
3	TCC_GRAB_16B	13:09	7L	Fauna/PSA	1mm	Fine-medium sand with shell fragments, pebbles, gravel and some shell fragments. Observed fauna: *Ebalia* sp., *Lanice conchilega*/*Sabella pavonina*, Polychaeta, *Macropodia* sp., *Pomatoceros lamarcki*, Bryozoa (*Membranipora membranacea*). Munsel: 2.5Y 3/1	
4	TCC_GRAB_24	21:58	5L	Fauna/PSA	1mm	Fine to medium sand with shell fragments. Observed fauna: Polychaeta, juvenile Ophiuroidae, small Bivalvia. Munsel: 2.5Y 3/2	
5	TCC_GRAB_22	22:43	2.5L	NS	-	No Sample	Low Retention
6	TCC_GRAB_22B	22:51	4L	NS	-	No Sample	Low Retention
7	TCC_GRAB_22C	22:58	6L	Fauna/PSA	1mm	Fine to medium sand with some small shell fragments. Observed fauna: juvenile Ophiuroidae, Bivalvia, Polychaeta, Isopoda,*Echinocardium chordatum*. Munsel: 2.5Y 3/3	
Date: 23-Sep-2012 Weather: 1-2 knots 0-0.5m swell							
8	TCC_GRAB_31	07:53	5L	Fauna/PSA	1mm	Fine brown/grey sand. Observed fauna: Ophiuroida sp., Amphipod, worm casts. Munsel: 2.5Y 4/4	Possible fragment of archaeological interest - kept and logged
9	TCC_GRAB_29	08:27	4L	NS	-	No Sample	Low Retention
10	TCC_GRAB_29	08:34	5L	Fauna/PSA	1mm	Fine dark brown sand. Observed fauna: *Astropecten irregularis, Echinocardium cordatum*, Polychaeta, Ophiuroidea, annelid casts, Bivalvia. Munsel: 5Y 4/3	Possible fragment of archiological interest - kept and logged
11	TCC_GRAB_27	09:06	4.5L	NS	-	No Sample	Low Retention
12	TCC_GRAB_27	09:18	<1L	NS	-	No Sample	Low Retention
13	TCC_GRAB_27	09:20	5L	Fauna/PSA	1mm	Very fine dark brown sand. Observed fauna: Ophiuroidea,*Echinocardium cordatum*, Amphipoda, Polychaeta. Munsel: 5Y 4/3	Repositioned vessel to attempt re-sampling

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No:	9181	**Area:**	Teesside Cable Corridor	**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS
Date:	from: 22-Sep-12 to: 16-Oct-12	**Page:**	2 of 9	**Client:** Forewind Ltd			**Sieve Size:** 1mm **Equipment:** Mini Hamon Grab
Project:	Teesside Cable Corridor Benthic Survey						

Sample Number	Station Number	Time	Load	Retention	Sieving Comments	Sediment Description	Comments
14	TCC_GRAB_26	09:46	5L	Fauna/PSA	1mm	Fine dark borwn sand. Observed fauna:*Astropecten irregularis*, Terabellidae, Polychaeta. Munsel: 5Y 4/3	
15	TCC_GRAB_25	10:01	5L	Fauna/PSA	1mm	Fine dark borwn sand. Observed Fauna: Polychaeta, Ophiuroidea. Munsel: 5Y 4/3	
Date: 27-Sep-2012 Weather: NNW 4, 1-1.5m Swell							
16	TCC_GRAB_39	17:09	5L	Fauna/PSA	1mm	Fine dark sand, quite stiff, no odour. Observed fauna: Ophiuroidae, Polychaeta, Actiniaria, Bryozoa, Hydrozoa, Pectinariidae, Amphipoda, possible*Mya* sp., possible *Thyasira* sp, Scaphapoda shells. Munsel: 2.5Y 3/1	
17	TCC_GRAB_37	17:55	0L	NS	-	No Sample	Grab failed to trigger
18	TCC_GRAB_37A	18:06	3.5L	Fauna	1mm	Lots of shell fragments, some whole shells and pebbles. Observed fauna: Ophiuroidae, Polychaeta, Bryozoa,*Echinocardium chordatum*	Labelled accidentally in dump tray photo as TCC_GRAB_37B and in Hamon Grab Picture as TCC_GRAB_37.
19	TCC_GRAB_37B	18:29	2.5L	PSA	-	Fine to medium stiff dark brown sand, some shell fragments, no odour. Munsel: 2.5Y 3.1	
20	TCC_GRAB_37C	18:45	2L	NS	-	No Sample	Stone caught in jaw
21	TCC_GRAB_35	19:18	3L	NS	-	No Sample	Low Retention
22	TCC_GRAB_35B	19:27	6L	Fauna/PSA	1mm	Fine stiff dark brown sand, no odour. Observed fauna: Ophiuroidea, Sabelleridae tube, Polychata. Munsel: 2.5Y 3/1	
23	TCC_GRAB_32	20:04	0L	NS	-	No Sample	Trip wire caught around grab trigger shackle
24	TCC_GRAB_32	20:17	0L	NS	-	No Sample	Wire caught around shackle again and wire kinked. Switched to back up Hamon grab after this
25	TCC_GRAB_32	20:34	0L	NS	-	No Sample	Back up Hamon grab failed to trigger
26	TCC_GRAB_32	20:38	0L	NS	-	No Sample	Back up Hamon grab failed to trigger again. Recovered to deck to investigate; pulleys greased with WD40
27	TCC_GRAB_32B	20:45	5L	Fauna/PSA	1mm	Fine to medium dark brown sand with some fines and small shell fragments. No odour. Observed fauna: Polychaeta. Munsel: 5Y 2.5/2	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS
Date: from: 22-Sep-12 to: 16-Oct-12		**Page:** 3 of 9		**Client:** Forewind Ltd			**Sieve Size:** 1mm
							Equipment: Mini Hamon Grab
Project: Teesside Cable Corridor Benthic Survey							
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
28	TCC_Grab 40	00:10	N/A	N/A	N/A	No Sample	Grab failed to trigger
29	TCC_Grab 40	00:13	8L	Fauna/PSA	1mm	Fine dark borwn sand. Few shells and shell fragments. Observed Fauna: Polychaeta, Ophiuroidea, Echinoidea. Munsel: 5Y 3/2	
Date: 01-Oct-2012 Weather: WX: SW, F5, 1.5m swell							
30	TCC_GRAB_80	12:21	6L	Fauna/PSA	1mm	Fine to medium dark olive brown sand with numerous shell fragments. No odour. Observed fauna: *Echinocardium chordatum, Spatangus purpureus*, Sipuncula, *Virgularia* sp., *Spirobranchus* sp., *Lanice conchilega* tube, Scaphapoda shells. Munsel: 5Y 2.5/2	
31	TCC_GRAB_79	12:53	3.5L	NS	-	No Sample	Low Retention
32	TCC_GRAB_79B	12:59	8L	Fauna/PSA	1mm	Fine to medium olive brown sand with shell fragments. No odour, stiff sand. Observed fauna: *Echinocardium chordatum,* Bivalvia (possible *Dosinia exoleta* and Thraciidae) Polychaeta. Munsel: 5Y 4/2	
33	TCC_GRAB_78	13:49	2L	NS	-	No Sample	Low Retention
34	TCC_GRAB_78B	13:55	3.5L	PSA	-	Fine to medium olive brown stiff sand with many shell fragments. Some gravel and pebbles. No odour. Munsel: 5Y 4/2	
35	TCC_GRAB_78C	14:02	4.5L	Fauna	1mm	Observed fauna: *Alcyonium diaphanum*, *Spirobranchus* sp., Bryozoa, Polychaeta, Scaphopoda shells	
36	TCC_GRAB_82	16:51	4L	N/S	-	No Sample	Low Retention
37	TCC_GRAB_82B	16:58	7L	Fauna/PSA	1mm	Fine to medium olive brown sand with shell fragments. Observed fauna: Sabelleriidae, *Virgularia* sp., *Ensis* sp., Hydrozoa, Ophiuroidea, *Lanice conchilega* tube, Bivalvia and Scaphopoda shells. Munsel: 5Y 3/1	
38	TCC_GRAB_85	19:18	3.5L	Fauna	1mm	Observed fauna: Ophiuroidea, Polychaeta	
39	TCC_GRAB_85B	19:25	2L	NS	-	No Sample	Low Retention
40	TCC_GRAB_85C	19:32	3L	PSA	-	Fine to medium stiff olive brown sand with few shell fragments. No odour. Munsel 5Y 3/2	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS
Date: from: 22-Sep-12 to: 16-Oct-12		**Page:** 4 of 9		**Client:** Forewind Ltd			**Sieve Size:** 1mm **Equipment:** Mini Hamon Grab
Project: Teesside Cable Corridor Benthic Survey							
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
41	TCC_GRAB_84	19:50	3L	PSA	-	Fine to medium olive brown sand with few shell fragments. No odour. Munsel: 5Y 3/1	
42	TCC_GRAB_84B	19:58	3L	N/S	-	No Sample	Low Retention
43	TCC_GRAB_84C	20:05	4.5L	Fauna	1mm	Observed fauna: Ophiuroidea, Amphipoda, *Echinocardium chordatum*, Polychaeta	
Date: 04-Oct-2012							
44	TCC_GRAB_86a	11:12	3L	PSA	-	Fine dark brown sand with muddy odour and some fines. Munsel: 5Y 2.5/1	
45	TCC_GRAB_86b	11:19	4.5L	Fauna	1mm	Observed fauna: *Virgularia* sp., Ophiuroidea, Amphipoda, Bivalvia, Polychaeta (including Nereididae)	
46	TCC_GRAB_86c	11:31	2.5L	NS	-	No Sample	Low Retention
47	TCC_GRAB_87	12:59	4.5L	NS	-	No Sample	Low Retention
48	TCC_GRAB_87b	13:05	5L	Fauna/PSA	1mm	Fine to medium sand with some fines. Dark brown, springy-mud. Observed fauna: *Echinocardium chordatum*, Ophiuroidea, Polychaeta, *Sabella pavonina* tube. Munsel: 10YR 3/1.	
49	TCC_GRAB_94	19:35	5.5L	Fauna/PSA	1mm	Fine to medium sand with fines. Few shell fragments. Observed fauna: Bivalvia, Polychaeta. Munsel: 2.5Y 2.5/1.	Foot plate removed from grab for deeper penetration
50	TCC_GRAB_93	19:55	7L	Fauna/PSA	1mm	Fine sand with some fines and shell fragments. Dark brown mud. Observed fauna: Polychaeta, Bivalvia, *Echinocardium chordatum*, Scaphopoda, Amphipoda. Munsel: 2.5Y 2.5/1.	
51	TCC_GRAB_92	20:22	0L	NS	-	No Sample	Water only in grab
52	TCC_GRAB_92b	20:27	7L	Fauna/PSA	1mm	Fine sand with fines and shell fragments. Dark brown, mud. Observed fauna: Scaphopoda, Amphipoda, Polychaeta (including Nereididae). Munsel: 2.5Y 3/1.	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No:	9181	**Area:**	Teesside Cable Corridor	**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS
Date:	from: 22-Sep-12 to: 16-Oct-12	**Page:**	5 of 9	**Client:** Forewind Ltd			**Sieve Size:** 1mm **Equipment:** Mini Hamon Grab
Project:	Teesside Cable Corridor Benthic Survey						

Sample Number	Station Number	Time	Load	Retention	Sieving Comments	Sediment Description	Comments
53	TCC_GRAB_90	20:49	6L	Fauna/PSA	1mm	Fine dark brown sand with fines and some shell fragments. Observed fauna: Polychaeta, Bivalvia, Amphipoda, Ophiuroidea, Scaphopoda, Cnidaria skeleton, *Virgularia* sp. Munsel: 2.5Y 2.5/1	
Date: 05-Oct-2012							
54	TCC_GRAB-99	01:09	6L	Fauna/PSA	1mm	Fine dark brown sand with shell fragments. Observed fauna: Polychaeta. Munsel: 5Y 2.5/2	
55	TCC_GRAB_95	22:39	6.5L	Fauna/PSA	1mm	Very dark grey sediment some fines. Observed fauna: Polychaeta,*Echinocardium cordatum*. Munsel: 2.5Y 3/1	
56	TCC_GRAB_97	23:12	7L	Fauna/PSA	1mm	Fine black mud with large shell fragments. Observed fauna: Polychaeta. Munsel: 2.5Y 2.5/1	
Date: 06-Oct-2012 Weather: WX: , W4 , 1.5m swell							
57	TCC_GRAB_100	00:21	6L	Fauna/PSA	1mm	Fine very dark greyish brown sediment with small shell fragments. Observed fauna: Scaphapoda, Polychaeta. Munsel: 2.5Y 3/2	
58	TCC_GRAB_102	02:37	6L	Fauna/PSA	1mm	Fine dark olive brown sediment with shell fragments. Observed fauna: *Echinocardium cordatum*, *Nephtys* sp., Amphipoda, Polychaeta. Munsel: 2.5Y 3/3	
59	TCC_GRAB_101	03:10	5L	Fauna/PSA	1mm	Fine very dark greyish brown sediment with small shell fragments. Observed fauna: Brachyura, Ophiuroidea, Polychaeta, Platyhelminthes, possible juvenile/larva. Munsel: 2.5Y 3/2	
60	TCC_GRAB_103	17:28	7L	Fauna/PSA	1mm	Fine sand with fines component, Dark brown with muddy odour. Observed fauna: Crustacea (Amphipoda, Cumacea), Echinodermata (Ophiuroidea), Mollusca (Bivalvia including *Thyasira sp.,* Scaphopoda), Polychaeta. Munsel: 2.5Y 2.5/1	
61	TCC_GRAB_107	21:33	0L	NS	-	No Sample	Grab triggered in water column
62	TCC_GRAB_107	21:39	0L	NS	-	No Sample	Grab triggered in water column

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS
Date: from: 22-Sep-12 to: 16-Oct-12		**Page:** 6 of 9		**Client:** Forewind Ltd			**Sieve Size:** 1mm **Equipment:** Mini Hamon Grab
Project: Teesside Cable Corridor Benthic Survey							
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
63	TCC_GRAB_107	21:50	0L	NS	-	No Sample	Grab triggered on impact with water surface, so redeployed after resetting. Triggered again before hitting seabed
64	TCC_GRAB_107	21:57	5L	Fauna/PSA	1mm	Fine silty sand, dark grey/brown, muddy odour. Observed fauna: Polychaeta, Bivalvia. Munsel: 2.5Y 2.5/1	
65	TCC_GRAB_106	22:18	8.5L	Fauna/PSA	1mm	Fine silty dark grey/brown sand, muddy odour. Observed fauna: Polychaeta, Bivalvia, possible Holothurian, Ophiuroidea. Munsel: 2.5Y 3/1.	
Date: 08-Oct-2012 Weather: WX: ,SW F4 , 1.5m swell							
66	TCC_GRAB_115	17:06	4L	NS	-	No Sample	Low Retention
67	TCC_GRAB_115	17:16	4.5 L	NS	-	No Sample	Low Retention
68	TCC_GRAB_115	17:30	5L	Fauna/PSA	1mm	Fine to coarse sand, gravel, pebbles and cobbles. Olive brown, no odour. Observed Fauna: *Spirobranchus* sp., *Alcyonium digitatum*, Echinoidea, Ophiuroidea. Munsel: 2.5Y 4/3	Station card says CABA instead of TCC_Grab.
69	TCC_GRAB_116	17:53	7L	Fauna/PSA	1mm	Fine sand with fines component. Dark grey/brown. Muddy odour. Observed Fauna: Bivalvia. Polychaeta, Amphipoda, Ophiuroidea. Munsel: 2.5Y 2.5/1	Station card says CABA instead of TCC_Grab.
70	TCC_GRAB_118	18:21	6L	Fauna/PSA	1mm	Fine to medium sand with fine component, shell fragments. Olive brown with muddy odour. Observed Fauna: Ophiuroidea, Polychaeta,*Echinocardium cordatum, Aphrodite aculeata,* Echinoidea. Munsel: 2.5Y 4/3	Station card says CABA instead of TCC_Grab.
71	TCC_GRAB_120	18:50	5L	Fauna/PSA	1mm	Stiff fine-medium olive sand with darker brown fines component and shell fragments. Muddy odour. Observed Fauna: Scaphopoda, Bivalvia, Paguridae, Nereididae, Polychaeta,*Corystes cassivelaunus*. Munsel: 2.5Y 4/2	Station card says CABA instead of TCC_Grab.
Date: 10-Oct-2012 Weather: WX: , SW F2-3 , 1.0-1.5m swell							
72	TCC_GRAB_114	14:12	6L	Fauna/PSA	1mm	Fine-medium olive brown sand with fines component and black anoxic layers. Some shell fragments. Organic noxious smell. Observed Fauna: Bivalvia,Ophiuroidea, Polychaeta,*Echinocardium cordatum*. Munsel: 5Y 3/2	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS
Date: from: 22-Sep-12 to: 16-Oct-12		**Page:** 7 of 9		**Client:** Forewind Ltd			**Sieve Size:** 1mm **Equipment:** Mini Hamon Grab
Project: Teesside Cable Corridor Benthic Survey							
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
73	TCC_GRAB_113	16:11	5L	Fauna/PSA	1mm	Fine dark olive brown sand with darker brown organic patches and some fines. Muddy odour. Observed Fauna: Polychaeta, Bivalvia, Ophiuroidea. Munsel: 5Y 3/2	
74	TCC_GRAB_112	17:44	6.5L	Fauna/PSA	1mm	Fine dark olive brown sand with some fines and organic darker brown component Muddy organic odour. Observed Fauna: Bivavles, Echinoidea, Amphipoda, Ophiuroidea, Polychaeta,*Echinocardium cordatum*, Nereididae. Munsel: 5Y 4/2	
75	TCC_GRAB_111	18:49	7L	Fauna/PSA	1mm	Fine-medium olive brown sand with numerous shell fragments. No odour. Observed Fauna: Scaphopoda, Polychaeta. Munsel: 5Y 3/2	
76	TCC_GRAB_109	21:50	5L	Fauna/PSA	1mm	Fine sand with fines component. Dark grey/brown with muddy odour. Observed Fauna: Polychaeta. Munsel: 5Y 4/2	
Date: 13-Oct-2012 Weather: WX: Light Airs, 1.5m swell							
77	TCC_GRAB_43	20:00	10L	Fauna/PSA	1mm	Fine sand with fines component some shell fragments present. Dark olive grey with muddy organic odour. Observed Fauna: Mollusca including Bivalva, Polychaeta.Munsel: 5Y 3/2	
78	TCC_GRAB_42	20:30	10L	Fauna/PSA	1mm	Fine sand with fines component some shell fragments present. Dark grey with muddy organic odour. Observed Fauna: Mollusca including Bivalvia, Polychaeta. Munsel: 5Y 4/3	Possible piece of fossilised wood.
Date: 14-Oct-2012 Weather: WX:Light Airs, 1.5m swell							
79	TCC_GRAB_45	00:30	6L	Fauna/PSA	1mm	Muddy fine sand (high fines) with shell fragments and little odour. Dark brown grey. Observed fauna: Mollusca (Scaphopoda) Annelida, Actinaria. Munsel: 5Y 3/	
80	TCC_GRAB_46	01:50	10L	Fauna/PSA	1mm	Sand with high fines and some shell fragments, little odour. Dark brown grey. Observed fauna: Mollusca (Scaphopoda), Polychaeta. Munsel: 5Y 2.5/1	
Date: 15-Oct-2012 Weather: WX:NW F5, 2m swell							

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No:	9181	**Area:**	Teesside Cable Corridor	**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS
Date:	from: 22-Sep-12 to: 16-Oct-12	**Page:**	8 of 9	**Client:** Forewind Ltd			**Sieve Size:** 1mm **Equipment:** Mini Hamon Grab
Project:	Teesside Cable Corridor Benthic Survey						

Sample Number	Station Number	Time	Load	Retention	Sieving Comments	Sediment Description	Comments
81	TCC_GRAB_47	09:30	10L	Fauna/PSA	1mm	Fine muddy sand, no odour.Observed fauna: Crustacea (Amphipoda - red pigmented), Mollusca (Bivalvia, Scaphopoda), Cnideria (*Pennatula phosphorea*), Polychaeta, possible Ascidiacea. Munsel: 5Y 3/2	
82	TCC_GRAB_48	12:40	10L	Fauna/PSA	1mm	Fine muddy sand with shell fragments. Dark olive grey. Observed fauna: Polychaeta, Mollusca. Munsel: 5Y 3/2	
83	TCC_GRAB_49	14:11	9L	Fauna/PSA	1mm	Fine muddy sand with shell and shell fragments. Very dark brown. Observed fauna: Polychaeta. Munsel: 2.5Y 3/2	
84	TCC_GRAB_52	18:06	3L	NS	-	No Sample	Low Retention
85	TCC_GRAB_52	18:17	5L	Fauna/PSA	1mm	Fine muddy sand and shell fragments. dark olive grey. Observed fauna: Ophiuroidea, *Echinocardium* (juvenile), Polychaeta. Munsel: 5Y 3/2	
86	TCC_GRAB_53	19:34	2L	NS	-	No Sample	Low Retention
87	TCC_GRAB_53	19:45	0L	NS	-	No Sample	Low Retention
88	TCC_GRAB_53	19:52	4L	NS	-	No Sample	Low Retention
89	TCC_GRAB_53	20:05	6L	Fauna/PSA	1mm	Muddy sand, gravel, pebbles, cobbles and shell. Dark olive grey. Observed fauna Ophiuroidea. Munsel: 5Y 3/2	
90	TCC_GRAB_54	21:29	10L	Fauna/PSA	1mm	Muddy sand with shell fragments. Dark olive grey. Observed fauna: Ophiuroidea, Mollusca, Polychaeta. Munsel: 5Y 3/2	
91	TCC_GRAB_55	22:49	6L	Fauna/PSA	1mm	Fine muddy sand with shell fragments. Dark olive grey. Observed fauna: Ophiuroidea, Mollusca. Munsel: 5Y 3/2	
92	TCC_GRAB_56	23:51	6L	Fauna/PSA	1mm	Fine muddy sand with lots of shell and shell fragments. Dark olive grey. Oberved fauna: Polychaeta. Munsel: 5Y 3/2	

Date: 16-Oct-2012 Weather: WX: F4, 1.0-1.5m swell

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant			**Operator:** IS, HMc, HB, AH, ANN, BM, TR, KLS, JG, TC, KS
Date: from: 22-Sep-12 to: 16-Oct-12		**Page:** 9 of 9		**Client:** Forewind Ltd			**Sieve Size:** 1mm **Equipment:** Mini Hamon Grab
Project: Teesside Cable Corridor Benthic Survey							
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
93	TCC_GRAB_57	00:55	8L	Fauna/PSA	1mm	Sand with shell fragments. Dark olive brown. Observed fauna: Polychaeta. Munsel: 5Y 4/1	

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant		**Operator:** KS, AH, JG, TR, TC, KS	
Date: from: 18-Oct-2012 to: 19-Oct-2012		**Page:** 1 of 2		**Client:** Forewind Ltd		**Sieve Size:** N/A	
						Equipment: Day Grab	
Project: Teesside Cable Corridor Benthic Survey							
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
Date: 18-Oct-2012 WX: S3, <1m Swell							
1	TCC_CHEM_18A	07:33	45%	HC, PAH, Marine Sed. 1	-	Fine- coarse brown sand and shell fragments	BARCODE:2091779
2	TCC_CHEM_18B	07:48	70%	Marine Sed. 2, Spare Bag, Spare Glass	-	Fine- coarse brown sand and shell fragments	BARCODE:2091779
3	TCC_CHEM_27A	09:39	60%	HC, PAH, Marine Sed. 1	-	Fine brown silty-sand	BARCODE:2091780
4	TCC_CHEM_27B	09:52	30%	NS	-	No sample	Low Retention
5	TCC_CHEM_27B	09:59	30%	NS	-	No sample	Low Retention
6	TCC_CHEM_27B	10:09	10%	NS	-	No sample	Low Retention
7	TCC_CHEM_27B	10:24	70%	Marine Sed. 2, Spare Bag, Spare Glass	-	Fine brown silty-sand	BARCODE:2091780
8	TCC_CHEM_86	11:38	<10%	NS	-	No sample	Low Retention
9	TCC_CHEM_86	11:47	<10%	NS		No sample	Low Retention
10	TCC_CHEM_86A	13:58	40%	HC, PAH, Marine Sed. 1	-	Fine brown sand	BARCODE:2091781
11	TCC_CHEM_86B	14:14	50%	Marine Sed. 2, Spare Bag, Spare Glass	-	Fine, brown sand. Observed fauna: Bivalvia	BARCODE:2091781
12	TCC_CHEM_95A	15:38	60%	HC, PAH, Marine Sed. 1	-	Medium to fine brown sand with silt	BARCODE:2091782
13	TCC_CHEM_95B	15:55	50%	Marine Sed. 2, Spare Bag, Spare Glass	-	Medium to fine brown sand with silt	BARCODE:2091782
14	TCC_CHEM_102A	17:01	40%	HC, PAH, Marine Sed. 1	-	Medium to fine brown sand with silt	BARCODE:2091783
15	TCC_CHEM_102B	17:39	10%	NS	-	No sample	Low Retention
16	TCC_CHEM_102B	18:00	80%	Marine Sed. 2, Spare Bag, Spare Glass	-	Medium to fine brown sand with silt	BARCODE:2091783

APPENDIX A – FIELD SAMPLING LOGS

Teesside Cable Corridor

SEABED SAMPLING LOG SHEET (Deck)							QPRO-0755
Job No: 9181		**Area:** Teesside Cable Corridor		**Vessel:** Vigilant		**Operator:** KS, AH, JG, TR, TC, KS	
Date: from: 18-Oct-2012 to: 19-Oct-2012		**Page:** 2 of 2		**Client:** Forewind Ltd		**Sieve Size:** N/A	
						Equipment: Day Grab	
Project: Teesside Cable Corridor Benthic Survey							
Sample Number	**Station Number**	**Time**	**Load**	**Retention**	**Sieving Comments**	**Sediment Description**	**Comments**
17	TCC_CHEM_109A	19:48	40%	HC, PAH, Marine Sed. 1	-	Fine brown silty sand	BARCODE:2091784
18	TCC_CHEM_109B	20:01	70%	Marine Sed. 2, Spare Bag, Spare Glass	-	Fine brown silty sand	BARCODE:2091784
19	TCC_CHEM_114A	21:15	40%	HC, PAH, Marine Sed. 1	-	Medium to fine brown sand with silt	BARCODE:2091785
20	TCC_CHEM_114B	21:26	40%	Marine Sed. 2, Spare Bag, Spare Glass	-	Medium to fine brown sand with silt. Observed fauna: Polycheata	BARCODE:2091785
21	TCC_CHEM_54A	22:35	10%	NS	-	No sample	Low Retention
22	TCC_CHEM_54A	22:43	40%	HC, PAH, Marine Sed. 1	-	Fine silty brown sand	BARCODE:2091786
23	TCC_CHEM_54B	22:55	40%	Marine Sed. 2, Spare Bag, Spare Glass	-	Fine silty brown sand. Observed fauna:*Astrospecten irregularis*	BARCODE:2091786
Date: 19-Oct-12 WX: S3, <1m Swell							
24	TCC_CHEM_48A	00:56	40%	HC, PAH, Marine Sed. 1	-	Fine silty brown sand	BARCODE:2091787
25	TCC_CHEM_48B	01:11	40%	Marine Sed. 2, Spare Bag, Spare Glass	-	Fine silty brown sand	BARCODE:2091787
26	TCC_CHEM_40A	02:59	50%	HC, PAH, Marine Sed. 1	-	Fine silty brown sand. Observed fauna: Polychaeta	BARCODE:2091788
27	TCC_CHEM_40B	03:13	70%	Marine Sed. 2, Spare Bag, Spare Glass	-	Fine silty brown sand. Observed fauna: Polychaeta tubes	BARCODE:2091788

APPENDIX B – SAMPLING AND SEABED PHOTOGRAPHS

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 332 **E:** 484396 **N:** 6103117 **Depth:** 26m

Fix: 341 **E:** 484398 **N:** 6103116 **Depth:** 26m

Station: TB_01
Sediment Description:
Fix332: Fine rippled sand with shell fragments

Fix341: Fine rippled sand with shell fragments

Fauna Description:
Fix332: No visible fauna

Fix341: Echinodermata - *Ophiura* sp.

Fix: 50 **E:** 484392 **N:** 6103135 **Depth:** 26m

Fix: 50 **E:** 484392 **N:** 6103135 **Retention:** MF

Station: TB_01
Sediment Description:
Grab: Fine sand with shell fragments

Sieve: Small to medium shells and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta), Mollusca - Bivalvia, Echinodermata - *Echinocardium* sp., Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 500 **E:** 481896 **N:** 6096482 **Depth:** 25m

Fix: 506 **E:** 481906 **N:** 6096479 **Depth:** 25m

Station: TB_02
Sediment Description:
Fix500: Fine rippled sand with shell fragments

Fix506: Fine rippled sand with shell fragments

Fauna Description:
Fix500: Arthropoda (Crustacea) – Paguridae, Mollusca - Bivalvia

Fix506: No visible fauna

Fix: 64 **E:** 481904 **N:** 6096500 **Depth:** 25m

Fix: 64 **E:** 481904 **N:** 6096500 **Retention:** MF

Station: TB_02
Sediment Description:
Grab: Fine sand with medium shells and shell fragments

Sieve: Small to medium shells and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Echinocardium* sp., Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 473 **E:** 489729 **N:** 6093212 **Depth:** 23m

Fix: 481 **E:** 489738 **N:** 6093223 **Depth:** 23m

Station: TB_03
Sediment Description:
Fix473: Fine rippled sand with shell fragments

Fix481: Fine rippled sand with shell fragments

Fauna Description:
Fix473: No visible fauna

Fix481: Mollusca - Bivalvia

Fix: 62 **E:** 489764 **N:** 6093220 **Depth:** 23m

Fix: 62 **E:** 489764 **N:** 6093220 **Retention:** MF

Station: TB_03
Sediment Description:
Grab: Fine sand with shell fragments

Sieve: Small to medium shells and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - Ophiuroidea, Other - Chordata - Ammodytidae

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 450 **E:** 501121 **N:** 6094739 **Depth:** 23m

Fix: 457 **E:** 501140 **N:** 6094785 **Depth:** 23m

Station: TB_04
Sediment Description:
Fix450: Fine rippled sand with shell fragments

Fix457: Fine rippled sand with shell fragments

Fauna Description:
Fix450: Annelida (Polychaeta) - Polychaete tubes

Fix457: No visible fauna

Fix: 60 **E:** 501102 **N:** 6094758 **Depth:** 23m

Fix: 60 **E:** 501102 **N:** 6094758 **Retention:** MF

Station: TB_04
Sediment Description:
Grab: Fine sand with shell fragments

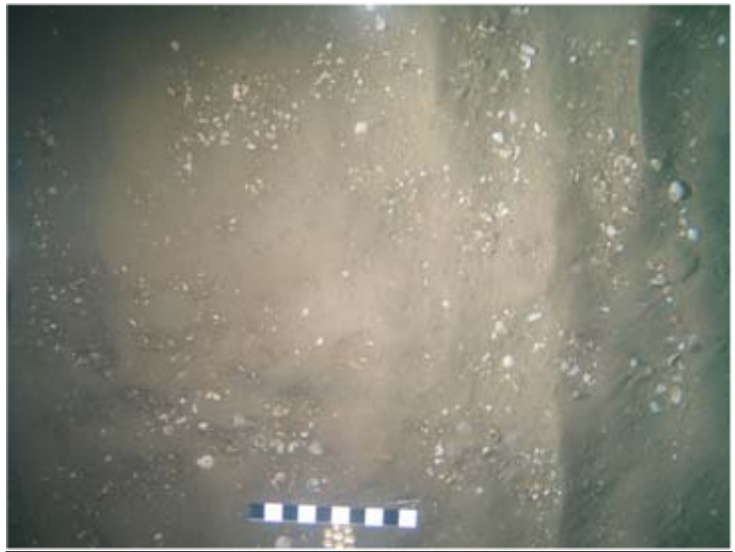
Sieve: Small to medium shells and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

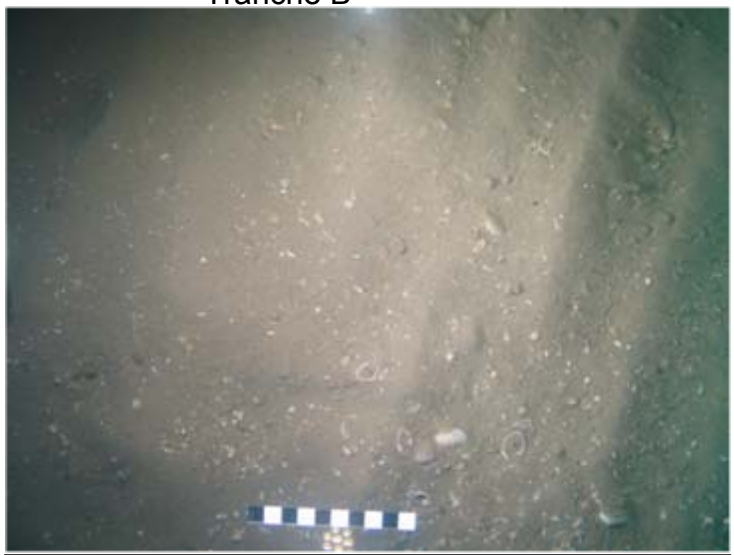
Sieve: Annelida (Polychaeta) - Polychaeta, Polychaete tubes, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 343 **E:** 483531 **N:** 6101859 **Depth:** 26m



Fix: 350 **E:** 483487 **N:** 6101839 **Depth:** 26m

Station: TB_05
Sediment Description:
Fix343: Fine rippled sand with shell fragments

Fix350: Fine rippled sand with shell fragments

Fauna Description:
Fix343: Mollusca - Bivalvia

Fix350: Annelida (Polychaeta) - Polychaete tubes

Fix: 49 **E:** 483485 **N:** 6101836 **Depth:** 25m

Fix: 49 **E:** 483485 **N:** 6101836 **Retention:** MF

Station: TB_05
Sediment Description:
Grab: Fine sand with shell fragments

Sieve: Small shells and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 485 **E:** 486752 **N:** 6094305 **Depth:** 26m

Fix: 496 **E:** 486758 **N:** 6094278 **Depth:** 24m

Station: TB_06
Sediment Description:
Fix485: Fine rippled sand with shell fragments

Fix496: Fine rippled sand with shell fragments

Fauna Description:
Fix485: No visible fauna

Fix496: No visible fauna

Fix: 63 **E:** 486761 **N:** 6094289 **Depth:** 24m

Fix: 63 **E:** 486761 **N:** 6094289 **Retention:** MF

Station: TB_06
Sediment Description:
Grab: Fine sand with shell fragments

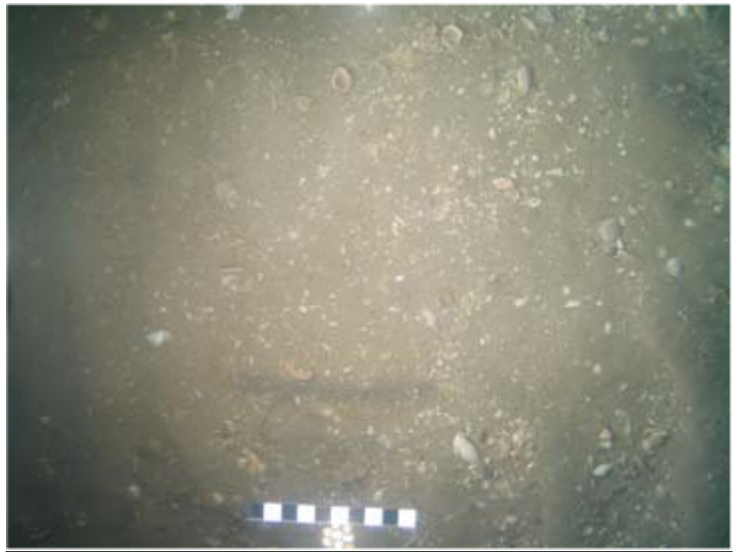
Sieve: Small to medium shells and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 507 **E:** 480280 **N:** 6092332 **Depth:** 24m

Fix: 511 **E:** 480308 **N:** 6092351 **Depth:** 24m

Station: TB_07
Sediment Description:
Fix507: Fine rippled sand with shell fragments

Fix511: Fine rippled sand with shell fragments

Fauna Description:
Fix507: Annelida (Polychaeta) - Polychaete tubes, Mollusca - Bivalvia

Fix511: Annelida (Polychaeta) - Polychaete tubes

Fix: 515 **E:** 480320 **N:** 6092378 **Depth:** 24m

Fix: 67 **E:** 480296 **N:** 6092357 **Depth:** 24

Station: TB_07
Sediment Description:
Fix515: Fine rippled sand with shell fragments

Grab: Fine sand with shell fragments

Fauna Description:
Fix515: Annelida (Polychaeta) - Polychaete tubes

Grab: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 351 **E:** 489466 **N:** 6105954 **Depth:** 25m

Fix: 355 **E:** 489410 **N:** 6105910 **Depth:** 26m

Station: TB_08
Sediment Description:
Fix351: Fine rippled sand with shell fragments

Fix355: Fine rippled sand with shell fragments

Fauna Description:
Fix351: Annelida (Polychaeta) - Polychaete tubes

Fix355: Arthropoda (Crustacea) - Paguridae

Fix: 54 **E:** 489382 **N:** 6105967 **Depth:** 25m

Fix: 54 **E:** 489382 **N:** 6105967 **Retention:** MF

Station: TB_08
Sediment Description:
Grab: Fine sand with shell fragments

Sieve: Small to medium shells and shell fragments and occasional gravel

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes, Other - Chordata - Ammodytidae

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 459 **E:** 497176 **N:** 6092455 **Depth:** 25m

Fix: 463 **E:** 497139 **N:** 6092462 **Depth:** 25m

Station: TB_09
Sediment Description:
Fix459: Fine rippled sand with occasional shell fragments

Fix463: Fine rippled sand with occasional shell fragments

Fauna Description:
Fix459: Annelida (Polychaeta) - Polychaete tubes

Fix463: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Ophiura* sp.

Fix: 466* **E:** 497127 **N:** 6092477 **Depth:** 24m

Fix: 61 **E:** 497157 **N:** 6092494 **Depth:** 25

Station: TB_09
Sediment Description:
Fix466*: Fine rippled sand with occasional shell fragments

Grab: Fine sand with shell fragments

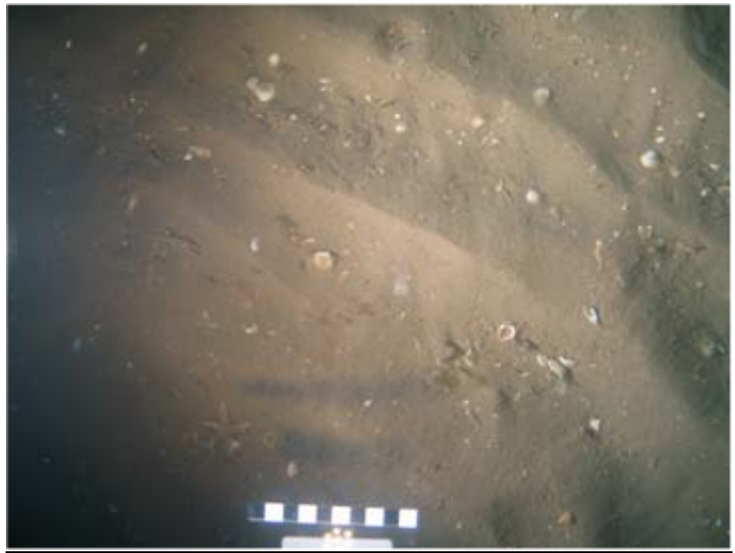
Fauna Description:
Fix466*: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Paguridae, Echinodermata - *Astropecten irregularis*, Other - Cnidaria - *Hydractinia echinata*

Grab: Annelida (Polychaeta) - Polychaete tubes

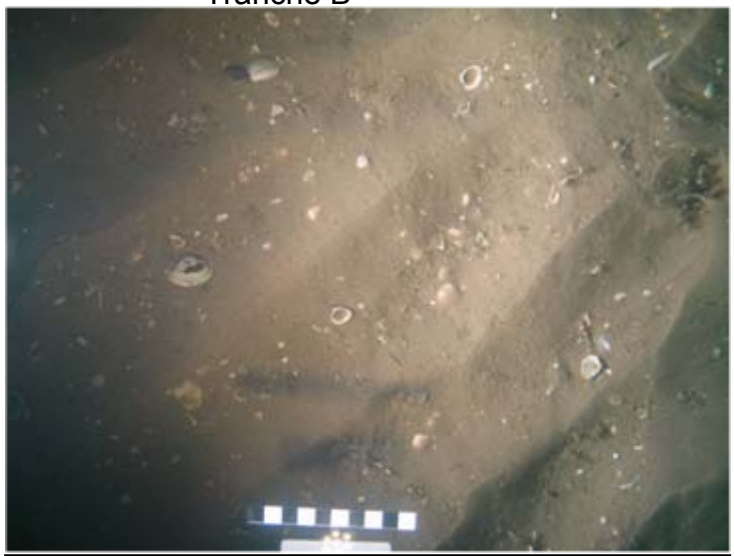
* No sieve picture taken at the time of sampling

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 61 **E:** 446838 **N:** 6098705 **Depth:** 29m



Fix: 69 **E:** 446882 **N:** 6098672 **Depth:** 29m

Station: TB_10
Sediment Description:
Fix61: Fine rippled sand with shell fragments

Fix69: Fine rippled sand with shell fragments

Fauna Description:
Fix61: Annelida (Polychaeta) - Polychaete tubes, Mollusca - Bivalvia, Echinodermata - *Asterias rubens*

Fix69: Annelida (Polychaeta) - Polychaete tubes

Fix: 1 **E:** 446833 **N:** 6098661 **Depth:** 29m

Fix: 1 **E:** 446833 **N:** 6098661 **Retention:** MF

Station: TB_10
Sediment Description:
Grab: Fine sand with shell fragments

Sieve: Small to medium shells and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 560 **E:** 455525 **N:** 6093401 **Depth:** 29m

Fix: 565 **E:** 455541 **N:** 6093403 **Depth:** 29m

Station: TB_11
Sediment Description:
Fix560: Slightly rippled fine to medium sand with occasional shell fragments

Fix565: Slightly rippled fine to medium sand with occasional shell fragments

Fauna Description:
Fix560: Mollusca - Bivalvia

Fix565: Mollusca - Solenidae

Fix: 77 **E:** 455552 **N:** 6093332 **Depth:** 29m

Fix: 77 **E:** 455552 **N:** 6093332 **Retention:** Fauna/PSA

Station: TB_11
Sediment Description:
Grab: Fine to medium compact sand. Shell fragments, some anoxic sediment and odour

Sieve: Shell hash

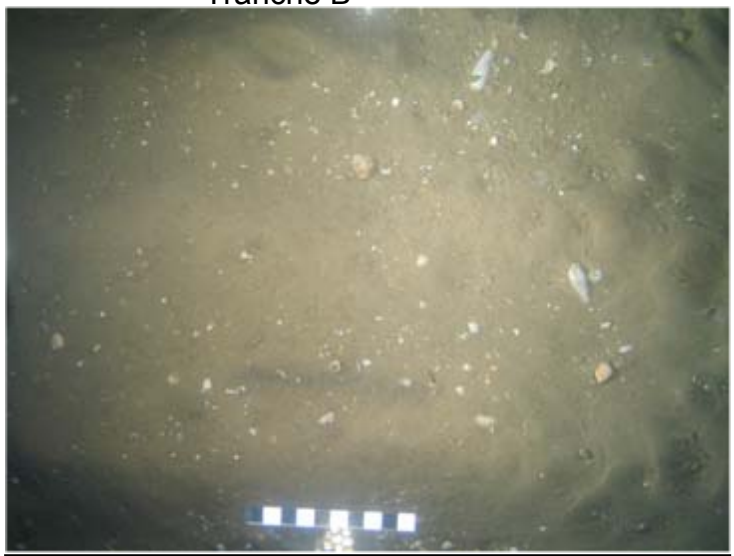
Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Arthropoda (Crustacea) - *Corystes cassivelaunus* juv., Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 528 **E:** 472425 **N:** 6097922 **Depth:** 27m



Fix: 535 **E:** 472463 **N:** 6097941 **Depth:** 27m

Station: TB_12
Sediment Description:
Fix528: Slightly rippled fine to medium sand with frequent shell fragments

Fix535: Slightly rippled fine to medium sand with occasional shell fragments

Fauna Description:
Fix528: Echinodermata - *Asterias rubens*

Fix535: No visible fauna

Fix: 70 **E:** 472450 **N:** 6097971 **Depth:** 27m

Fix: 70 **E:** 472450 **N:** 6097971 **Retention:** Fauna/PSA

Station: TB_12
Sediment Description:
Grab: Fine sand with shell fragments

Sieve: Whole shells and shell hash

Fauna Description:
Grab: Annelida (Polychaeta) - Sabellidae

Sieve: No visible fauna

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 325 **E:** 481934 **N:** 6110308 **Depth:** 26m

Fix: 329 **E:** 481921 **N:** 6110344 **Depth:** 26m

Station: TB_13
Sediment Description:
Fix325: Slightly rippled fine to medium sand with occasional shell fragments

Fix329: Slightly rippled fine to medium sand with occasional shell fragments

Fauna Description:
Fix325: Arthropoda (Crustacea) - *Pagurus* sp., Bioturbation - faunal tracks

Fix329: No visible fauna

Fix: 46 **E:** 481924 **N:** 6110333 **Depth:** 26m

Fix: 46 **E:** 481924 **N:** 6110333 **Retention:** Fauna

Station: TB_13
Sediment Description:
Grab: Fine sand with shell fragments

Sieve: Shell hash

Fauna Description:
Grab: No visible fauna

Sieve: Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 390 **E:** 493198 **N:** 6110101 **Depth:** 29m

Fix: 394 **E:** 493188 **N:** 6110134 **Depth:** 29m

Station: TB_14
Sediment Description:
Fix390: Slightly rippled fine to medium sand with occasional shell fragments

Fix394: Slightly rippled fine to medium sand with occasional shell fragments

Fauna Description:
Fix390: No visible fauna

Fix394: Arthropoda (Crustacea) - Brachyura

Fix: 51 **E:** 493201 **N:** 6110128 **Depth:** 29m

Fix: 51 **E:** 493201 **N:** 6110128 **Retention:** Fauna/PSA

Station: TB_14
Sediment Description:
Grab: Fine sand with shell fragments

Sieve: Shell hash

Fauna Description:
Grab: Compact fine sand with shell fragments

Sieve: Shell hash

Fauna Description:
Grab: Annelida (Polychaeta) - Sabellidae, Echinodermata - *Echinocardium* sp.

Sieve: Annelida (Polychaeta) - Sabellidae, *Nephtys* sp., Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 412 **E:** 503379 **N:** 6110820 **Depth:** 27m

Fix: 415 **E:** 503381 **N:** 6110828 **Depth:** 27m

Station: TB_15
Sediment Description:
Fix412: Slightly rippled fine to medium sand with occasional shell fragments

Fix415: Slightly rippled fine to medium sand with occasional shell fragments

Fauna Description:
Fix412: Arthropoda (Crustacea) - *Pagurus* sp.

Fix415: Echinodermata - *Astropecten irregularis*, Other - Chordata - *Buglossidium luteum*

Fix: 56 **E:** 503397 **N:** 6110830 **Depth:** 27m

Fix: 56 **E:** 503397 **N:** 6110830 **Retention:** Fauna/PSA

Station: TB_15
Sediment Description:
Grab: Fine sand with shell fragments

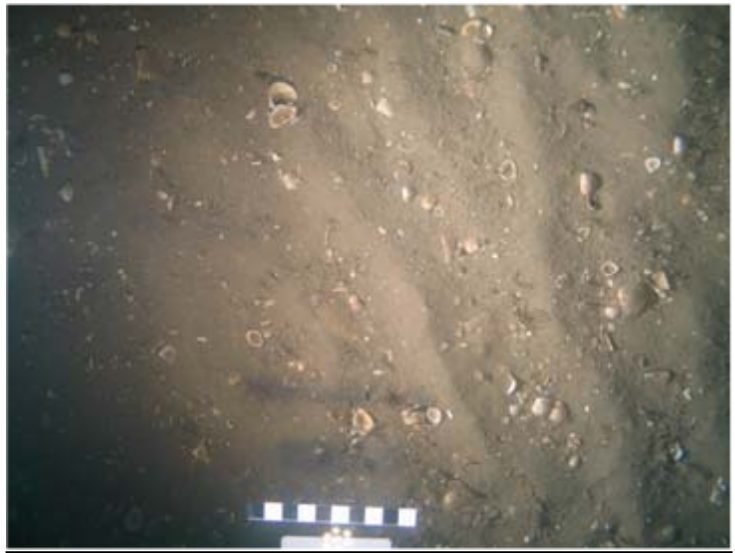
Sieve: Shell hash

Fauna Description:
Grab: No visible fauna

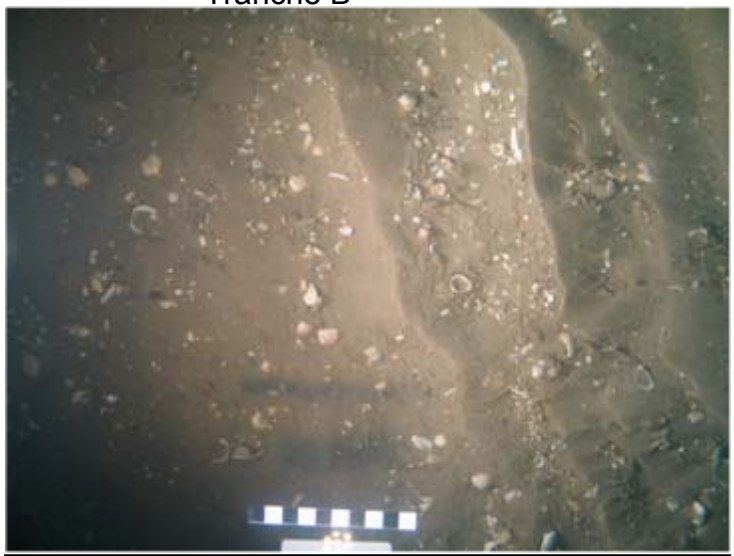
Sieve: Annelida (Polychaeta), Mollusca - Bivalvia, Other - Cnidaria - Actiniaria

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 54 **E:** 445699 **N:** 6097632 **Depth:** 29m



Fix: 58 **E:** 445700 **N:** 6097628 **Depth:** 29m

Station: TB_16
Sediment Description:
Fix54: Rippled fine to medium sand with frequent shell fragments

Fix58: Rippled fine to medium sand with frequent shell fragments

Fauna Description:
Fix54: No visible fauna

Fix58: No visible fauna

Fix: 3 **E:** 445691 **N:** 6097608 **Depth:** 29m

Fix: 3 **E:** 445691 **N:** 6097608 **Retention:** Fauna/PSA

Station: TB_16
Sediment Description:
Grab: Fine sand with shells and shell fragments

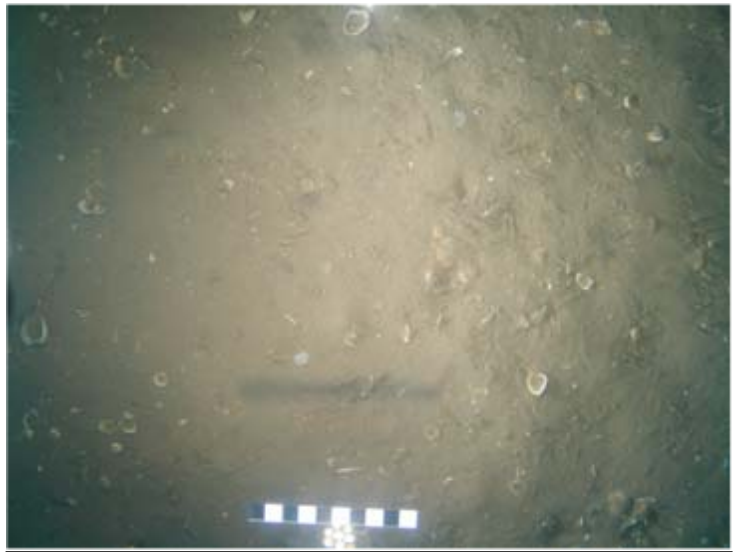
Sieve: Shell hash

Fauna Description:
Grab: Annelida (Polychaeta) - Sabellidae, Echinodermata - *Echinocardium* sp.

Sieve: Echinodermata - *Echinocardium*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 549 **E:** 453439 **N:** 6093396 **Depth:** 28m

Fix: 555 **E:** 453439 **N:** 6093388 **Depth:** 29m

Station: TB_17
Sediment Description:
Fix549: Slightly rippled fine to medium sand with frequent shell fragments

Fix555: Slightly rippled fine to medium sand with occasional shell fragments

Fauna Description:
Fix549: No visible fauna

Fix555: No visible fauna

Fix: 78 **E:** 453445 **N:** 6093358 **Depth:** 28m

Fix: 78 **E:** 453445 **N:** 6093358 **Retention:** Fauna/PSA

Station: TB_17
Sediment Description:
Grab: Fine- medium compact sand, with some anoxic sediment and lots of shell fragments

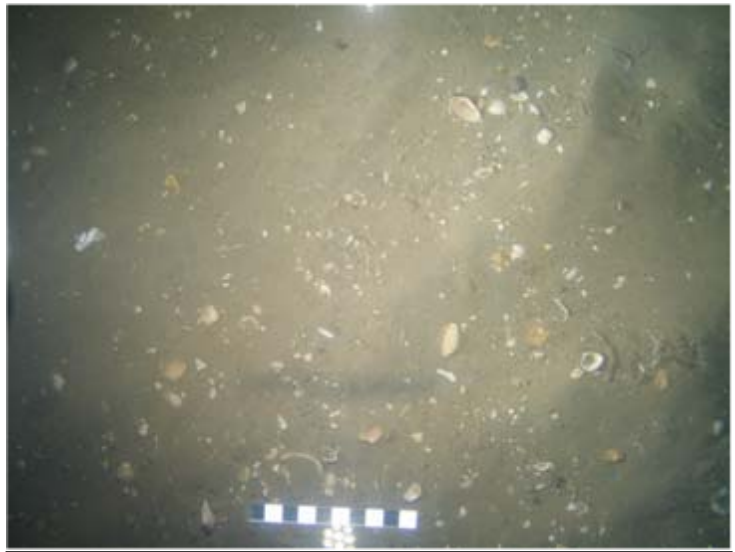
Sieve: Shell fragments

Fauna Description:
Grab: Annelida (Polychaeta), Echinodermata - *Echinocardium* sp.

Sieve: Annelida (Polychaeta), Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 517 **E:** 476669 **N:** 6098970 **Depth:** 28m

Fix: 523 **E:** 476692 **N:** 6099016 **Depth:** 28m

Station: TB_18
Sediment Description:
Fix517: Slightly rippled fine to medium sand with frequent shell fragments

Fix523: Slightly rippled fine to medium sand with frequent shell fragments

Fauna Description:
Fix517: No visible fauna

Fix523: Bioturbation - burrows

Fix: 69 **E:** 476682 **N:** 6098993 **Depth:** 28m

Fix: 69 **E:** 476682 **N:** 6098993 **Retention:** Fauna

Station: TB_18
Sediment Description:
Grab: Fine to medium sand with shell fragments

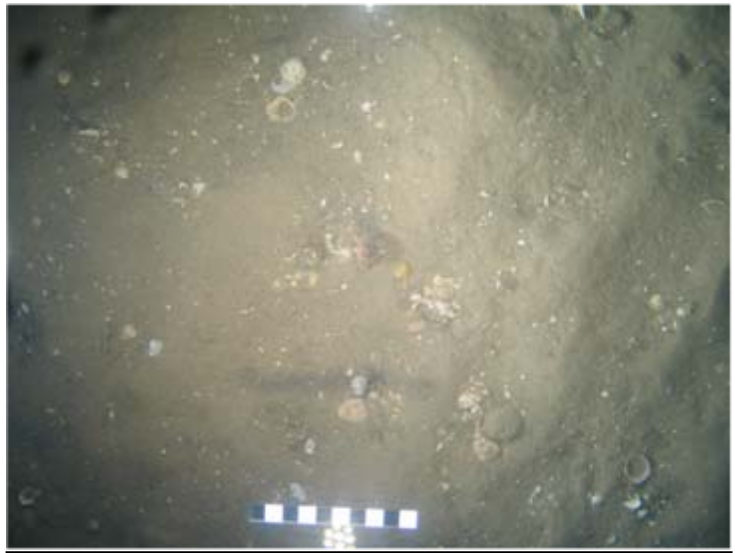
Sieve: Shell fragments

Fauna Description:
Grab: Echinodermata - *Echinocardium* sp.

Sieve: Annelida (Polychaeta), Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 419 **E:** 500663 **N:** 6109655 **Depth:** 26m

Fix: 423 **E:** 500672 **N:** 6109631 **Depth:** 26m

Station: TB_19
Sediment Description:
Fix419: Slightly rippled fine to medium sand with occasional shell fragments

Fix423: Slightly rippled fine to medium sand with occasional shell fragments

Fauna Description:
Fix419: Arthropoda (Crustacea) - Brachyura

Fix423: Bioturbation - faunal tracks

Fix: 55 **E:** 500632 **N:** 6109643 **Depth:** 26m

Fix: 55 **E:** 500632 **N:** 6109643 **Retention:** Fauna/PSA

Station: TB_19
Sediment Description:
Grab: Compact fine sand with lots of shell fragments

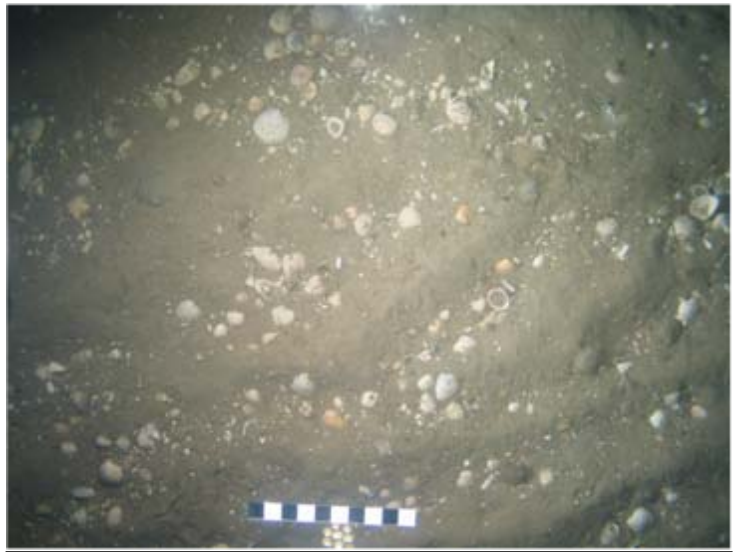
Sieve: Shell hash

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Mollusca - Solenidae

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 312 **E:** 478595 **N:** 6104437 **Depth:** 26m

Fix: 313 **E:** 478645 **N:** 6104430 **Depth:** 26m

Station: TB_20
Sediment Description:
Fix312: Rippled fine to medium sand with frequent shell fragments

Fix313: Slightly rippled fine to medium sand with occasional shell fragments

Fauna Description:
Fix312: Bioturbation - burrows

Fix313: Echinodermata – Ophiuroidea, possible *Ophiura* sp.

Fix: 44 **E:** 478647 **N:** 6104416 **Depth:** 26m

Fix: 44 **E:** 478647 **N:** 6104416 **Retention:** Fauna/PSA

Station: TB_20
Sediment Description:
Grab: Fine sand with shells and shell fragments

Sieve: Shell fragments

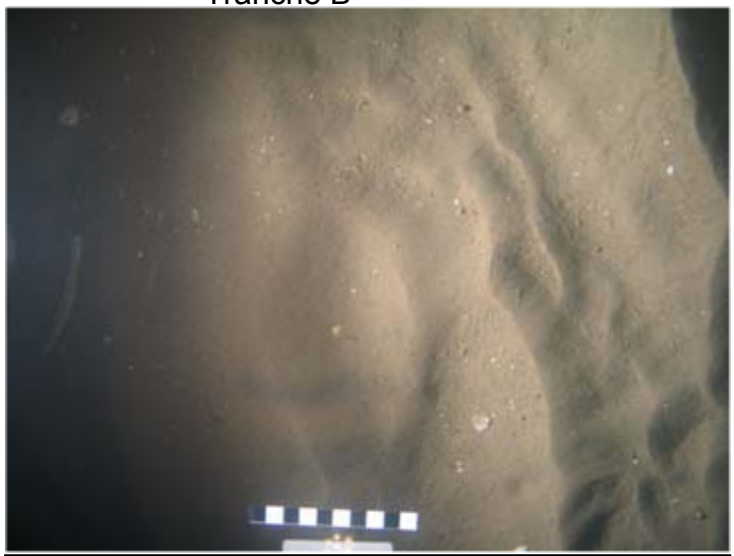
Fauna Description:
Grab: Mollusca - Bivalvia

Sieve: Mollusca - Bivalvia

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 4 **E:** 433828 **N:** 6104900 **Depth:** 29m



Fix: 6 **E:** 433799 **N:** 6104905 **Depth:** 29m

Station: TB_21
Sediment Description:
Fix4: Fine to medium rippled sand with shell fragments

Fix6: Fine to medium rippled sand with shell fragments

Fauna Description:
Fix4: No visible fauna

Fix6: Mollusca - Solenidae

Fix: 9 **E:** 433786 **N:** 6104928 **Depth:** 29m

Fix: 9 **E:** 433786 **N:** 6104928 **Retention:** MF

Station: TB_21
Sediment Description:
Grab: Fine sand

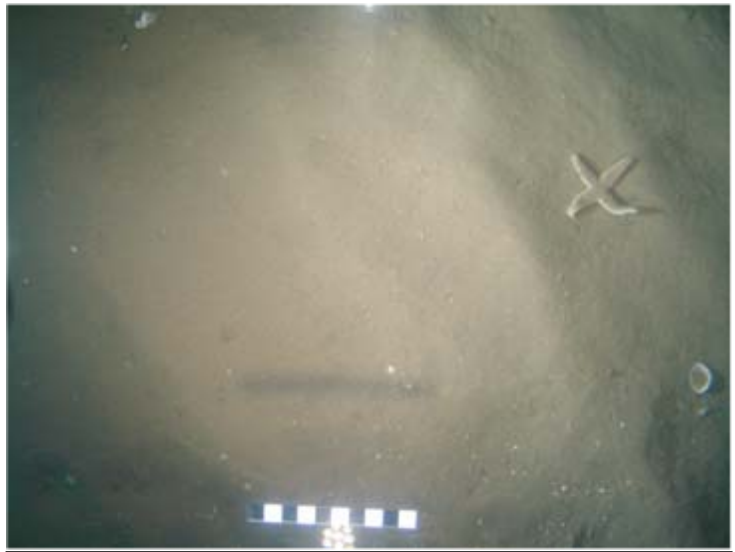
Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Mollusca - Bivalvia

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 569 **E:** 457196 **N:** 6096147 **Depth:** 26m

Fix: 578 **E:** 457206 **N:** 6096159 **Depth:** 27m

Station: TB_22
Sediment Description:
Fix569: Fine to medium rippled sand with shell fragments

Fix578: Fine to medium sand with shell fragments

Fauna Description:
Fix569: Echinodermata - *Asterias rubens*

Fix578: Echinodermata

Fix: 76 **E:** 457218 **N:** 6096101 **Depth:** 27m

Fix: 76 **E:** 457218 **N:** 6096101 **Retention:** MF

Station: TB_22
Sediment Description:
Grab: Fine to medium sand with shell fragments

Sieve: Coarse sand and shell fragments

Fauna Description:
Grab: Mollusca - Bivalvia

Sieve: Anneilda (Polychaeta) - Polychaete tubes, Mollusca - Bivalvia, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 439 **E:** 497567 **N:** 6099569 **Depth:** 27m

Fix: 445 **E:** 497551 **N:** 6099586 **Depth:** 27m

Station: TB_23
Sediment Description:
Fix439: Fine to medium sand with shell fragments

Fix445: Fine to medium sand with shell fragments

Fauna Description:
Fix439: Anneilda (Polychaeta) - Polychaete tubes, Other – Chordata - *Eutrigla gurnardus*

Fix445: Anthopoda (Crustacea) - Paguridae, Portunidae

Fix: 58 **E:** 497527 **N:** 6099569 **Depth:** 28m

Fix: 58 **E:** 497527 **N:** 6099569 **Retention:** MF

Station: TB_23
Sediment Description:
Grab: Fine sand with occasional shell fragments

Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes, Mollusca - Soleidae, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 398 **E:** 498735 **N:** 6112491 **Depth:** 28m

Fix: 404 **E:** 498730 **N:** 6112500 **Depth:** 28m

Station: TB_24
Sediment Description:
Fix398: Fine to medium sand with shell fragments and occasional gravel

Fix404: Fine to medium sand with shell fragments

Fauna Description:
Fix398: Annelida (Polychaeta) - Polychaete tubes

Fix404: Echinodermata - *Asterias rubens*

Fix: 57 **E:** 498758 **N:** 6112491 **Depth:** 28m

Fix: 57 **E:** 498758 **N:** 6112491 **Retention:** MF

Station: TB_24
Sediment Description:
Grab: Fine sand with shell fragments

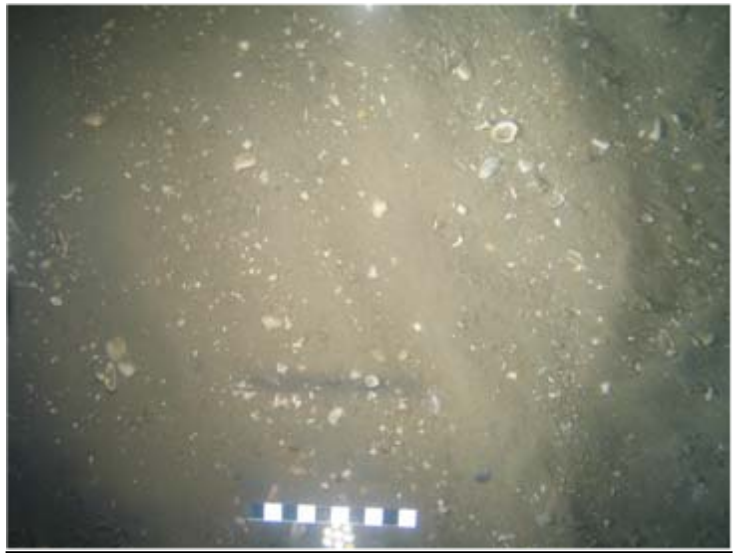
Sieve: Shell fragments and fine gravel

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 539 **E:** 470964 **N:** 6096838 **Depth:** 28m

Fix: 542 **E:** 470958 **N:** 6096853 **Depth:** 28m

Station: TB_25
Sediment Description:
Fix539: Fine to medium sand with shell fragments

Fix542: Fine to medium sand with shell fragments

Fauna Description:
Fix539: No visible fauna

Fix542: Arthropoda (Crustacea) - Paguridae

Fix: 71 **E:** 470929 **N:** 6096847 **Depth:** 28m

Fix: 71 **E:** 470929 **N:** 6096847 **Retention:** MF

Station: TB_25
Sediment Description:
Grab: Fine to medium sand with shell fragments

Sieve: Shell fragments

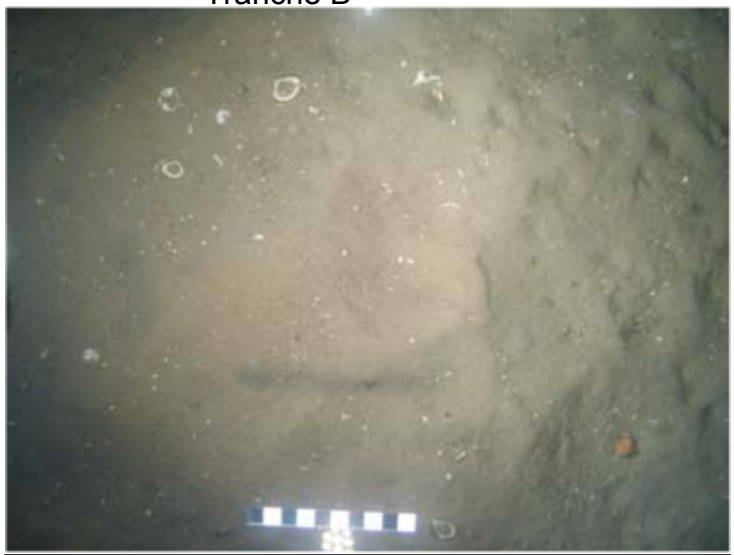
Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: No visible fauna

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 591 **E:** 459666 **N:** 6096873 **Depth:** 29m



Fix: 593 **E:** 459672 **N:** 6096876 **Depth:** 29m

Station: TB_26
Sediment Description:
Fix591: Fine to medium sand with shell fragments

Fix593: Fine to medium sand with shell fragments

Fauna Description:
Fix591: Echinodermata - *Asterias rubens*

Fix593: Other - Porifera

Fix: 72 **E:** 459673 **N:** 6096887 **Depth:** 29m

Fix: 72 **E:** 459673 **N:** 6096887 **Retention:** MF

Station: TB_26
Sediment Description:
Grab: Fine to medium sand with shell fragments

Sieve: Gravel and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 367 **E:** 490607 **N:** 6106563 **Depth:** 28m

Fix: 370 **E:** 490604 **N:** 6106568 **Depth:** 28m

Station: TB_27
Sediment Description:
Fix367: Mixed fine to coarse sand, with shell fragment and gravel

Fix370: Mixed fine to medium sand with shell fragment

Fauna Description:
Fix367: Annelida (Polychaeta) - Polychaete tubes, Mollusca - Bivalvia

Fix370: Annelida (Polychaeta) - Polychaete tubes

Fix: 53 **E:** 490563 **N:** 6106562 **Depth:** 28m

Fix: 53 **E:** 490563 **N:** 6106562 **Retention:** MF

Station: TB_27
Sediment Description:
Grab: Fine sand with shell fragments

Sieve: Fine gravel and shell fragments

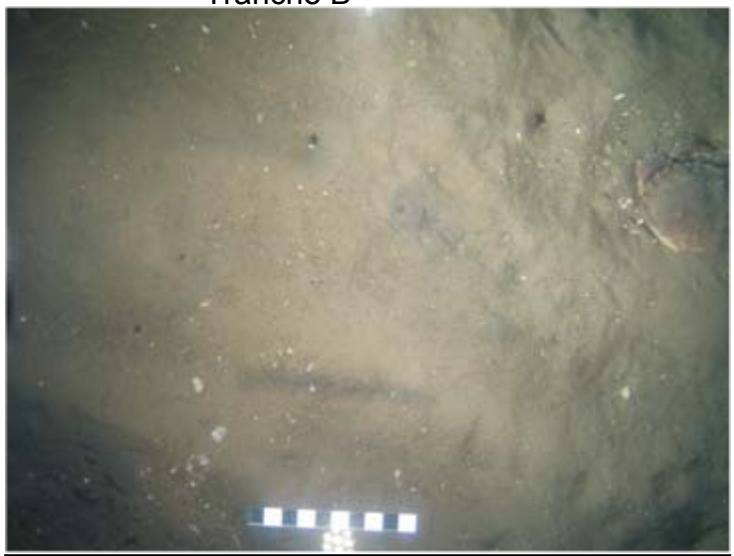
Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 583 **E:** 459152 **N:** 6097129 **Depth:** 29m



Fix: 584 **E:** 459166 **N:** 6097142 **Depth:** 29m

Station: TB_28
Sediment Description:
Fix583: Mixed fine to coarse sand, with shell fragment, gravel and cobbles

Fix584: Mixed fine to coarse sand, with shell fragment and cobbles

Fauna Description:
Fix583: Mollusca - Bivalvia

Fix584: Arthropoda (Crustacea) - *Cancer pagurus*

Fix: 75 **E:** 459142 **N:** 6097093 **Depth:** 29m

Fix: 75 **E:** 459142 **N:** 6097093 **Retention:** MF

Station: TB_28
Sediment Description:
Grab: Fine to medium sand with shell fragments

Sieve: Fine gravel and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes, Mollusca – Soleidae, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 382 **E:** 489706 **N:** 6109600 **Depth:** 28m

Fix: 386 **E:** 489690 **N:** 6109646 **Depth:** 28m

Station: TB_29
Sediment Description:
Fix382: Fine to medium sand with shell fragments

Fix386: Fine to medium sand with shell fragments

Fauna Description:
Fix382: Annelida (Polychaeta) - Polychaete tubes

Fix386: Anneilda (Polychaeta) - Polychaete tubes, Other - Chordata - Teleostei

Fix: 52 **E:** 489664 **N:** 6109621 **Depth:** 28m

Fix: 52 **E:** 489664 **N:** 6109621 **Retention:** MF

Station: TB_29
Sediment Description:
Grab: Fine sand with shell fragments

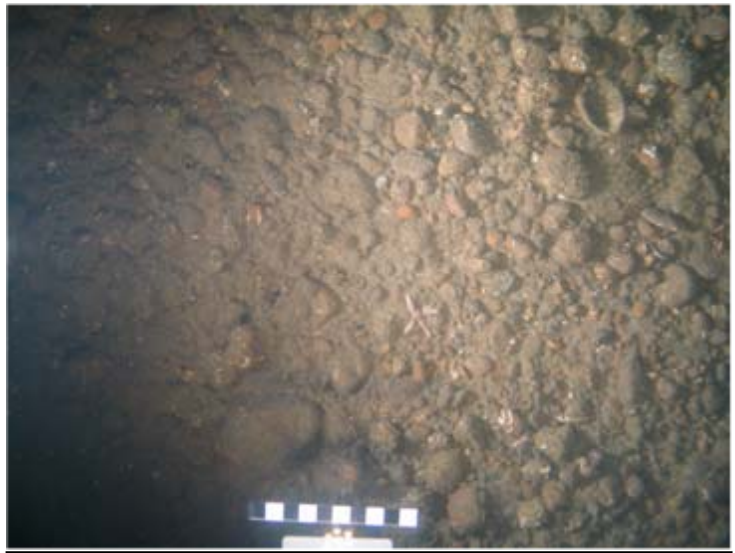
Sieve: Gravel and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) Polychaete tubes, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 43 **E:** 438985 **N:** 6099877 **Depth:** 29m

Fix: 48 **E:** 438956 **N:** 6099895 **Depth:** 29m

Station: TB_30
Sediment Description:
Fix43: Mix of fine to coarse sand with shell fragments, gravel, pebbles and cobbles

Fix48: Mix of fine to coarse sand with shell fragments, gravel, pebbles and cobbles

Fauna Description:
Fix43: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Bivalvia, Echinodermata - *Asterias rubens*

Fix48: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca, Echinodermata - *Asterias rubens*

Fix: 5 **E:** 438977 **N:** 6099880 **Depth:** 29m

Fix: 5 **E:** 438977 **N:** 6099880 **Retention:** MF

Station: TB_30
Sediment Description:
Grab: Fine sand with gravel, pebbles, cobbles and shell fragments

Sieve: Gravel, pebbles, cobbles and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - *Spirobranchus* sp.

Sieve: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Bivalvia

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 598 **E:** 463043 **N:** 6095427 **Depth:** 27m

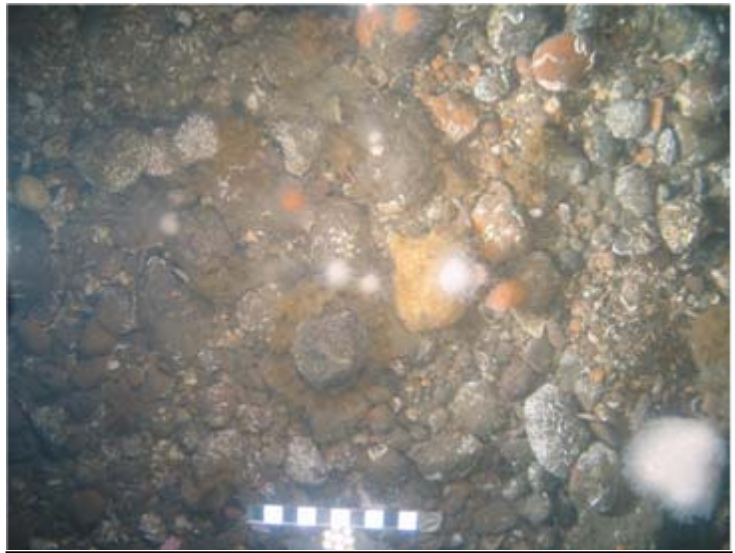
Fix: 603 **E:** 463041 **N:** 6095413 **Depth:** 27m

Station: TB_31
Sediment Description:
Fix598: Gravel, cobbles and small boulders with interstitial coarse sand

Fix603: Gravel, cobbles and small boulders with interstitial coarse sand

Fauna Description:
Fix598: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Asterias rubens*, Other – Bryozoa - *Bugula* sp., Cnidaria - *Alcyonium* sp., Chordata - Gobiidae.

Fix603: Annelida (Polychaeta) - *Spirobranchus* sp., Other - Bryozoa - *Bugula* sp.



Fix: 608 **E:** 463056 **N:** 6095462 **Depth:** 27m

Fix: 611 **E:** 463072 **N:** 6095497 **Depth:** 27m

Station: TB_31
Sediment Description:
Fix608: Gravel, cobbles and small boulders with interstitial coarse sand

Fix611: Gravel, cobbles and small boulders with interstitial coarse sand

Fauna Description:
Fix608: Annelida (Polychaeta) - *Spirobranchus* sp., Other - Bryozoa - *Bugula* sp., Cnidaria - *Alcyonium* sp., - Urochordata - Ascidacea

Fix611: Annelida (Polychaeta) - *Spirobranchus* sp., Other - Bryozoa - *Bugula* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 426 **E:** 494701 **N:** 6102931 **Depth:** 28m

Fix: 433 **E:** 494767 **N:** 6102955 **Depth:** 29m

Station: TB_32
Sediment Description:
Fix426: Slightly rippled fine sand with occasional shell fragments

Fix433: Gravel with interstitial sand

Fauna Description:
Fix426: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Astropecten irregularis*

Fix433: Annelida (Polychaeta) - *Spirobranchus* sp.

Fix: 58 **E:** 494708 **N:** 6102928 **Depth:** 29m

Fix: 58 **E:** 494708 **N:** 6102928 **Retention:** Fauna/PSA

Station: TB_32
Sediment Description:
Grab: Fine sand with occasional shell fragments

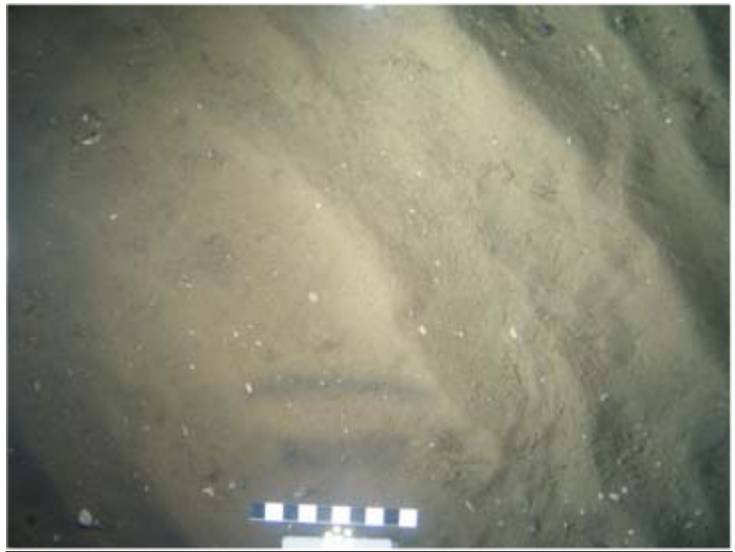
Sieve: Shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

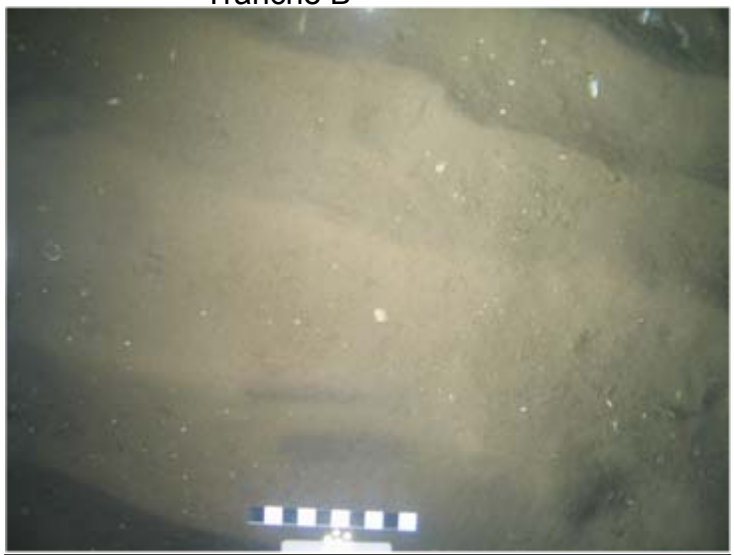
Sieve: Annelida (Polychaeta) – Polychaeta, Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 73 **E:** 442685 **N:** 6106580 **Depth:** 34m



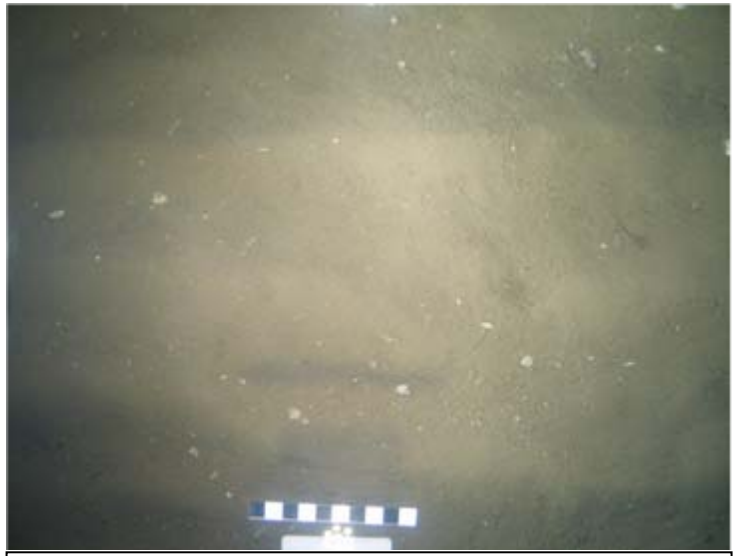
Fix: 79 **E:** 442666 **N:** 6106583 **Depth:** 34m

Station: TB_33
Sediment Description:
Fix73: Rippled fine sand with occasional shell fragments

Fix79: Rippled fine sand with occasional shell fragments

Fauna Description:
Fix73: Annelida (Polychaeta) - Polychaete tubes

Fix79: Annelida (Polychaeta) - Polychaete tubes



Fix: 85* **E:** 442657 **N:** 6106569 **Depth:** 34m

Fix: 16 **E:** 442650 **N:** 6106620 **Depth:** 34m

Station: TB_33
Sediment Description:
Fix85*: Rippled fine sand with occasional shell fragments

Grab: Sand with occasional shell fragments

Fauna Description:
Fix85*: Annelida (Polychaeta) - Polychaete tubes

Grab: Annelida (Polychaeta) - Polychaete tubes

* No sieve picture taken at the time of sampling

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 127 **E:** 447665 **N:** 6106874 **Depth:** 32m

Fix: 140 **E:** 447671 **N:** 6106925 **Depth:** 32m

Station: TB_34
Sediment Description:
Fix127: Rippled fine sand with shell fragments

Fix140: Rippled fine sand with shell fragments

Fauna Description:
Fix127: Annelida (Polychaeta) - Polychaete tubes, Other - Chordata – Pleuronectiformes

Fix140: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Astropecten irregularis,* Cnidaria - Hydrozoa

Fix: 11 **E:** 447685 **N:** 6106907 **Depth:** 32m

Fix: 11 **E:** 447685 **N:** 6106907 **Retention:** Fauna/PSA

Station: TB_34
Sediment Description:
Grab: Fine sand with occasional shell fragments

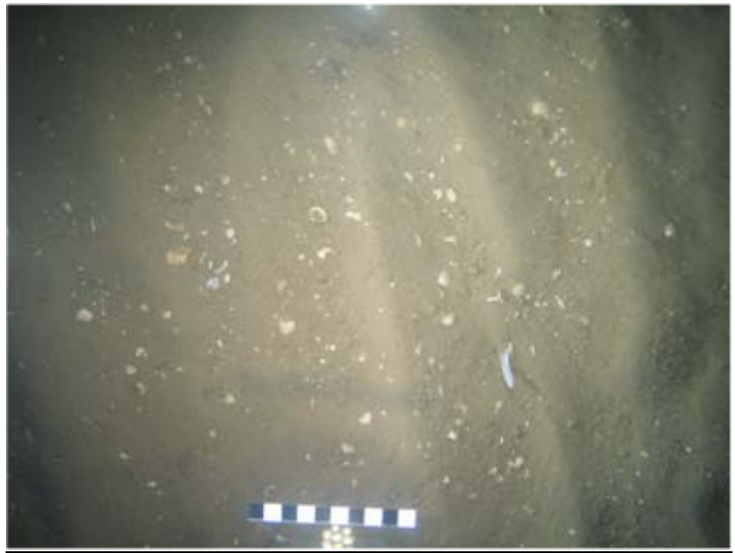
Sieve: Small to medium shells and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes, Mollusca - Solenidae

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 154 **E:** 453295 **N:** 6103786 **Depth:** 31m

Fix: 166 **E:** 453316 **N:** 6103802 **Depth:** 31m

Station: TB_35
Sediment Description:
Fix154: Rippled fine sand with shell fragments

Fix166: Rippled fine sand with shell fragments and occasional large shells

Fauna Description:
Fix154: Annelida (Polychaeta) - Polychaete tubes

Fix166: Annelida (Polychaeta) - Polychaete tubes

Fix: 31 **E:** 453306 **N:** 6103804 **Depth:** 31m

Fix: 31 **E:** 453306 **N:** 6103804 **Retention:** Fauna/PSA

Station: TB_35
Sediment Description:
Grab: Fine sand with occasional shell fragments

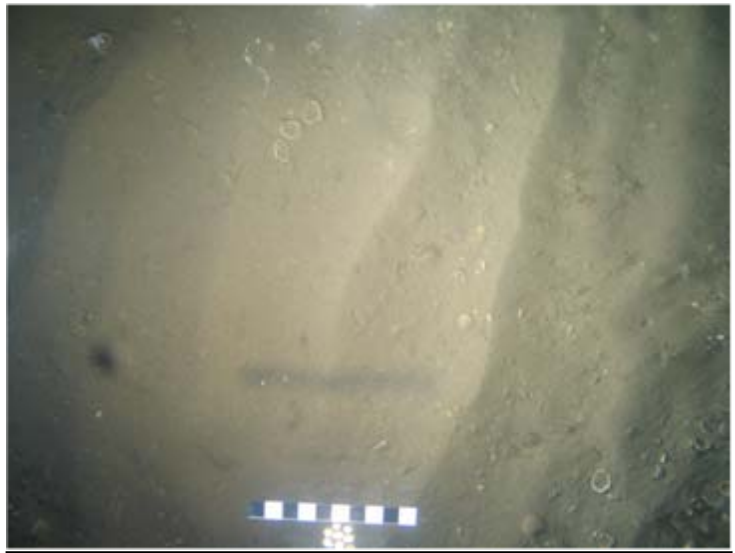
Sieve: Small shells and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

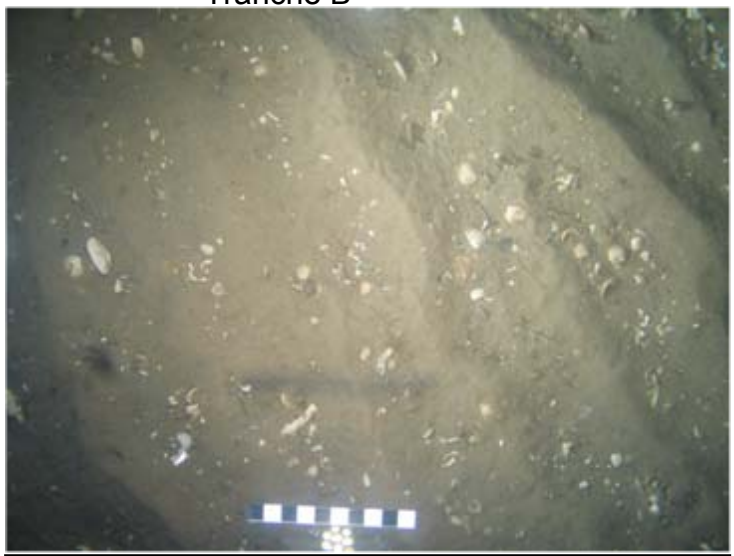
Sieve: Annelida (Polychaeta) – Polychaeta, Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 114 **E:** 445930 **N:** 6105983 **Depth:** 31m



Fix: 120 **E:** 445926 **N:** 6106021 **Depth:** 31m

Station: TB_36
Sediment Description:
Fix114: Rippled fine sand with small shells and shell fragments

Fix120: Rippled fine sand with small shells and shell fragments

Fauna Description:
Fix114: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria – Hydrozoa

Fix120: Annelida (Polychaeta) - Polychaete tubes

Fix: 12 **E:** 445937 **N:** 6106024 **Depth:** 31m

Fix: 12 **E:** 445937 **N:** 6106024 **Retention:** Fauna/PSA

Station: TB_36
Sediment Description:
Grab: Fine sand with occasional shell fragments

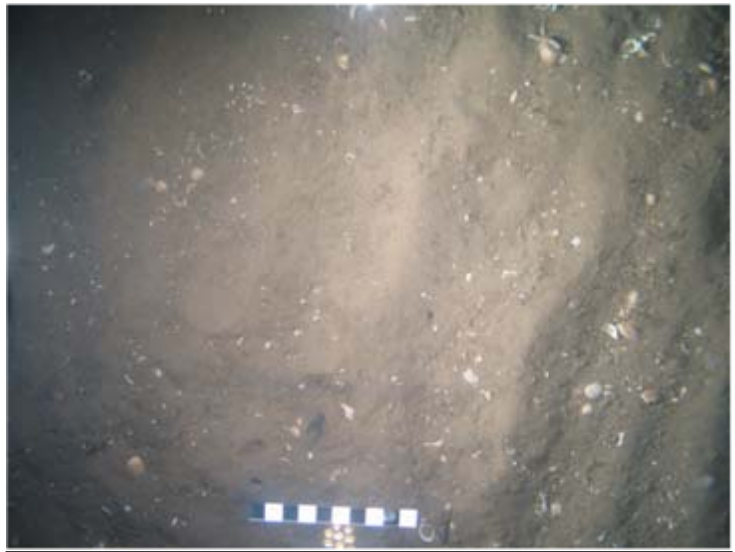
Sieve: Small to medium shells and shell fragments

Fauna Description:
Grab: No visible fauna

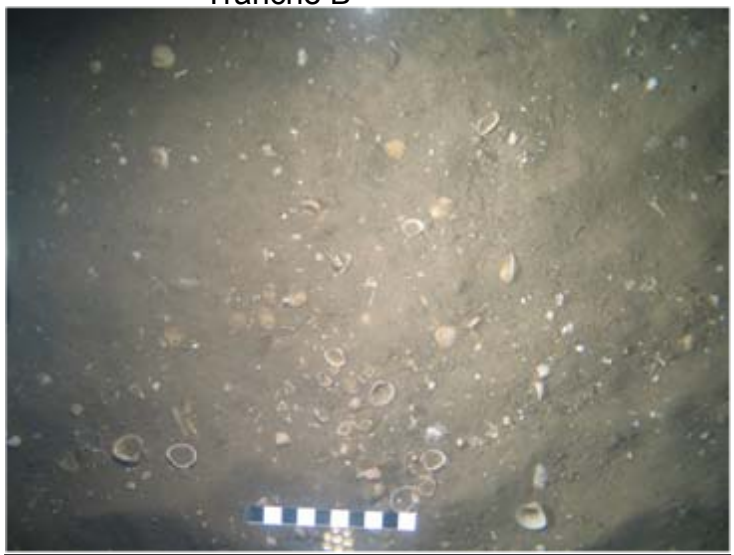
Sieve: Annelida (Polychaeta) - Polychaeta, Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 304 **E:** 473876 **N:** 6110698 **Depth:** 31m



Fix: 311 **E:** 473880 **N:** 6110701 **Depth:** 31m

Station: TB_37
Sediment Description:
Fix304: Rippled fine sand with shell fragments

Fix311: Rippled fine sand with small shells and shell fragments

Fauna Description:
Fix304: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Asterias rubens,* Cnidaria - Hydrozoa

Fix311: Annelida (Polychaeta) - Polychaete tubes

Fix: 43 **E:** 473873 **N:** 6110683 **Depth:** 31m

Fix: 43 **E:** 473873 **N:** 6110683 **Retention:** Fauna/PSA

Station: TB_37
Sediment Description:
Grab: Fine sand with shells and occasional shell fragments

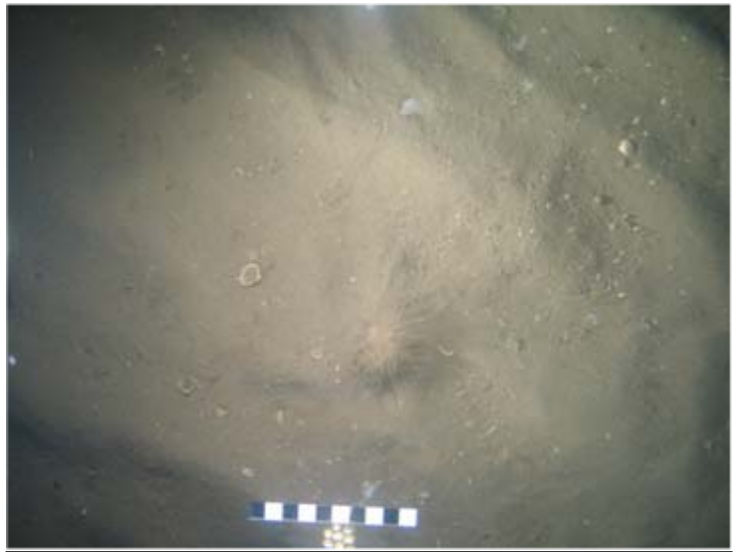
Sieve: Small shells and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes and Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 142 **E:** 453268 **N:** 6105523 **Depth:** 30m

Fix: 150 **E:** 453277 **N:** 6105510 **Depth:** 30m

Station: TB_38
Sediment Description:
Fix142: Rippled fine sand with small shells and shell fragments

Fix150: Rippled fine sand with occasional shell fragments

Fauna Description:
Fix142: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - Hydrozoa

Fix150: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Astropecten irregularis*

Fix: 33 **E:** 453313 **N:** 6105524 **Depth:** 30m

Fix: 33 **E:** 453313 **N:** 6105524 **Retention:** Fauna/PSA

Station: TB_38
Sediment Description:
Grab: Fine sand with shell fragments

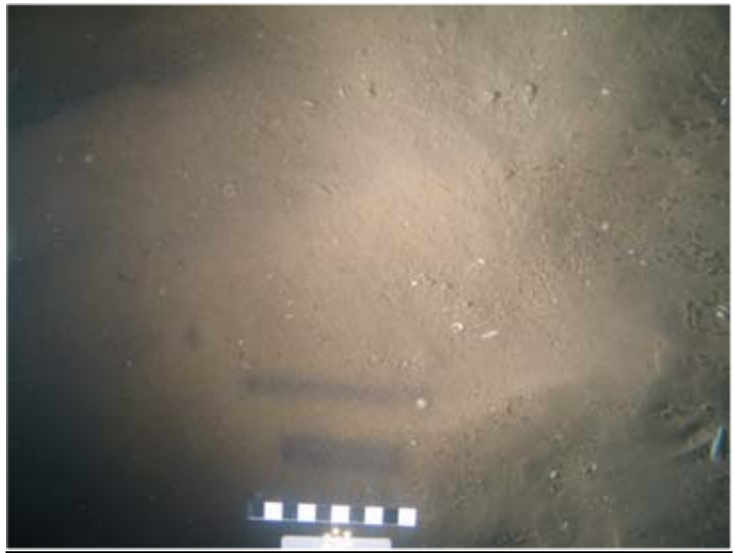
Sieve: Small shells and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes, Mollusca - Solenidae

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 31 **E:** 439356 **N:** 6103275 **Depth:** 31m

Fix: 35 **E:** 439368 **N:** 6103263 **Depth:** 31m

Station: TB_39
Sediment Description:
Fix31: Rippled fine sand with occasional shell fragments

Fix35: Rippled fine sand with occasional shell fragments

Fauna Description:
Fix31: Annelida (Polychaeta) - Polychaete tubes

Fix35: Annelida (Polychaeta) Polychaete tubes, Echinodermata - Asteroidea

Fix: 6 **E:** 439300 **N:** 6103255 **Depth:** 31m

Fix: 6 **E:** 439300 **N:** 6103255 **Retention:** Fauna/PSA

Station: TB_39
Sediment Description:
Grab: Fine sand with shell fragments

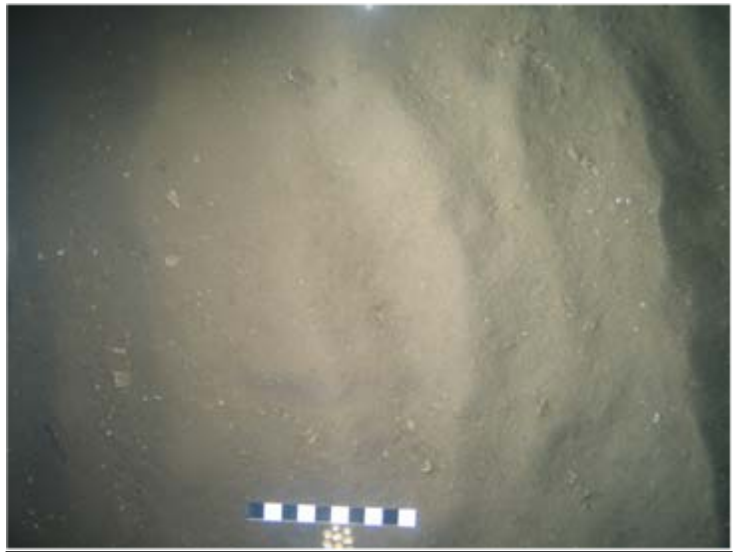
Sieve: Small shells and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 224 **E:** 463398 **N:** 6107104 **Depth:** 33m

Fix: 234 **E:** 463393 **N:** 6107139 **Depth:** 33m

Station: TB_40
Sediment Description:
Fix224: Rippled fine sand with occasional shell fragments

Fix234: Rippled fine sand with occasional shell fragments

Fauna Description:
Fix224: Annelida (Polychaeta) - Polychaete tubes

Fix234: Annelida (Polychaeta) - Polychaete tubes

Fix: 36 **E:** 463440 **N:** 6107067 **Depth:** 32m

Fix: 36 **E:** 463440 **N:** 6107067 **Retention:** Fauna

Station: TB_40
Sediment Description:
Grab: Fine sand with shell fragments

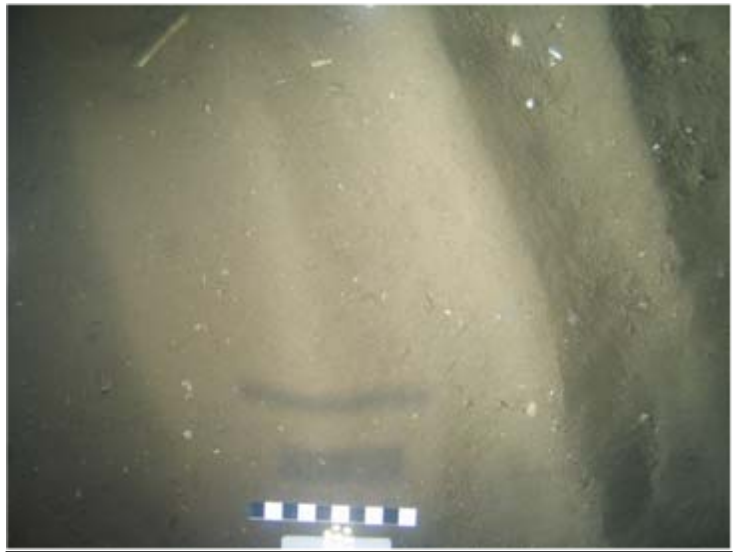
Sieve: Small shells and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 86 **E:** 443783 **N:** 6106430 **Depth:** 33m

Fix: 91 **E:** 443780 **N:** 6106430 **Depth:** 33m

Station: TB_41
Sediment Description:
Fix86: Rippled fine sand with shell fragments

Fix91: Rippled fine sand with shell fragments

Fauna Description:
Fix86: Annelida (Polychaeta) - Polychaete tubes

Fix91: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Astropecten irregularis*, bioturbation

Fix: 14 **E:** 443762 **N:** 6106440 **Depth:** 33m

Fix: 14 **E:** 443762 **N:** 6106440 **Retention:** Fauna/PSA

Station: TB_41
Sediment Description:
Grab: Fine sand with shell fragments

Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 100 **E:** 445476 **N:** 6106986 **Depth:** 32m

Fix: 107 **E:** 445444 **N:** 6106955 **Depth:** 32m

Station: TB_42
Sediment Description:
Fix100: Rippled fine sand with small shells and shell fragments

Fix107: Rippled fine sand with small shells and shell fragments

Fauna Description:
Fix100: Annelida (Polychaeta) - Polychaete tubes

Fix107: Annelida (Polychaeta) - Polychaete tubes

Fix: 13 **E:** 445430 **N:** 6106963 **Depth:** 32m

Fix: 13 **E:** 445430 **N:** 6106963 **Retention:** Fauna/PSA

Station: TB_42
Sediment Description:
Grab: Fine sand with shell fragments

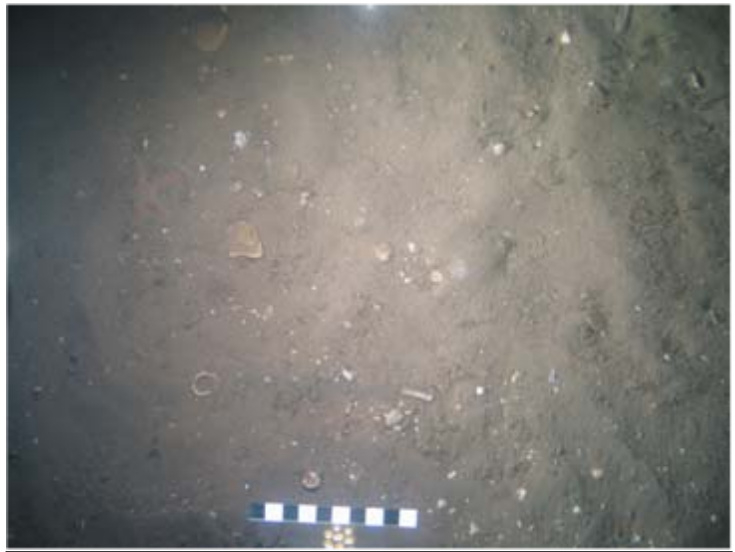
Sieve: Small shells and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 273 **E:** 466809 **N:** 6106954 **Depth:** 34m

Fix: 278 **E:** 466804 **N:** 6106931 **Depth:** 34m

Station: TB_43
Sediment Description:
Fix273: Fine to medium with shell fragments

Fix278: Fine to medium with shell fragments

Fauna Description:
Fix273: Annelida (Polychaeta) - Polychaete tubes, Mollusca - Bivalvia, Echinodermata - *Asterias rubens*

Fix278: No visible fauna

Fix: 42 **E:** 466775 **N:** 6106984 **Depth:** 34m

Fix: 42 **E:** 466775 **N:** 6106984 **Retention:** MF

Station: TB_43
Sediment Description:
Grab: Fine sand with occasional shell fragments

Sieve: Fine shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 176 **E:** 459525 **N:** 6103706 **Depth:** 33m

Fix: 180 **E:** 459530 **N:** 6103692 **Depth:** 33m

Station: TB_44
Sediment Description:
Fix176: Fine to medium with shell fragments

Fix180: Fine to medium with shell fragments

Fauna Description:
Fix176: Annelida (Polychaeta) - Polychaete tubes

Fix180: Anthopoda (Crustacea) - Paguridae

Fix: 27 **E:** 459559 **N:** 6103712 **Depth:** 33m

Fix: 27 **E:** 459559 **N:** 6103712 **Retention:** MF

Station: TB_44
Sediment Description:
Grab: Fine to medium sand with shell fragments

Sieve: Fine shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 283 **E:** 465470 **N:** 6104609 **Depth:** 31m

Fix: 288 **E:** 465465 **N:** 6104605 **Depth:** 32m

Station: TB_45
Sediment Description:
Fix283: Fine to medium with shell fragments

Fix288: Fine to medium with shell fragments

Fauna Description:
Fix283: Echinodermata - *Astropecten irregularis*

Fix288: Echinodermata - *Asterias rubens*

Fix: 34 **E:** 465453 **N:** 6104652 **Depth:** 31m

Fix: 34 **E:** 465453 **N:** 6104652 **Retention:** MF

Station: TB_45
Sediment Description:
Grab: Fine sand with some shell fragments

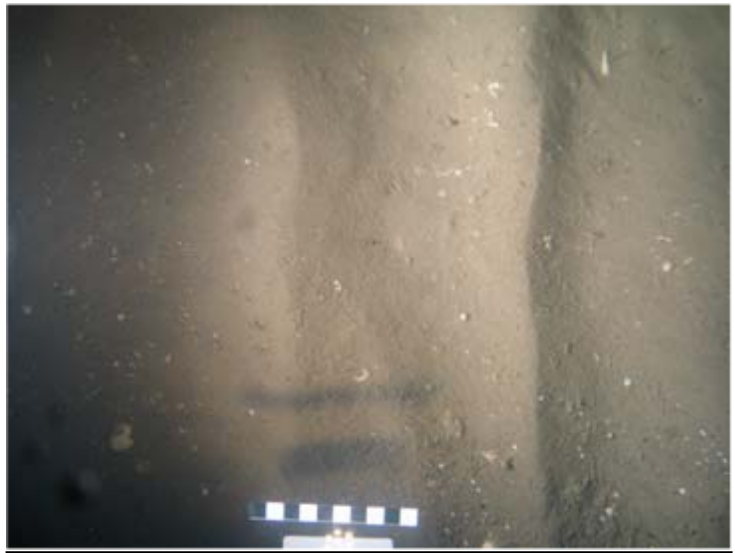
Sieve: Whole shells and shell fragments

Fauna Description:
Grab: No visible fauna

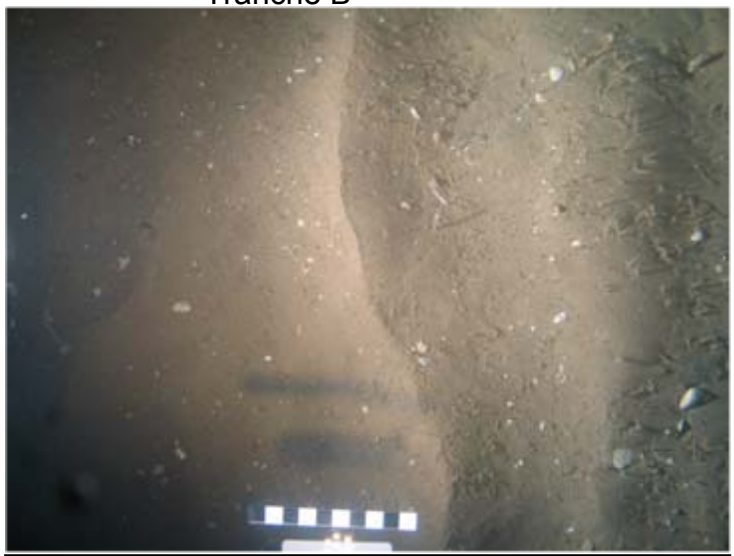
Sieve: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 13 **E:** 435181 **N:** 6105620 **Depth:** 31m



Fix: 17 **E:** 435137 **N:** 6105590 **Depth:** 32m

Station: TB_46
Sediment Description:
Fix13: Fine to medium with shell fragments

Fix17: Fine to medium with shell fragments

Fauna Description:
Fix13: Annelida (Polychaeta) - Polychaete tubes

Fix17: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - Ophiuroidea

Fix: 10 **E:** 435132 **N:** 6105632 **Depth:** 32m

Fix: 10 **E:** 435132 **N:** 6105632 **Retention:** MF

Station: TB_46
Sediment Description:
Grab: Fine sand

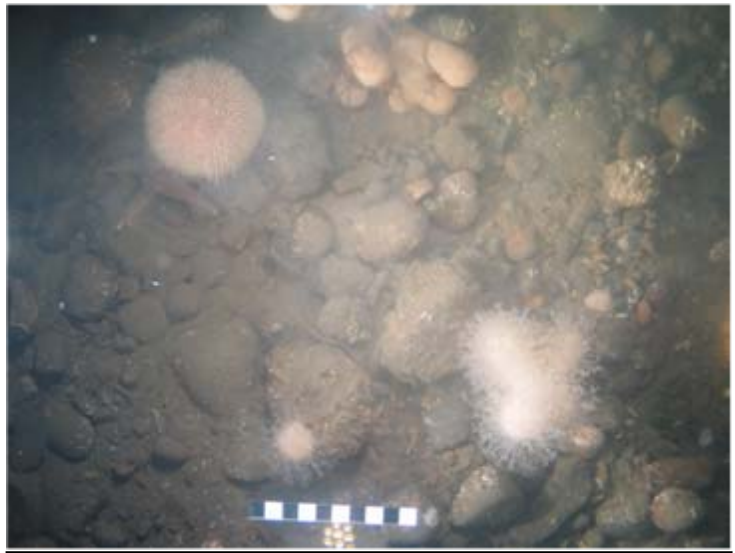
Sieve: Whole shells and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 294 **E:** 466483 **N:** 6105343 **Depth:** 32m

Fix: 298 **E:** 466478 **N:** 6105328 **Depth:** 32m

Station: TB_47
Sediment Description:
Fix294: Fine to medium sand with gravel, cobbles, some shell fragments

Fix298: Fine to medium sand with gravel, cobbles, some shell fragments

Fauna Description:
Fix294: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Echninus esculentus*, *Asterias rubens*, *Ophiothrix fragilis*, Ophiuroidae, Other - Cnidaria - *Alcyonium* sp.

Fix298: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Astropecten irregularis*, *Ophiothrix fragilis*, Ophiuroidae, Other - Cnidaria - *Alcyonium* sp., Porifera

Fix: 299 **E:** 466472 **N:** 6105314 **Depth:** 32m

Fix: 300 **E:** 466498 **N:** 6105327 **Depth:** 32m

Station: TB_47
Sediment Description:
Fix299: Fine to medium sand with gravel, cobbles, some shell fragments

Fix300: Fine to medium sand with gravel, cobbles, some shell fragments

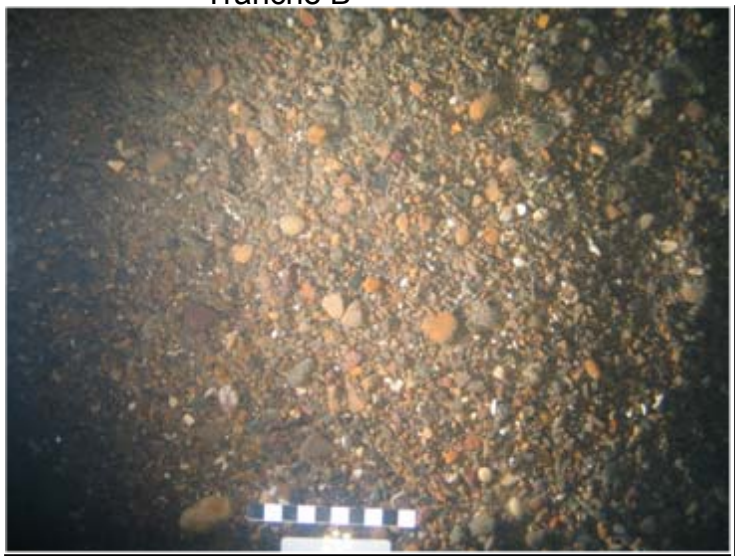
Fauna Description:
Fix299: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Astropecten irregularis*, *Ophiothrix fragilis*, Ophiuroidae, Other - Cnidaria - *Alcyonium* sp.

Fix300: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Ophiuroidae, Other - Cnidaria - *Alcyonium* sp., Hydrozoa

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 20 **E:** 436728 **N:** 6104318 **Depth:** 34m



Fix: 23 **E:** 436723 **N:** 6104310 **Depth:** 34m

Station: TB_48
Sediment Description:
Fix20: Fine to medium sand with gravel, cobbles and some shell fragments

Fix23: Fine to medium sand with gravel, cobbles and some shell fragments

Fauna Description:
Fix20: Echinodermata - *Asterias rubens*

Fix23: Other - Cnidaria - Hydrozoa

Fix: 7 **E:** 436715 **N:** 6104322 **Depth:** 34m

Fix: 7 **E:** 436715 **N:** 6104322 **Retention:** MF

Station: TB_48
Sediment Description:
Grab: Gravel with cobbles and some coarse sand

Sieve: Fine to medium gravel with cobbles

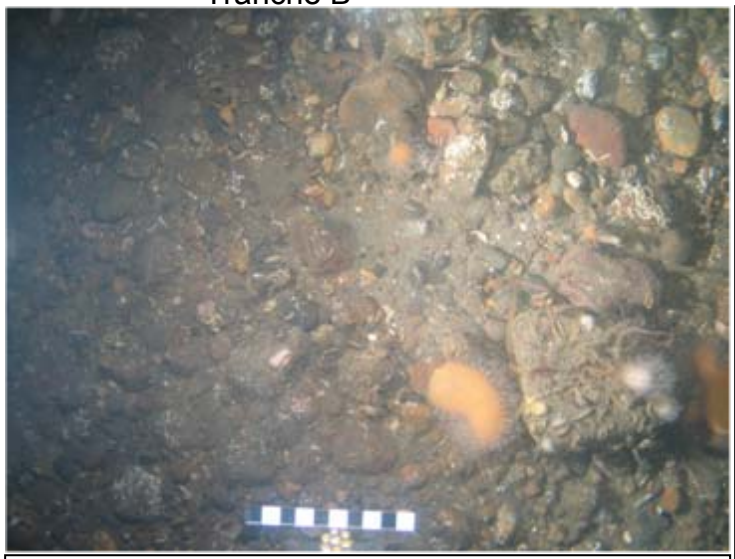
Fauna Description:
Grab: Annelida (Crustacea) - *Spirobranchus* sp.

Sieve: Annelida (Crustacea) - *Spirobranchus* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 192 **E:** 459948 **N:** 6104474 **Depth:** 33m



Fix: 198 **E:** 459954 **N:** 6104478 **Depth:** 33m

Station: TB_49
Sediment Description:
Fix192: Gravel with shell fragment and occasional cobbles

Fix198: Gravel with shell fragment and occasional cobbles

Fauna Description:
Fix192: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Ophiuroidae, Other - Cnidaria - *Alcyonium* sp., Porifera

Fix198: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Asterias rubens*, Ophiotrichidae, *Ophiura albida, Ophiura ophiura*, Other - Cnidaria *Alcyonium* sp., Hydrozoa, Porifera

Fix: 25 **E:** 459974 **N:** 6104483 **Depth:** 33m

Fix: 25 **E:** 459974 **N:** 6104483 **Retention:** MF

Station: TB_49
Sediment Description:
Grab: Fine to medium sand with gravel, cobbles and shell fragments

Sieve: Gravel, cobbles and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - *Spirobranchus* sp.

Sieve: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Bivalvia, Echinodermata - *Ophiothrix fragilis*, Ophiuroidae

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 169 **E:** 455811 **N:** 6102508 **Depth:** 34m

Fix: 172 **E:** 455811 **N:** 6102513 **Depth:** 34m

Station: TB_50
Sediment Description:
Fix169: Coarse sand with shell fragments and gravel

Fix172: Coarse sand with shell fragments and gravel

Fauna Description:
Fix169: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Paguridae, *Cancer pagurus*, Echinodermata - *Ophiothrix fragilis*, Ophiuroidae, Other - Cnidaria *Alcyonium* sp., Hydrozoa, Porifera

Fix172: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Psammechinus* sp., Other - Cnidaria *Alcyonium* sp., Porifera

Fix: 30 **E:** 455786 **N:** 6102515 **Depth:** 34m

Fix: 30 **E:** 455786 **N:** 6102515 **Retention:** MF

Station: TB_50
Sediment Description:
Grab: A mix of fine to coarse sand with gravel, cobbles and shell fragments

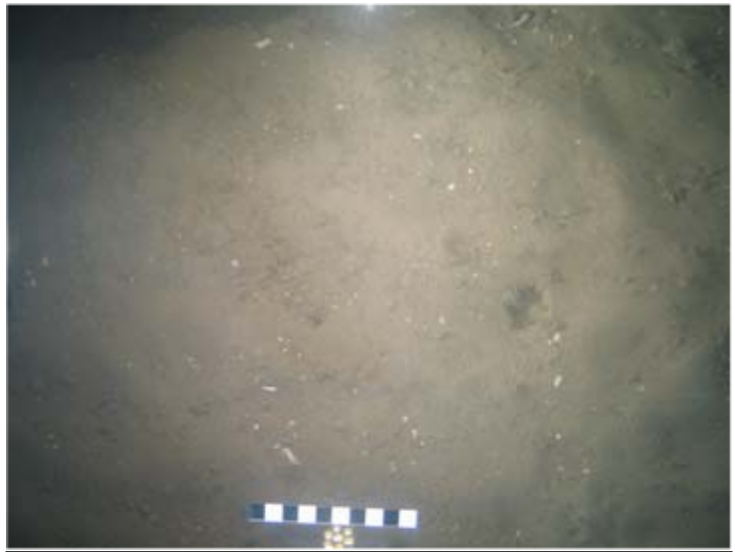
Sieve: Gravel, cobbles and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - *Spirobranchus* sp.

Sieve: No visible fauna

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 236 **E:** 464249 **N:** 6108874 **Depth:** 36m

Fix: 240 **E:** 464201 **N:** 6108881 **Depth:** 36m

Station: TB_51
Sediment Description:
Fix236: Medium sand with shell fragments

Fix240: Medium sand with shell fragments

Fauna Description:
Fix236: No visible fauna

Fix240: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - Hydrozoa

Fix: 40 **E:** 464238 **N:** 6108846 **Depth:** 36m

Fix: 40 **E:** 464238 **N:** 6108846 **Retention:** MF

Station: TB_51
Sediment Description:
Grab: Fine sand with occasional shell fragments

Sieve: Fine sand with occasional shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Paguridae, Mollusca - Bivalvia

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 217 **E:** 459072 **N:** 6106394 **Depth:** 36m

Fix: 222 **E:** 459080 **N:** 6106381 **Depth:** 36m

Station: TB_52
Sediment Description:
Fix217: Medium sand with shell fragments

Fix222: Medium sand with shell fragments

Fauna Description:
Fix217: Annelida (Polychaeta) - Polychaete tubes, Mollusca - Bivalvia

Fix222: Echinodermata - *Asterias rubens*

Fix: 17 **E:** 459049 **N:** 6106399 **Depth:** 36m

Fix: 17 **E:** 459049 **N:** 6106399 **Retention:** MF

Station: TB_52
Sediment Description:
Grab: Fine to medium compact with shell fragments

Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 204 **E:** 459305 **N:** 6105721 **Depth:** 36m

Fix: 206 **E:** 459322 **N:** 6105727 **Depth:** 36m

Station: TB_53
Sediment Description:
Fix204: A mix of fine to coarse sand with pebbles, cobbles and shell fragments

Fix206: A mix of fine to coarse sand with pebbles, cobbles and shell fragments

Fauna Description:
Fix204: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Ophiuroidae, Other - Cnidaria - *Alcyonium* sp., Hydrozoa, Porifera

Fix206: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiotrichidae, Other - Cnidaria - *Alcyonium* sp., Hydrozoa, Porifera

Fix: 21 **E:** 459318 **N:** 6105741 **Depth:** 37m

Fix: 21 **E:** 459318 **N:** 6105741 **Retention:** MF

Station: TB_53
Sediment Description:
Grab: Medium to coarse sand with gravel, cobbles and shell fragments

Sieve: Gravel, cobbles and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Ophiuroidae, Mollusca - Bivalvia

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 250 **E:** 466209 **N:** 6109720 **Depth:** 37m

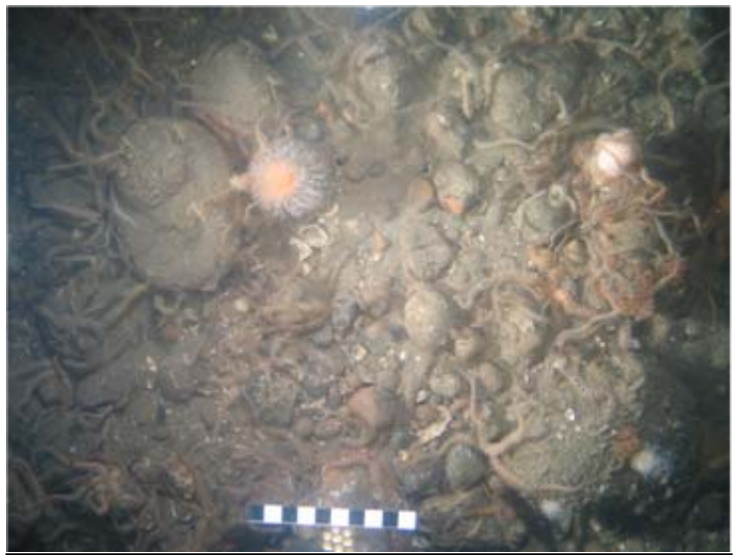
Fix: 252 **E:** 466220 **N:** 6109715 **Depth:** 37m

Station: TB_54
Sediment Description:
Fix250: A mix of fine to coarse sand with patches of gravel, pebbles, cobbles and shell fragments

Fix252: A mix of fine to coarse sand with patches of gravel, pebbles, cobbles and shell fragments

Fauna Description:
Fix250: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Paguridae, Other - Porifera

Fix252: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Ophiuroidae, Ophiura ophiura, Other - Cnidaria - Alcyonium sp., Hydrozoa, Porifera



Fix: 254 **E:** 466241 **N:** 6109717 **Depth:** 37m

Fix: 257 **E:** 466250 **N:** 6109703 **Depth:** 37m

Station: TB_54
Sediment Description:
Fix254: A mix of fine to coarse sand with patches of gravel, pebbles, cobbles and shell fragments

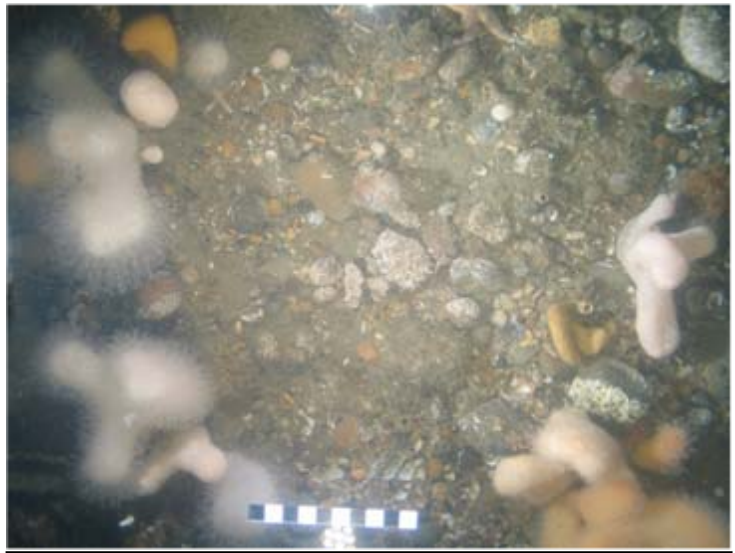
Fix257: A mix of fine to coarse sand with patches of gravel, pebbles, cobbles and shell fragments

Fauna Description:
Fix254: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiotrichidae, *Ophiothrix fragilis*, Other - Cnidaria - *Alcyonium* sp., Hydrozoa, Porifera

Fix257: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiotrichidae, *Ophiothrix fragilis*, Other - Cnidaria - *Alcyonium* sp., Hydrozoa, Porifera

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 615 **E:** 460080 **N:** 6091990 **Depth:** 28m

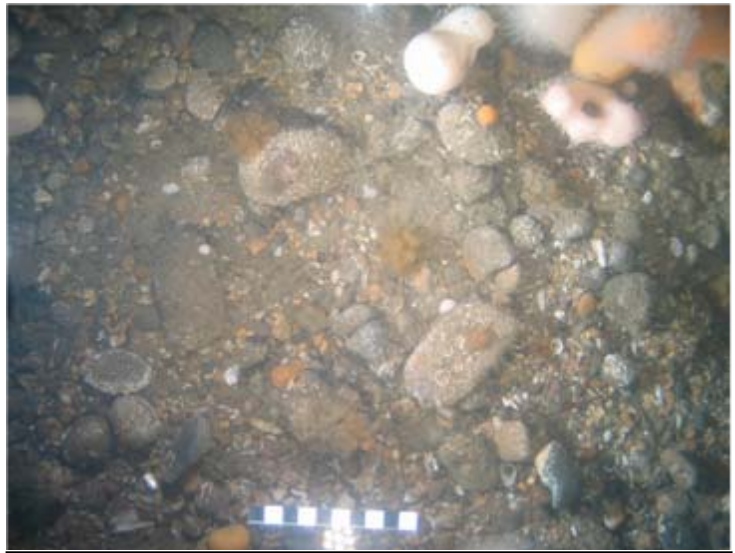
Fix: 617 **E:** 460089 **N:** 6091990 **Depth:** 28m

Station: TB_55
Sediment Description:
Fix615: Gravel with cobbles, pebbles and shell fragments

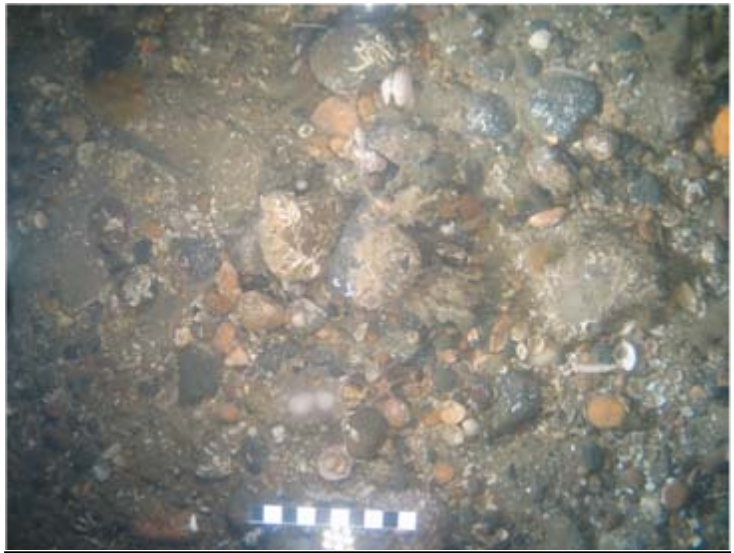
Fix617: Gravel with cobbles, pebbles and shell fragments

Fauna Description:
Fix615: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Bivalvia, Echinodermata - *Asterias rubens*, Other - Cnidaria - *Alcyonium* sp., Hydrozoa

Fix617: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Bivalvia, Other - Cnidaria - *Alcyonium* sp., Hydrozoa, Porifera



Fix: 620 **E:** 460092 **N:** 6091981 **Depth:** 28m



Fix: 623 **E:** 460069 **N:** 6091954 **Depth:** 28m

Station: TB_55
Sediment Description:
Fix620: Gravel with cobbles, pebbles and shell fragments

Fix623: Gravel with cobbles, pebbles and shell fragments

Fauna Description:
Fix620: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Paguridae, Mollusca - Bivalvia, Other - Cnidaria *Alcyonium* sp., Hydrozoa, Porifera

Fix623: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Bivalvia, Echinodermata - *Ophiura albida*, Other - Cnidaria - *Alcyonium* sp., Hydrozoa, Porifera

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 965 **E:** 438118 **N:** 6102816 **Depth:** 36

Fix: 969 **E:** 438136 **N:** 6102838 **Depth:** 36

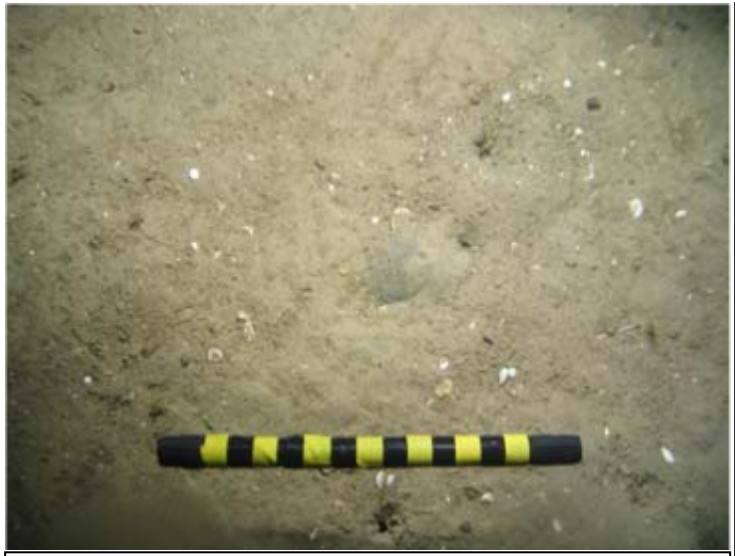
Station: TB_TRAN_01
Sediment Description:
Fix965: Gravelly sand with coarse gravel, frequent pebbles and occasional shell fragments

Fix969: Silty gravelly sand with coarse gravel, frequent pebbles and occasional shell fragments

Fauna Description:
Fix965: No visible fauna

Fix969: No visible fauna

Fix: 978 **E:** 438190 **N:** 6102894 **Depth:** 36



Fix: 983 **E:** 438215 **N:** 6102919 **Depth:** 36

Station: TB_TRAN_01
Sediment Description:
Fix978: Boulders with Fine Sand, course gravel and shell fragments

Fix983: Fine Sand with occasional coarse gravel and occasional shell fragments

Fauna Description:
Fix978: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Ebalia* sp., Echinodermata - *Ophiothrix fragilis*, Other - Bryozoa - *Flustra foliacea*, Cnidaria - Hydrozoa, *Alcyonium* sp., Porifera

Fix983: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 903 **E:** 455636 **N:** 6102501 **Depth:** 34

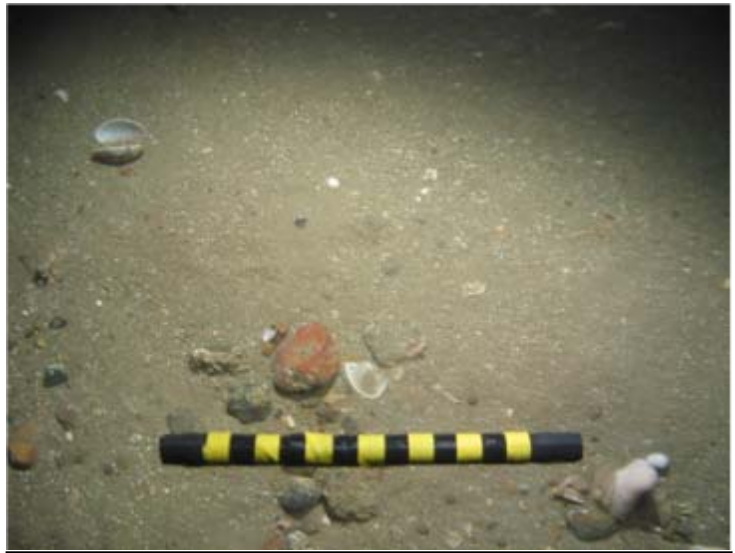
Fix: 931 **E:** 455731 **N:** 6102407 **Depth:** 35

Station: TB_TRAN_02
Sediment Description:
Fix903: Gravel with frequent pebbles and cobbles and occasional shell fragments

Fix931: Gravel with frequent pebbles and cobbles and occasional shell fragments

Fauna Description:
Fix903: Annelida (Polychaeta) *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, *Psammechinus* sp., Other - Cnidaria - *Alcyonium* sp.

Fix931: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Paguridae, Echinodermata - *Psammechinus* sp.



Fix: 947 **E:** 455763 **N:** 6102365 **Depth:** 35

Fix: 955 **E:** 455794 **N:** 6102352 **Depth:** 35

Station: TB_TRAN_02
Sediment Description:
Fix947: Fine Sand with occasional coarse gravel and frequent shell fragments

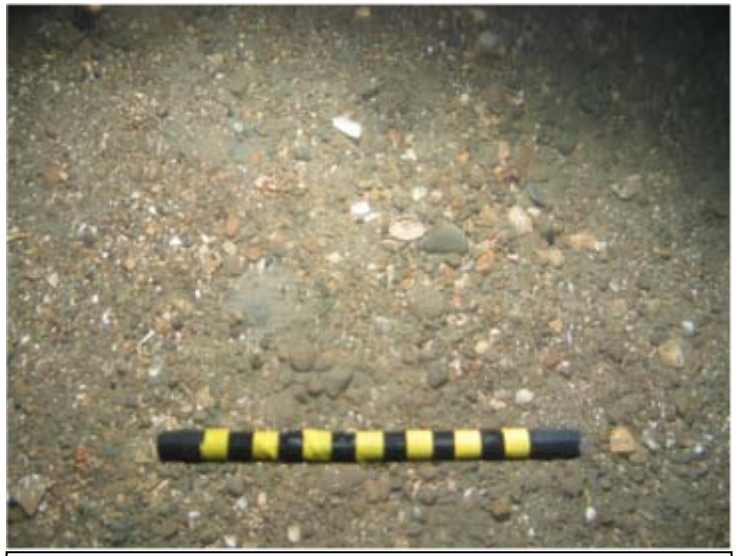
Fix955: Gravel with frequent pebbles and cobbles and occasional shell fragments

Fauna Description:
Fix947: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis,* Psammechinus sp., Other - Cnidaria - Alcyonium sp.

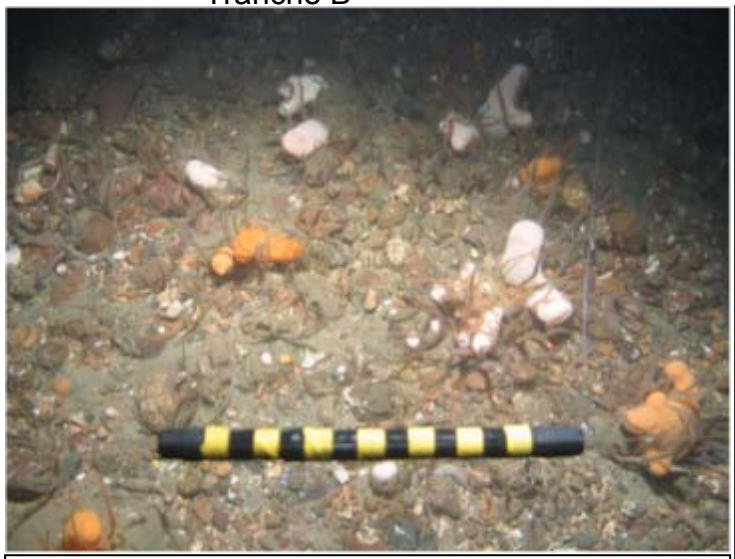
Fix955: Annelida (Polychaeta) - Spirobranchus sp., Echinodermata - Ophiothrix fragilis, *Psammechinus* sp., Other - Cnidaria - *Alcyonium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 859 **E:** 459922 **N:** 6104441 **Depth:** 33



Fix: 871 **E:** 459854 **N:** 6104356 **Depth:** 33

Station: TB_TRAN_03
Sediment Description:
Fix859: Gravel with frequent pebbles and cobbles and occasional shell fragments

Fix871: Sandy Gravel with frequent pebbles and cobbles and occasional shell fragments

Fauna Description:
Fix859: No visible fauna

Fix871: Annelida -(Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis,* Psammechinus sp., Other - Cnidaria - Alcyonium sp.

Fix: 879 **E:** 459824 **N:** 6104308 **Depth:** 33

Fix: 892 **E:** 459748 **N:** 6104192 **Depth:** 31

Station: TB_TRAN_03
Sediment Description:
Fix879: Sandy Gravel with frequent pebbles and cobbles and occasional shell fragments

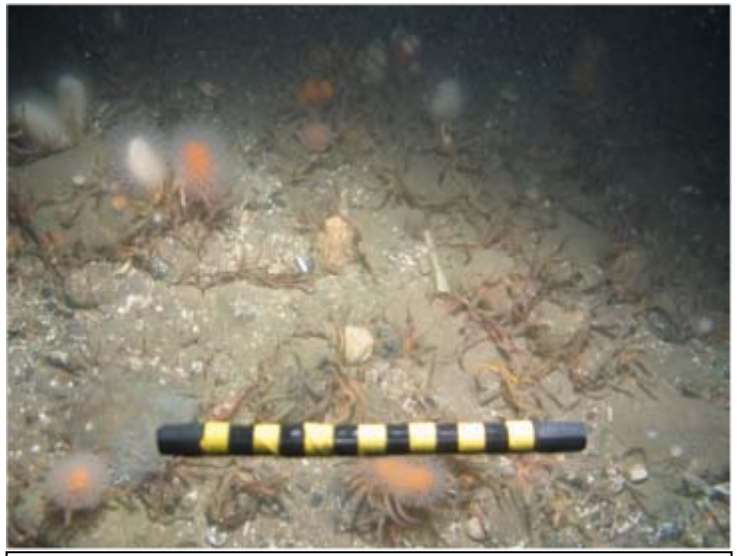
Fix892: Sand with occasional shell fragments

Fauna Description:
Fix879: Annelida (Polychaeta) *Spirobranchus* sp., Echinodermata - *Asterias rubens*, Other – Cnidaria - Hydrozoa

Fix892: No visible fauna

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 819 **E:** 459308 **N:** 6105728 **Depth:** 33

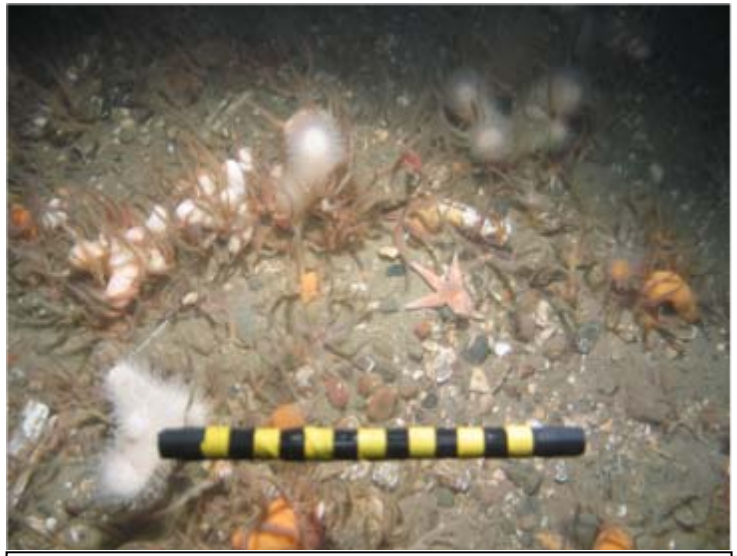
Fix: 824 **E:** 459325 **N:** 6105715 **Depth:** 37

Station: TB_TRAN_04
Sediment Description:
Fix819: Gravelly sand with frequent pebbles, cobbles and shell fragments

Fix824: Gravelly sand with frequent pebbles and cobbles and frequent shell fragments

Fauna Description:
Fix819: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Other – Cnidaria - *Alcyonium* sp.

Fix824: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis, Ophiura albida*



Fix: 839 **E:** 459389 **N:** 6105652 **Depth:** 36

Fix: 854 **E:** 459481 **N:** 6105557 **Depth:** 36

Station: TB_TRAN_04
Sediment Description:
Fix839: Sandy gravel with frequent pebbles and cobbles and frequent shell fragments

Fix854: Sand with occasional pebbles and frequent shell fragments

Fauna Description:
Fix839: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis, Asterias rubens*, Other - Cnidaria - *Alcyonium* sp.

Fix854: No visible fauna

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 751 **E:** 466467 **N:** 6105359 **Depth:** 33

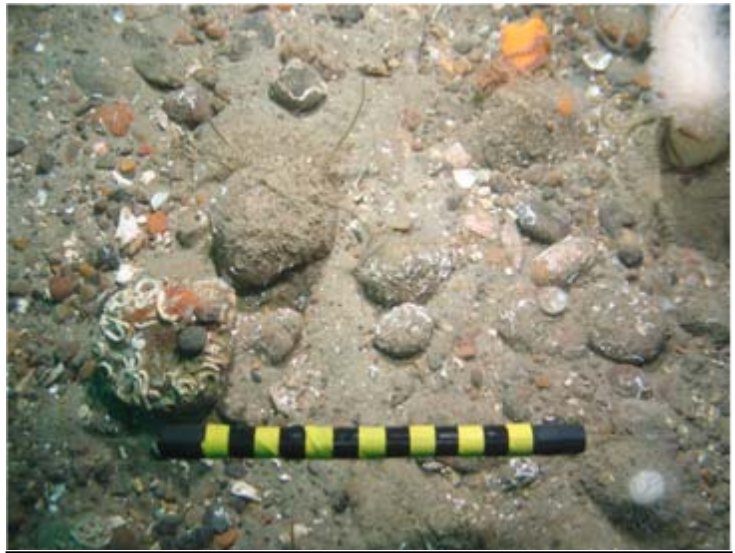
Fix: 755 **E:** 466489 **N:** 6105333 **Depth:** 32

Station: TB_TRAN_05
Sediment Description:
Fix751: Sand with occasional pebbles and frequent shell fragments

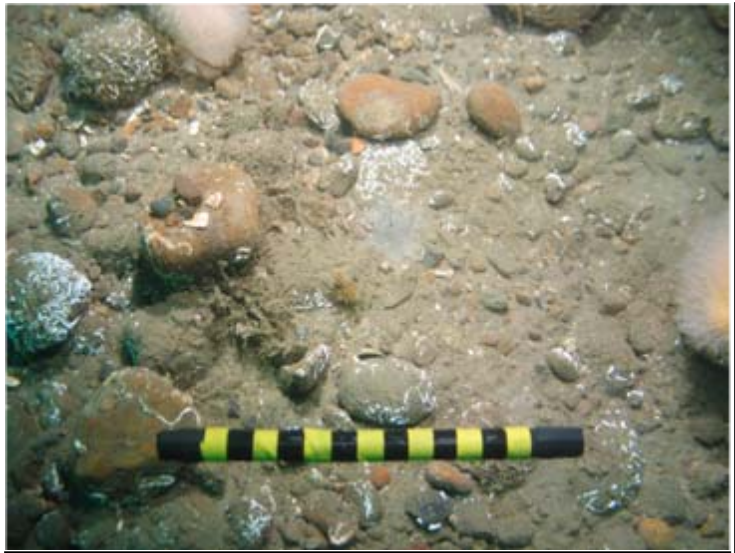
Fix755: Sandy gravel with frequent pebbles and cobbles and frequent shell fragments

Fauna Description:
Fix751: Other - Bryozoa

Fix755: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Other - Bryozoa



Fix: 761 **E:** 466497 **N:** 6105292 **Depth:** 32



Fix: 770 **E:** 466579 **N:** 6105171 **Depth:** 32

Station: TB_TRAN_05
Sediment Description:
Fix761: Sandy gravel with frequent pebbles and cobbles and occasional shell fragments

Fix770: Gravel with frequent pebbles and cobbles and occasional shell fragments

Fauna Description:
Fix761: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Other – Cnidaria - *Alcyonium* sp.

Fix770: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata (*Ophiothrix fragilis*), Other – Bryozoa - Cnidaria - *Alcyonium* sp., Hydrozoa

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 789 **E:** 466327 **N:** 6109723 **Depth:** 39

Fix: 794 **E:** 466382 **N:** 6109723 **Depth:** 34

Station: TB_TRAN_06
Sediment Description:
Fix789: Silty sand with occasional pebbles and frequent shell fragments

Fix794: Silty sand with occasional pebbles and cobbles and frequent shell fragments

Fauna Description:
Fix789: No visible fauna

Fix794: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Other – Cnidaria - *Alcyonium* sp.

Fix: 796 **E:** 466389 **N:** 6109721 **Depth:** 38

Fix: 806 **E:** 466451 **N:** 6109719 **Depth:** 38

Station: TB_TRAN_06
Sediment Description:
Fix796: Silty sand with frequent cobbles and frequent shell fragments

Fix806: Silty sand with frequent pebbles, cobbles and a boulder and occasional shell fragments

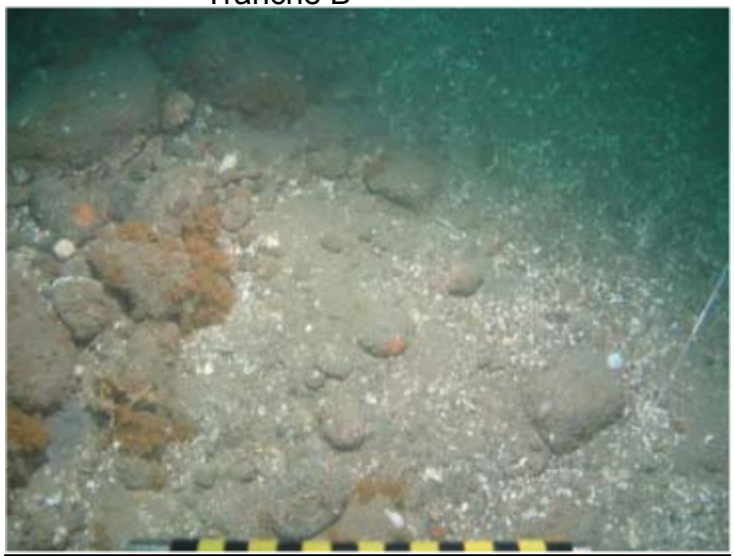
Fauna Description:
Fix796: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis, Asterias rubens*, Other - Cnidaria - *Alcyonium* sp.

Fix806: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Other – Cnidaria - *Alcyonium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 640 **E:** 502521 **N:** 6112647 **Depth:** 32



Fix: 645 **E:** 502514 **N:** 6112685 **Depth:** 30

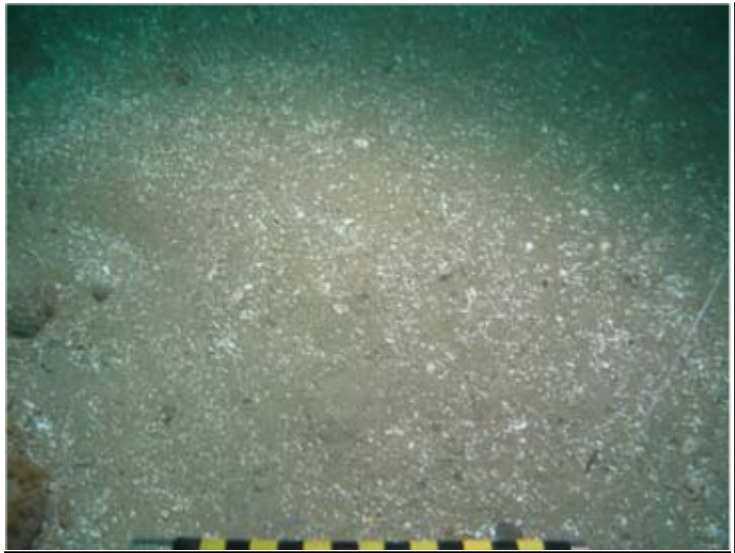
Station: TB_TRAN_07
Sediment Description:
Fix640: Fine sand and gravel with cobbles, boulders and shell fragments

Fix645: Fine sand and gravel with cobbles, boulders and shell hash

Fauna Description:
Fix640: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Asteroidea, Mollusca - Gastropoda, Other - Bryozoa - *Bugula* sp., *Flustra foliacea*

Fix645: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Pagurus* sp., Other - Bryozoa (*Bugula* sp., *Flustra foliacea*, Chordata (Gobiidae), Porifera

Fix: 648 **E:** 502518 **N:** 6112700 **Depth:** 31



Fix: 657 **E:** 502508 **N:** 6112732 **Depth:** 31

Station: TB_TRAN_07
Sediment Description:
Fix648: Fine sand and gravel with cobbles, boulders and shell fragments

Fix657: Fine sand with occasional gravel, cobbles and shell hash

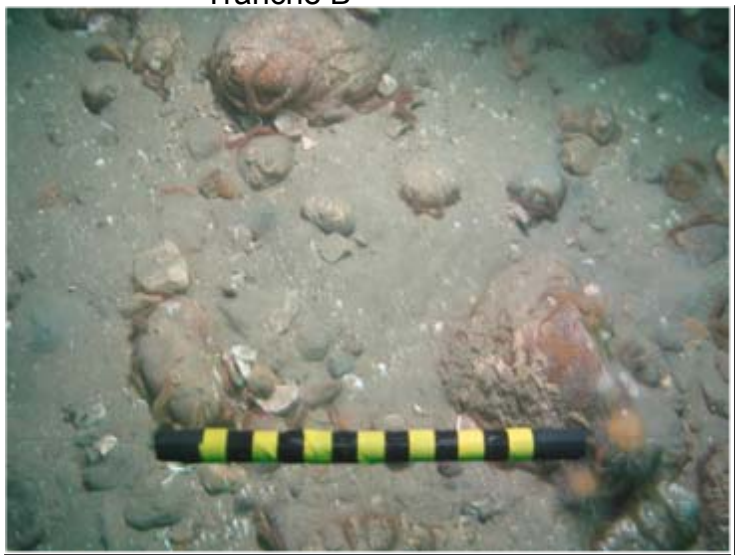
Fauna Description:
Fix648: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Galatheidae, Echinodermata - *Asterias rubens*, Asteroidea, Other - Bryozoa - *Bugula* sp., Cnidaria - *Alcyonium* sp., Hydrozoa, Porifera, Urochordata - Ascidiacea

Fix657: Other - Bryozoa - *Bugula* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B

Fix: 659 **E:** 496414 **N:** 6093505 **Depth:** 30



Fix: 682 **E:** 496627 **N:** 6093626 **Depth:** 33

Station: TB_TRAN_08
Sediment Description:
Fix659: Fine to coarse sand with gravel and shell fragments

Fix682: Gravel with some medium to coarse sand, shell fragments and occasional boulders

Fauna Description:
Fix659: Annelida (Polychaeta) - Polychaete tubes

Fix682: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis,* Psammechinus sp., Other - Cnidaria - Hydrozoa, *Alcyonium* sp., Porifera

Fix: 687 **E:** 496657 **N:** 6093653 **Depth:** 32

Fix: 694 **E:** 496685 **N:** 6093678 **Depth:** 32

Station: TB_TRAN_08
Sediment Description:
Fix687: Fine to coarse sand with gravel, cobbles and shell fragments

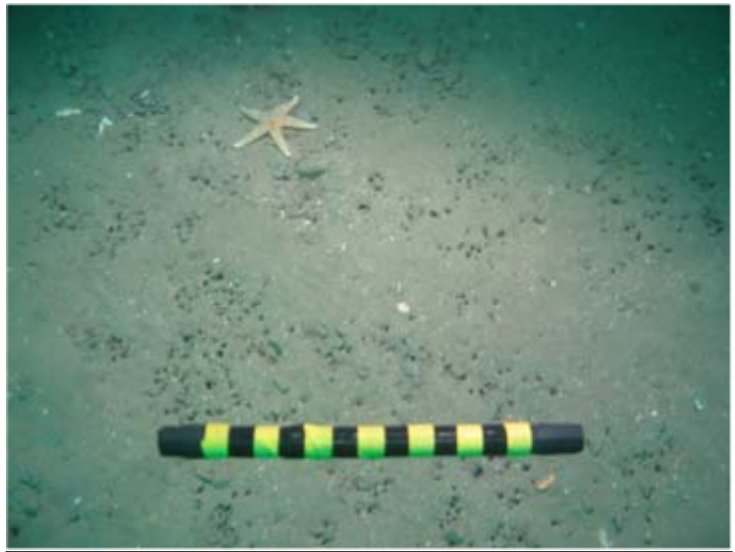
Fix694: Fine to coarse sand with shell fragments

Fauna Description:
Fix687: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Paguridae, Echinodermata - *Ophiothrix fragilis,* Psammechinus sp., Cnidaria - *Alcyonium* sp.

Fix694: Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Tranche B



Fix: 697 **E:** 465355 **N:** 6094367 **Depth:** 30

Fix: 704 **E:** 465319 **N:** 6094325 **Depth:** 30

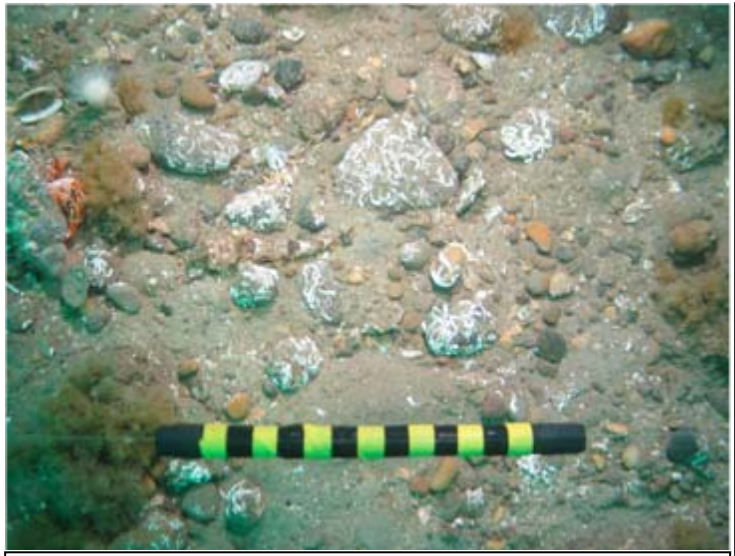
Station: TB_TRAN_09
Sediment Description:
Fix697: Fine sand with gravel and shell fragments

Fix704: Fine sand with shell fragments and occasional gravel

Fauna Description:
Fix697: Echinodermata - *Asterias rubens*

Fix704: Annelida (Polychaeta) - Polychaete tubes

Fix: 728 **E:** 465237 **N:** 6094248 **Depth:** 29



Fix: 731 **E:** 465230 **N:** 6094240 **Depth:** 29

Station: TB_TRAN_09
Sediment Description:
Fix728: Gravel, cobbles and boulders with silty veneer

Fix731: Fine sand and gravel with cobbles and shell fragments

Fauna Description:
Fix728: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Pagurus* sp., Echinodermata - *Ophiothrix fragilis*, Ophiuroidea, Other - Bryozoa - *Bugula* sp., Cnidaria (Hydrozoa)

Fix731: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Pagurus* sp., Other – Bryozoa - *Bugula* sp., Chordata - *Callionymus lyra,* Cnidaria - *Alcyonium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 17 **E:** 239998 **N:** 6059528 **Depth:** 7m

Fix: 22 **E:** 240000 **N:** 6059528 **Depth:** 7m

Station: TCC_01
Sediment Description:
Fix17: Sand with ripples and shell fragments

Fix22: Sand with ripples

Fauna Description:
Fix17: No visible fauna

Fix22: No visible fauna

Fix: 9 **E:** 240022 **N:** 6059551 **Depth:** 7m

Fix: 9 **E:** 240022 **N:** 6059551 **Retention:** MF

Station: TCC_01
Sediment Description:
Grab: Sand

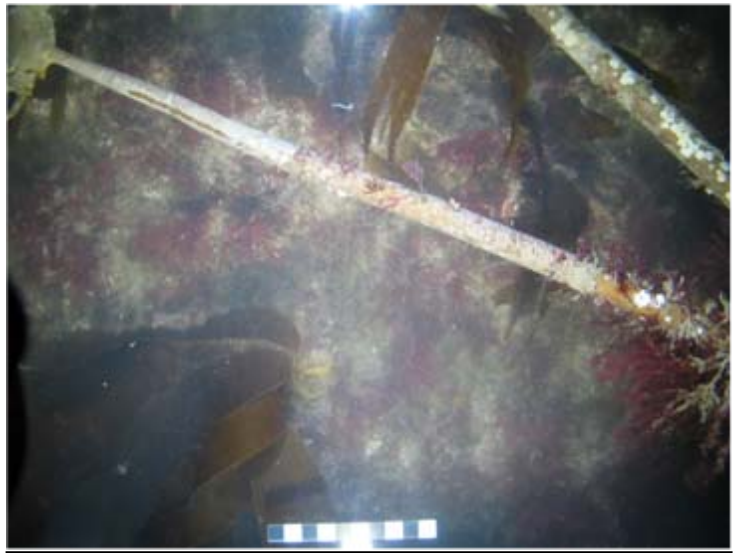
Sieve: Some shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Echinodermata - Echinoidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 28 **E:** 240262 **N:** 6059187 **Depth:** 4m

Fix: 33 **E:** 240263 **N:** 6059188 **Depth:** 4m

Station: TCC_02
Sediment Description:
Fix28: Bedrock

Fix33: Bedrock

Fauna Description:
Fix28: Arthropoda (Crustacea) - Cirripedia, Other - Bryozoa - encrusting species, Phaeophyceae - Laminariales, Rhodophyta - Corallinales, Florideophycea

Fix33: Arthropoda (Crustacea) - Cirripedia, Other - Phaeophyceae - Laminariales, Rhodophyta - Corallinales, Florideophyceae

Fix: 38 **E:** 240263 **N:** 6059189 **Depth:** 4m

Fix: 47 **E:** 240263 **N:** 6059185 **Depth:** 4m

Station: TCC_02
Sediment Description:
Fix38: Bedrock

Fix47: Bedrock

Fauna Description:
Fix38: Arthropoda (Crustacea) - Cirripedia, Other - Bryozoa - encrusting species, Phaeophyceae - Laminariales, Rhodophyta - Corallinales, Florideophyceae

Fix47: Arthropoda (Crustacea) - Cirripedia, Other - Phaeophyceae - Laminariales, Rhodophyta - Corallinales, Florideophyceae

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 2 **E:** 240544 **N:** 6060119 **Depth:** 9m

Fix: 9 **E:** 240560 **N:** 6060120 **Depth:** 9m

Station: TCC_03
Sediment Description:
Fix2: Sand with ripples

Fix9: Sand with ripples

Fauna Description:
Fix2: No visible fauna

Fix9: No visible fauna

Fix: 8 **E:** 240582 **N:** 6060140 **Depth:** 9m

Fix: 8 **E:** 240582 **N:** 6060140 **Retention:** MF

Station: TCC_03
Sediment Description:
Grab: Silty fine sand

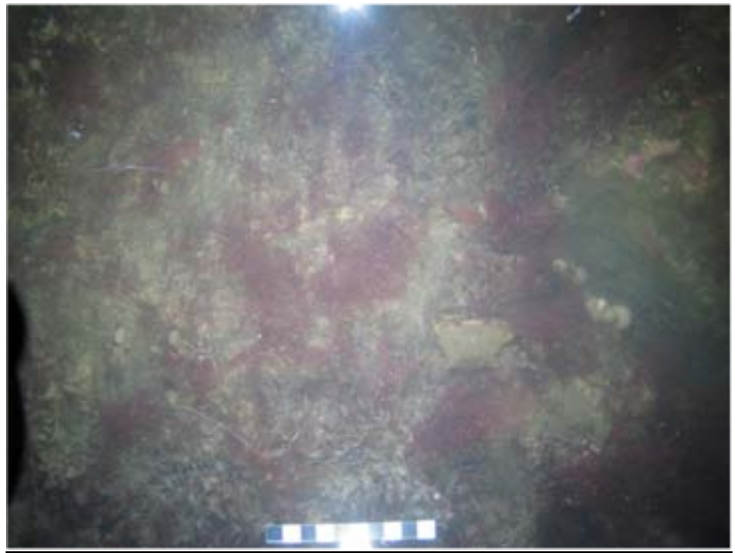
Sieve: Some shell fragments

Fauna Description:
Grab: No visible fauna

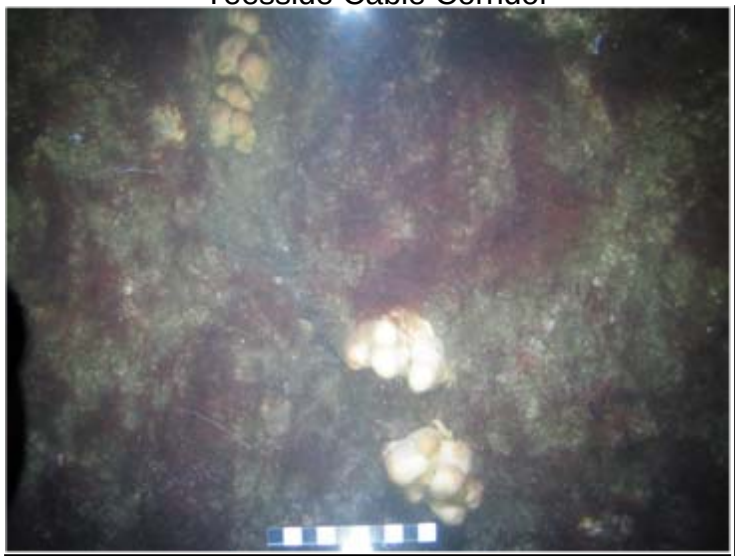
Sieve: Annelida (Polychaeta), Echinodermata - Echinoidea juv.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 49 **E:** 241165 **N:** 6059850 **Depth:** 6m



Fix: 50 **E:** 241165 **N:** 6059849 **Depth:** 6m

Station: TCC_04
Sediment Description:
Fix49: Bedrock

Fix50: Bedrock

Fauna Description:
Fix49: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - *Necora puber*, Other - Bryozoa - Flustra foliacea, Cnidaria - *Alcyonium* sp., Rhodophyta - Corallinales, Florideophyceae

Fix50: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Cirripedia, Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Alcyonium* sp., Rhodophyta - Corallinales, Florideophyceae

Fix: 55 **E:** 241160 **N:** 6059834 **Depth:** 10m

Fix: 62 **E:** 241157 **N:** 6059831 **Depth:** 11m

Station: TCC_04
Sediment Description:
Fix55: Bedrock with boulders

Fix62: Bedrock

Fauna Description:
Fix55: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Cirripedia, Cnidaria - Hydrozoa, Rhodophyta - Corallinales

Fix62: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Cirripedia, Cnidaria - *Alcyonium* sp., Actiniaria

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 64 **E:** 241197 **N:** 6060511 **Depth:** 15m

Fix: 72 **E:** 241196 **N:** 6060509 **Depth:** 15m

Station: TCC_05
Sediment Description:
Fix64: Sand with ripples

Fix72: Sand with ripples

Fauna Description:
Fix64: No visible fauna

Fix72: Arthropoda (Crustacea) - Caridea

Fix: 7 **E:** 241188 **N:** 6060557 **Depth:** 15m

Fix: 7 **E:** 241188 **N:** 6060557 **Retention:** MF

Station: TCC_05
Sediment Description:
Grab: Silty fine sand

Sieve: Shell fragments

Fauna Description:
Grab: Annelida (Polychaeta)

Sieve: Annelida (Polychaeta), Echinodermata - Echinoidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 73 **E:** 242137 **N:** 6060914 **Depth:** 24m

Fix: 84 **E:** 242143 **N:** 6060911 **Depth:** 24m

Station: TCC_06
Sediment Description:
Fix73: Sand with ripples

Fix84: Sand with ripples

Fauna Description:
Fix73: No visible fauna

Fix84: No visible fauna

Fix: 6 **E:** 242133 **N:** 6060915 **Depth:** 24m

Fix: 6 **E:** 242133 **N:** 6060915 **Retention:** MF

Station: TCC_06
Sediment Description:
Grab: Silty fine sand

Sieve: Shell and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Echinodermata - Ophiuroidea, Echinoidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 85 **E:** 242360 **N:** 6061641 **Depth:** 26m

Fix: 92 **E:** 242357 **N:** 6061637 **Depth:** 26m

Station: TCC_07
Sediment Description:
Fix85: Bedrock and boulders with silty sand

Fix92: Silty sand with boulders

Fauna Description:
Fix85: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Other - Cnidaria - *Alcyonium* sp.

Fix92: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Echinodermata - Ophiuroidea, Other - Bryozoa - *Flustra foliacea*

Fix: 96 **E:** 242369 **N:** 6061634 **Depth:** 25m

Fix: 99 **E:** 242369 **N:** 6061632 **Depth:** 24m

Station: TCC_07
Sediment Description:
Fix96: Silty sand with cobbles

Fix99: Silty sand with cobbles

Fauna Description:
Fix96: Arthropoda (Polychaeta) - Caridea, Echinodermata - Ophiuroidea, Other - Bryozoa - *Flustra foliacea*

Fix99: Arthropoda (Crustacea) - Caridea, Other - Bryozoa - *Flustra foliacea*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 103 **E:** 243709 **N:** 6062289 **Depth:** 31m

Fix: 105 **E:** 243711 **N:** 6062289 **Depth:** 31m

Station: TCC_08
Sediment Description:
Fix103: Bedrock and boulders with silty sand

Fix105: Bedrock and boulders with silty sand

Fauna Description:
Fix103: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Other - Cnidaria - *Alcyonium* sp.

Fix105: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Echinodermata - Ophiuroidea, Other - Cnidaria - *Alcyonium* sp.

Fix: 107 **E:** 243712 **N:** 6062288 **Depth:** 31m

Fix: 109 **E:** 243713 **N:** 6062286 **Depth:** 31m

Station: TCC_08
Sediment Description:
Fix107: Bedrock and boulders with silty sand

Fix109: Bedrock and boulders with silty sand

Fauna Description:
Fix107: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Munida* sp., Other - Cnidaria - *Alcyonium* sp.

Fix109: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Caridea* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 110 **E:** 244082 **N:** 6062588 **Depth:** 34m

Fix: 119 **E:** 244086 **N:** 6062583 **Depth:** 34m

Station: TCC_09
Sediment Description:
Fix110: Silty sand with ripples

Fix119: Silty sand with ripples

Fauna Description:
Fix110: No visible fauna

Fix119: No visible fauna

Fix: 22 **E:** 244037 **N:** 6062599 **Depth:** 34m

Fix: 22 **E:** 244037 **N:** 6062599 **Retention:** MF

Station: TCC_09
Sediment Description:
Grab: Sandy silt

Sieve: Shell and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Echinodermata - Echinoidea, Ophiuroidea, Other – Chordata - Platyhelminthes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 163 **E:** 245633 **N:** 6064837 **Depth:** 42m

Fix: 169 **E:** 245634 **N:** 6064840 **Depth:** 42m

Station: TCC_10
Sediment Description:
Fix163: Sand with ripples

Fix169: Sand with ripples

Fauna Description:
Fix163: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Paguridae, Caridea

Fix169: Arthropoda (Crustacea) - Caridea

Fix: 5 **E:** 245632 **N:** 6064827 **Depth:** 42m

Fix: 5 **E:** 245632 **N:** 6064827 **Retention:** MF

Station: TCC_10
Sediment Description:
Grab: Silty fine sand

Sieve: Shells and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaeta, Polychaete tubes, Mollusca - Scaphopoda, Gastropoda, Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 120 **E:** 249720 **N:** 6066256 **Depth:** 46m

Fix: 121 **E:** 249722 **N:** 6066252 **Depth:** 46m

Station: TCC_11
Sediment Description:
Fix120: Silty gravelly sand

Fix121: Silty gravelly sand

Fauna Description:
Fix120: Arthropoda (Crustacea) - *Munida* sp., Caridea, Other - Bryozoa - *Flustra foliacea*, Cnidara - Hydrozoa

Fix121: Other - Cnidaria - Hydrozoa

Fix: 124 **E:** 249720 **N:** 6066249 **Depth:** 46m

Fix: 127 **E:** 249722 **N:** 6066245 **Depth:** 46m

Station: TCC_11
Sediment Description:
Fix124: Boulders with gravelly sand

Fix127: Silty gravelly sand

Fauna Description:
Fix124: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Munida* sp., Echinodermata - Ophiurae, Other - Bryozoa - *Flustra foliacea*, Cnidaria - Hydrozoa

Fix127: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca – Scaphopoda, Other - Bryozoa - *Flustra foliacea*,

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 130 **E:** 250328 **N:** 6067625 **Depth:** 47m

Fix: 135 **E:** 250343 **N:** 6067623 **Depth:** 47m

Station: TCC_12
Sediment Description:
Fix130: Gravelly sand

Fix135: Gravelly sand

Fauna Description:
Fix130: Arthropoda (Crustacea) - Caridea

Fix135: Arthropoda (Crustacea) - Caridea, *Inachus* sp., Mollusca - Scaphopoda, Other - Cnideria - Hydrozoa

Fix: 4 **E:** 250321 **N:** 6067675 **Depth:** 48m

Fix: 4 **E:** 250321 **N:** 6067675 **Retention:** MF

Station: TCC_12
Sediment Description:
Grab: Silty gravelly sand

Sieve: Shell and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Echinodermata - Ophuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 140 **E:** 250473 **N:** 6067992 **Depth:** 47m

Fix: 143 **E:** 250479 **N:** 6067994 **Depth:** 47m

Station: TCC_13
Sediment Description:
Fix140: Silty sandy gravel

Fix143: Gravelly sand with boulders

Fauna Description:
Fix140: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crsutacea) - Caridea, Echinodermata - Ophiuroidea, Other - Cnidaria - Hydrozoa

Fix143: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Other - Cnidaria - Sertulariidae, Hydrozoa

Fix: 146 **E:** 250479 **N:** 6067992 **Depth:** 47m

Fix: 147 **E:** 250477 **N:** 6067992 **Depth:** 47m

Station: TCC_13
Sediment Description:
Fix146: Silty sandy gravel

Fix147: Silty sandy gravel

Fauna Description:
Fix146: Arthropoda (Crustacea) - Caridea, Mollusca - Scaphopoda

Fix147: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Inachus* sp., Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 150 **E:** 252835 **N:** 6069098 **Depth:** 50m

Fix: 154 **E:** 252836 **N:** 6069099 **Depth:** 50m

Station: TCC_14
Sediment Description:
Fix150: Gravelly sand with cobbles

Fix154: Boulders

Fauna Description:
Fix150: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Other - Bryozoa - *Flustra foliacea*, Cnidaria - Sertulariidae, Hydrozoa

Fix154: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Gastropoda, Echinodermata - *Ophiothrix fragilis*, Ophiurae, Other - Cnidaria - Hydrozoa, Sertulariidae, Tubulariidae

Fix: 3 **E:** 252816 **N:** 6069091 **Depth:** 50m

Fix: 3 **E:** 252816 **N:** 6069091 **Retention:** MF

Station: TCC_14
Sediment Description:
Grab: Silty gravelly sand

Sieve: Shell, shell fragments, and pebbles

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Echinodermata - Asteroidea, Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 4 **E:** 254815 **N:** 6069875 **Depth:** 52m

Fix: 9 **E:** 254815 **N:** 6069875 **Depth:** 52m

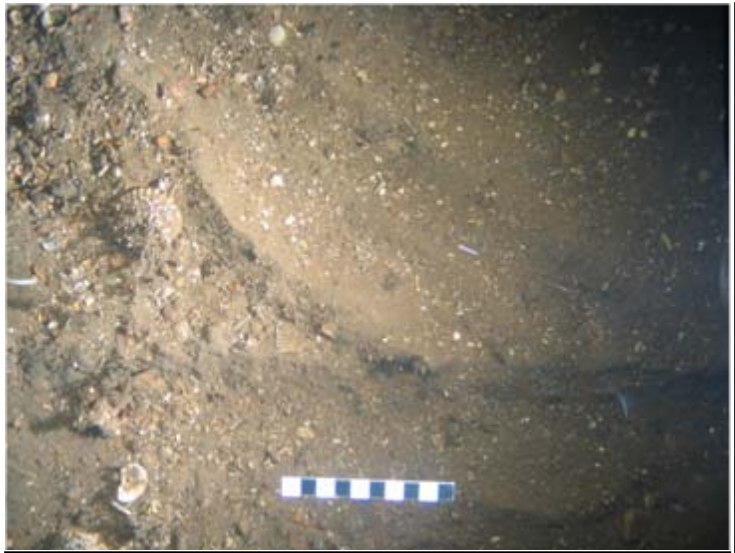
Station: TCC_15
Sediment Description:
Fix4: Fine sand with shell fragments and occasional gravel

Fix9: Fine sand with gravel and shell fragments

Fauna Description:
Fix4: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiura albida*, Other – Bryozoa - *Flustra foliacea*, *Cellaria* sp., Cnidaria - Sertulariidae, Hydrozoa

Fix9: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Asterias rubens*, Other – Cnidaria - Sertulariidae, Hydrozoa

Fix: 7 **E:** 254815 **N:** 6069875 **Depth:** 52m



Fix: 11 **E:** 254815 **N:** 6069875 **Depth:** 52m

Station: TCC_15
Sediment Description:
Fix7: Fine sand with occasional gravel and shell fragments

Fix11: Fine sand with ripples gravel and shell fragments

Fauna Description:
Fix7: Arthropoda (Crustacea) - *Munida* sp., Echinodermata - Ophiuroidea, Other – Cnidaria - Hydrozoa

Fix11: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Scaphopoda, *Aequipecten opercularis*, Echinodermata - *Ophiura albida*, Other - Cnidaria - Sertulariidae, Hydrozoa

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 16 **E:** 255578 **N:** 6069213 **Depth:** 52m

Fix: 23 **E:** 255578 **N:** 6069213 **Depth:** 52m

Station: TCC_16
Sediment Description:
Fix16: Fine sand with shell fragments and occasional gravel

Fix23: Fine sand with gravel and shell fragments

Fauna Description:
Fix16: Annelida (Polychaeta) - *Spirobranchus* sp., polychaeta tubes, Arthropoda (Crustacea) - Caridea, Echinodermata - *Ophiura albida*, Ophiurae, Other - Cnideria - Alcyonium sp.

Fix23: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Scaphopoda, Echinodermata - Ophiuroidea, Other - Cnidaria - *Thiaria thuja*, Hydrozoa

Fix: 13 **E:** 255552 **N:** 6069234 **Depth:** 52m

Fix: 13 **E:** 255552 **N:** 6069234 **Retention:** MF

Station: TCC_16
Sediment Description:
Grab: Fine to medium sand with shell fragments, pebbles and gravel

Sieve: Shell fragments, gravel and some pebbles

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Scaphopoda

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 30 **E:** 256621 **N:** 6069635 **Depth:** 52m

Fix: 33 **E:** 256621 **N:** 6069635 **Depth:** 52m

Station: TCC_17
Sediment Description:
Fix30: Fine sand and bedrock with gravel and shell fragments

Fix33: Fine sand with bedrock, occasional boulders and shell fragments

Fauna Description:
Fix30: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Munida* sp., Other - Bryozoa - *Flustra foliacea*, Cnidaria - Sertulariidae, Hydrozoa

Fix33: Arthropoda (Crustacea) - Majidae, Paguridae, Echinodermata - Echinoidea, Ophiuroidea, Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Abietinaria* sp., *Hydrallmania* sp.

Fix: 26 **E:** 256621 **N:** 6069635 **Depth:** 52m

Fix: 37 **E:** 256621 **N:** 6069635 **Depth:** 52m

Station: TCC_17
Sediment Description:
Fix26: Fine sand with occasional gravel and shell fragments

Fix37: Fine sand with occasional shell fragments

Fauna Description:
Fix26: Mollusca - Scaphopoda, Echinodermata - Asteroidea

Fix37: Arthropoda (Crustacea) - Leucosiidae, Other - Bryozoa - *Cellaria* sp., *Flustra foliacea*, Cnidaria - Sertulariidae, *Hydrallmania* sp., *Thiaria thuja*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 66 **E:** 258827 **N:** 6071741 **Depth:** 56m

Fix: 73 **E:** 258827 **N:** 6071741 **Depth:** 56m

Station: TCC_18
Sediment Description:
Fix66: Fine sand with shells and shell fragments

Fix73: Fine sand with gravel and shell fragments

Fauna Description:
Fix66: Annelida (Polychaeta) - *Spirobranchus* sp.

Fix73: Other - Cnidaria - Hydrozoa

Fix: 1 **E:** 258800 **N:** 6071733 **Depth:** 56m

Fix: 1 **E:** 258800 **N:** 6071733 **Retention:** MF

Station: TCC_18
Sediment Description:
Grab: Fine sand with some shell fragments and shells

Sieve: Shell and shell fragments with some pebbles

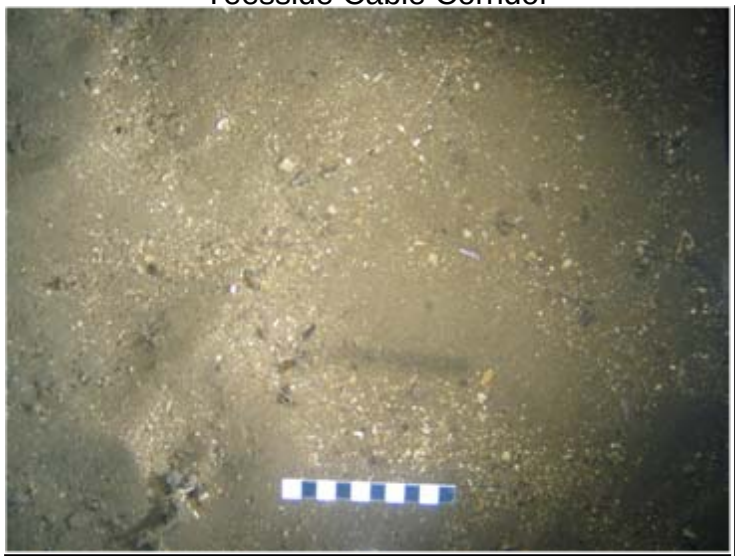
Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Paguridae), Mollusca - Scaphapoda shells

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 41 **E:** 258887 **N:** 6070718 **Depth:** 56m



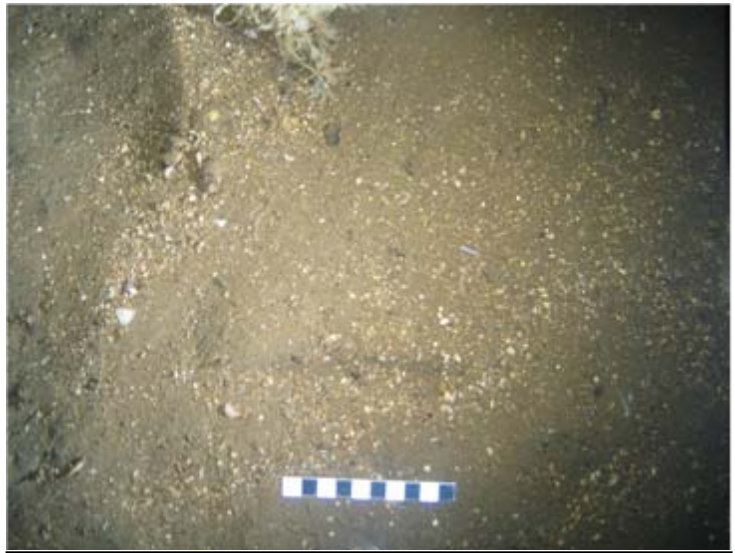
Fix: 59 **E:** 258887 **N:** 6070718 **Depth:** 56m

Station: TCC_19
Sediment Description:
Fix41: Fine sand and gravel with shell fragments

Fix59: Fine sand with ripples and gravel and shell fragments

Fauna Description:
Fix41: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Scaphopoda

Fix59: Annelida (Polychaeta) - Polychaeta tubes, Other - Cnidaria - Hydrozoa



Fix: 43 **E:** 258887 **N:** 6070718 **Depth:** 56m

Fix: 49 **E:** 258887 **N:** 6070718 **Depth:** 56m

Station: TCC_19
Sediment Description:
Fix43: Fine sand and gravel with shell fragments

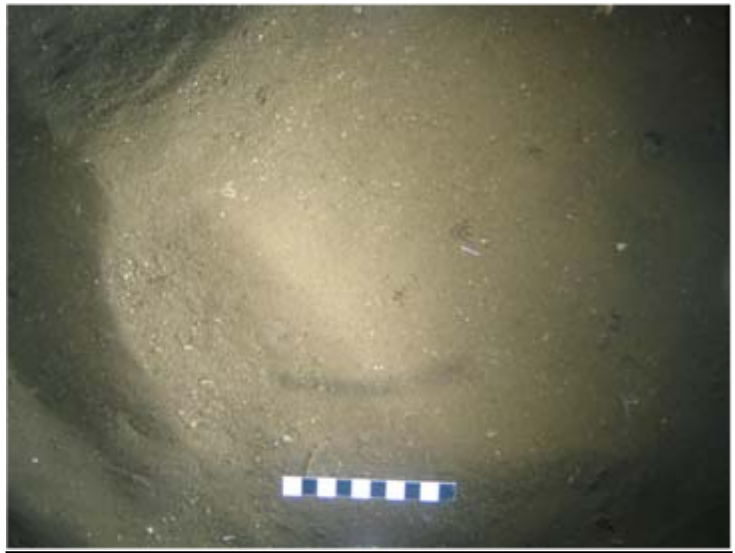
Fix49: Fine sand and gravel with shell fragments

Fauna Description:
Fix43: Annelida (Polychaeta) - *Spirobranchus* sp., Other - Bryozoa - *Flustra foliacea*

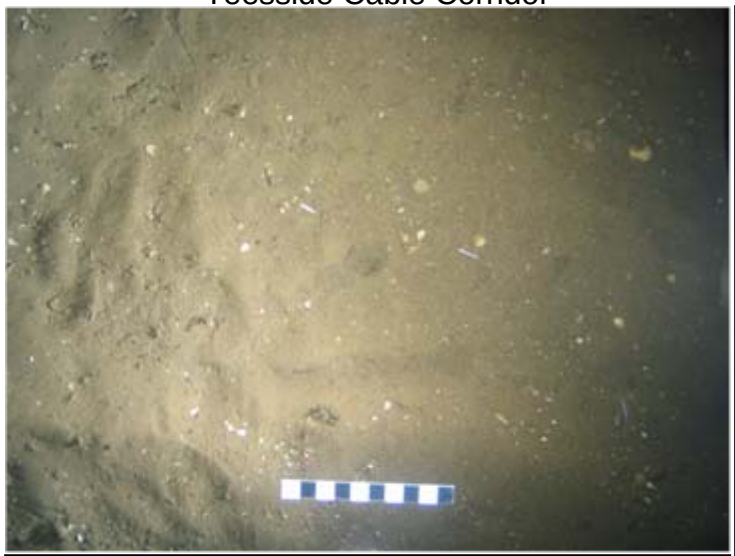
Fix49: Annelida (Polychaeta) - *Spirobranchus* sp., Mollusca - Scaphopoda, Other - Cnidaria - Hydrozoa

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 79 **E:** 265547 **N:** 6074991 **Depth:** 57m



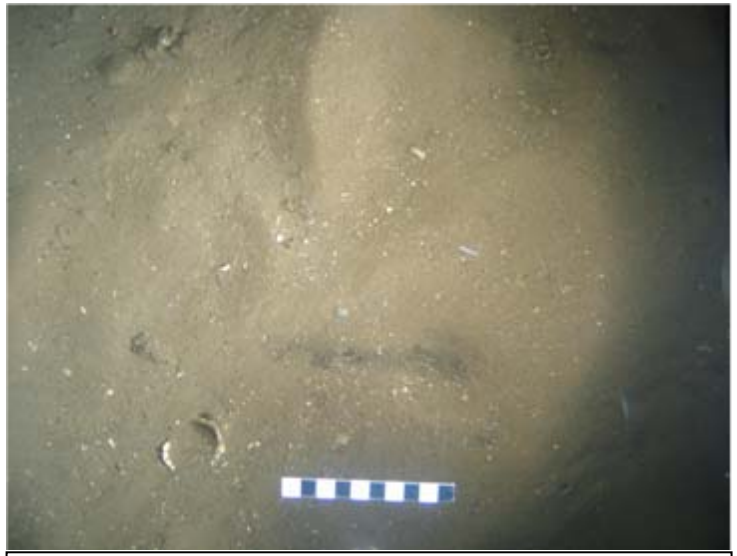
Fix: 85 **E:** 265547 **N:** 6074991 **Depth:** 57m

Station: TCC_20
Sediment Description:
Fix79: Fine sand with ripples and shell fragments

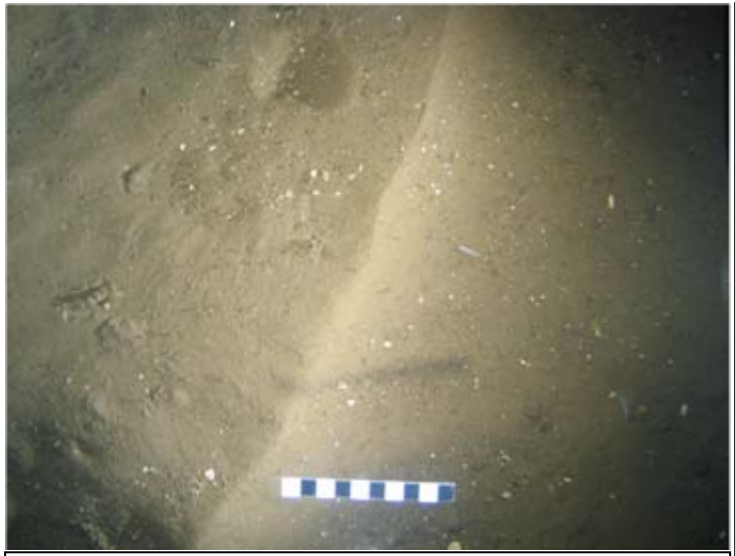
Fix85: Fine sand with ripples and shell fragments

Fauna Description:
Fix79: No visible fauna

Fix85: Annelida (Polycheta) - Polychaete tubes, Other - Cnidaria - Hydrozoa



Fix: 81 **E:** 265547 **N:** 6074991 **Depth:** 57m



Fix: 83 **E:** 265547 **N:** 6074991 **Depth:** 57m

Station: TCC_20
Sediment Description:
Fix81: Fine sand with ripples and shell fragments

Fix83: Fine sand with ripples and shell fragments

Fauna Description:
Fix81: Mollusca - Bivalvia

Fix83: Annelida (Polycheta) - Polychaete tubes, Other - Cnidaria - Hydrozoa

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 88 **E:** 266109 **N:** 6074108 **Depth:** 56m

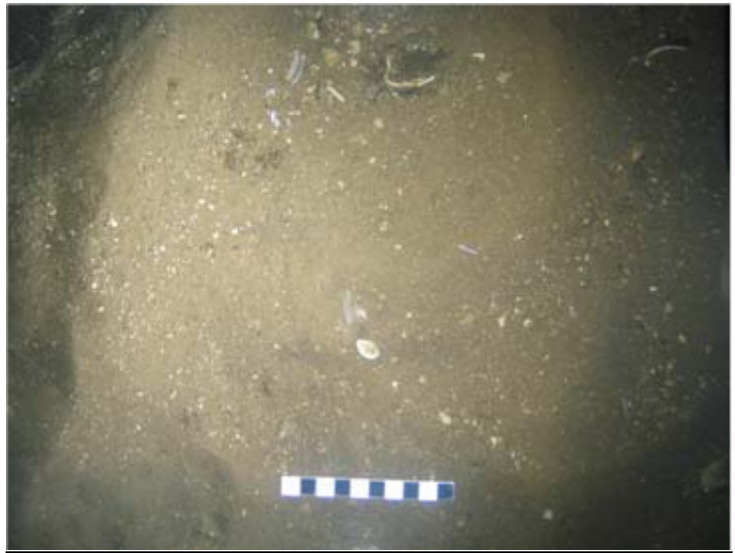
Fix: 99 **E:** 266109 **N:** 6074108 **Depth:** 56m

Station: TCC_21
Sediment Description:
Fix88: Fine sand with ripples and shell fragments

Fix99: Fine sand and boulders with occasional shell fragments

Fauna Description:
Fix88: Other - Cnidaria - Hydrozoa

Fix99: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Ophiurae, Other - Cnidaria - Sertulariidae, *Hydrallmania* sp.,*Abietinaria* sp.



Fix: 98 **E:** 266109 **N:** 6074108 **Depth:** 56m

Fix: 102 **E:** 266109 **N:** 6074108 **Depth:** 56m

Station: TCC_21
Sediment Description:
Fix98: Fine sand with ripples and shell fragments

Fix102: Fine sand with ripples and shell fragments

Fauna Description:
Fix98: Other - Cnidaria - Hydrozoa

Fix102: Other - Foraminifera

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 103 **E:** 271585 **N:** 6077859 **Depth:** 60m

Fix: 117 **E:** 271585 **N:** 6077859 **Depth:** 60m

Station: TCC_22
Sediment Description:
Fix103: Fine sand with shell fragments

Fix117: Fine sand with ripples and shell fragments

Fauna Description:
Fix103: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Caridea, Other – Cnidaria - *Virgularia mirabilis*, Hydrozoa, Foraminifera - *Astrorhiza* sp.

Fix117: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Virgularia mirabilis*, Hydrozoa

Fix: 7 **E:** 271565 **N:** 6077896 **Depth:** 60m

Fix: 7 **E:** 271565 **N:** 6077896 **Retention:** MF

Station: TCC_22
Sediment Description:
Grab: Fine to medium sand with some small shell fragments

Sieve: Some shell and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Arthropoda (Crustacea) - Isopoda, Mollusca - Bivalvia, Echinodermata - *Echinocardium chordatum*, Ophiuroidae juv.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 118 **E:** 272327 **N:** 6077077 **Depth:** 59m

Fix: 124 **E:** 272327 **N:** 6077077 **Depth:** 59m

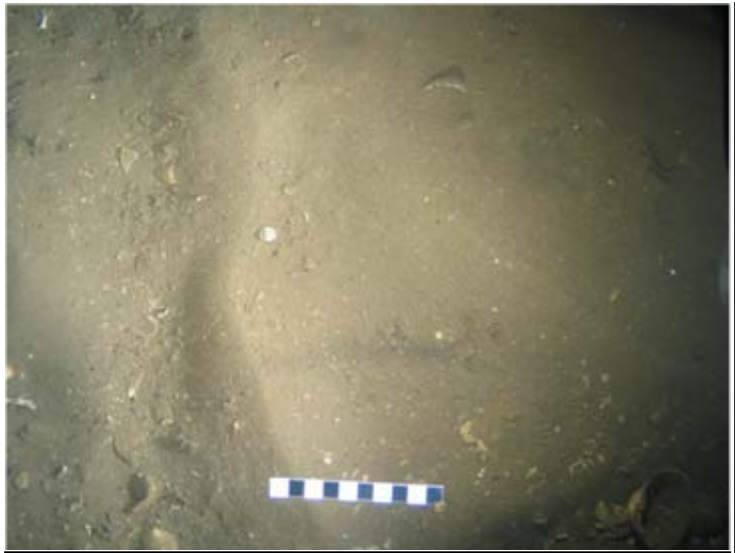
Station: TCC_23
Sediment Description:
Fix118: Fine sand with shell fragments

Fix124: Fine sand and gravel with shell fragments and boulders

Fauna Description:
Fix118: Annelida (Polychaeta) - Polychaeta tubes, Other - Cnidaria - Hydrozoa, Foraminifera - *Astrorhiza* sp

Fix124: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Paguridae, Mollusca - Scaphopoda, Other - Cnidaria - Sertulariidae, *Abietinaria* sp.

Fix: 121 **E:** 272327 **N:** 6077077 **Depth:** 59m



Fix: 127 **E:** 272327 **N:** 6077077 **Depth:** 59m

Station: TCC_23
Sediment Description:
Fix121: Fine sand with gravel and boulders

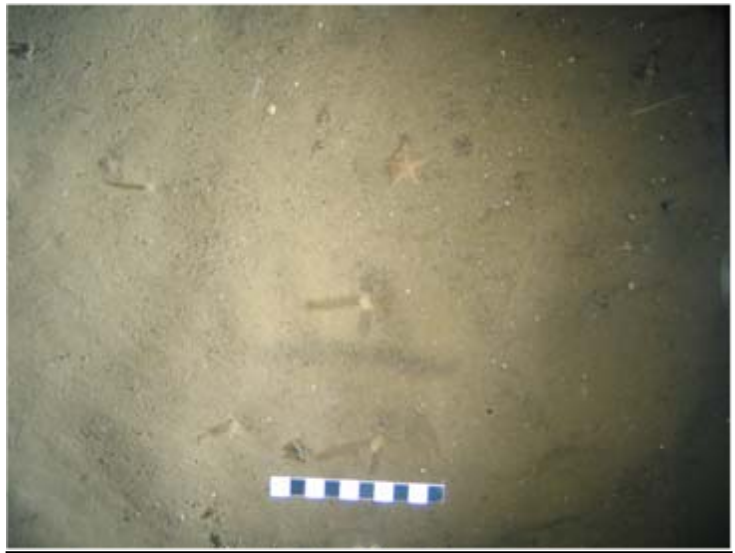
Fix127: Fine sand with ripples and shell fragments

Fauna Description:
Fix121: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Brachyura, Echinodermata - Spatangoida, Other - Cnidaria - *Alcyonium* sp., Tubularia sp.

Fix127: Annelida (Polychaeta) - *Spirobranchus* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 131 **E:** 278285 **N:** 6078722 **Depth:** 61m

Fix: 138 **E:** 278285 **N:** 6078722 **Depth:** 61m

Station: TCC_24
Sediment Description:
Fix131: Fine sand with shell fragments

Fix138: Fine sand with boulders

Fauna Description:
Fix131: Arthropoda (Crustacea) - Caridea, Echinodermata - *Astropecten irregularis*, Other – Cnidaria - *Virgularia mirabilis*

Fix138: Annelida (Polychaeta) - *Spirobranchus* sp., Other - Cnidaria - *Alcyonium* sp., Hydrozoa, Sertulariidae, *Hydrallmania* sp.,*Abietinaria* sp., Porifera

Fix: 4 **E:** 278293 **N:** 6078759 **Depth:** 61m

Fix: 4 **E:** 278293 **N:** 6078759 **Retention:** MF

Station: TCC_24
Sediment Description:
Grab: Fine to medium sand with shell fragments

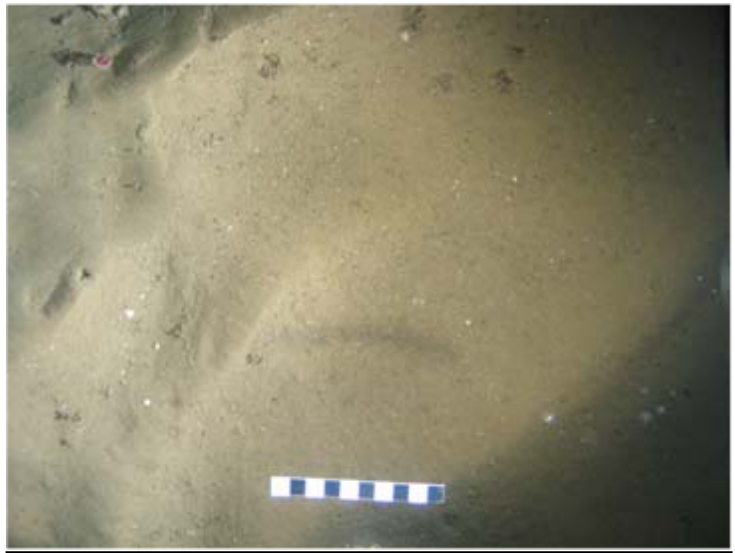
Sieve: Some shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Mollusca - Bivalvia, Echinodermata - Ophiuroidae juv.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 144 **E:** 285987 **N:** 6078481 **Depth:** 63m

Fix: 146 **E:** 285987 **N:** 6078481 **Depth:** 63m

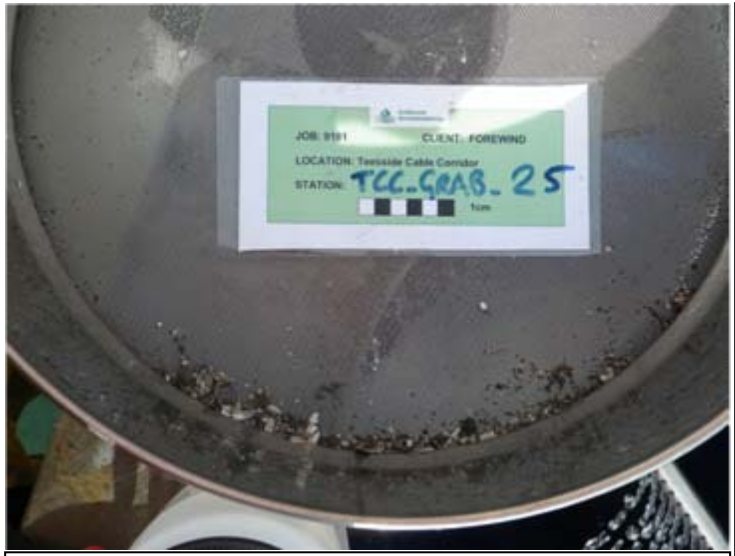
Station: TCC_25
Sediment Description:
Fix144: Fine sand with ripples and shell fragments

Fix146: Fine sand with ripples and shell fragments

Fauna Description:
Fix144: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - *Ebalia* sp., Other – Cnidaria - *Pennatula phosphorea*

Fix146: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix: 15 **E:** 285987 **N:** 6078481 **Depth:** 63m



Fix: 15 **E:** 285987 **N:** 6078481 **Retention:** MF

Station: TCC_25
Sediment Description:
Grab: Sand with shell fragments

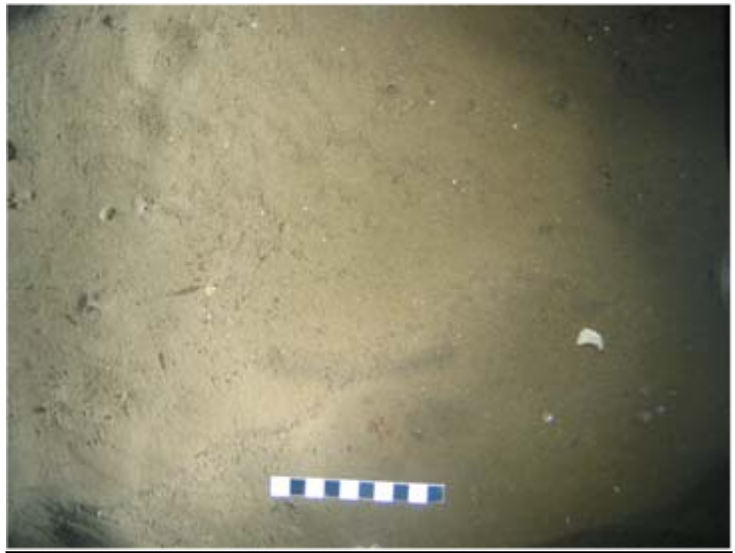
Sieve: Some shell fragments

Fauna Description:
Grab: No fauna visible

Sieve: Annelida (Polychaeta)

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 169 **E:** 286248 **N:** 6077558 **Depth:** 63m

Fix: 172 **E:** 286248 **N:** 6077558 **Depth:** 63m

Station: TCC_26
Sediment Description:
Fix169: Fine sand with ripples and shell fragments

Fix172: Fine sand with ripples and shell fragments

Fauna Description:
Fix169: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*, Foraminifera - *Astrorhiza* sp.

Fix172: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Caridae, Echinodermata - Ophiuroidea, Other - Cnidaria - *Alcyonium* sp., Hydrozoa, Foraminifera - *Astrorhiza* sp.

Fix: 14 **E:** 286248 **N:** 6077558 **Depth:** 63m

Fix: 14 **E:** 286248 **N:** 6077558 **Retention:** MF

Station: TCC_26
Sediment Description:
Grab: Sand with shell fragments

Sieve: Some shell fragments

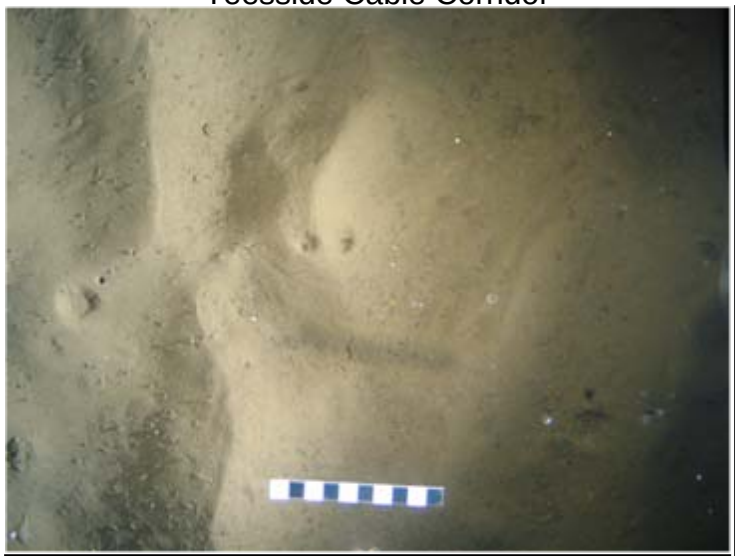
Fauna Description:
Grab: No fauna visible

Sieve: Annelida (Polychaeta), Echinodermata - Asteroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 178 **E:** 290641 **N:** 6078722 **Depth:** 65m



Fix: 187 **E:** 290641 **N:** 6078722 **Depth:** 65m

Station: TCC_27
Sediment Description:
Fix178: Fine sand with ripples and shell fragments

Fix187: Fine sand with ripples and shell fragments

Fauna Description:
Fix178: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Paguridae, Other - Cnidaria - *Pennatula phosphorea*

Fix187: Annelida (Polychaeta) - Polychaete tubes, Other - Bryozoa, Chordata - Platyhelminthes, Cnidaria - *Pennatula phosphorea*

Fix: 13 **E:** 290641 **N:** 6078722 **Depth:** 65m

Fix: 13 **E:** 290641 **N:** 6078722 **Retention:** MF

Station: TCC_27
Sediment Description:
Grab: Sand with shell fragments

Sieve: Some shell fragments

Fauna Description:
Grab: No fauna visible

Sieve: Annelida (Polychaeta), Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 191 **E:** 293685 **N:** 6080680 **Depth:** 72m

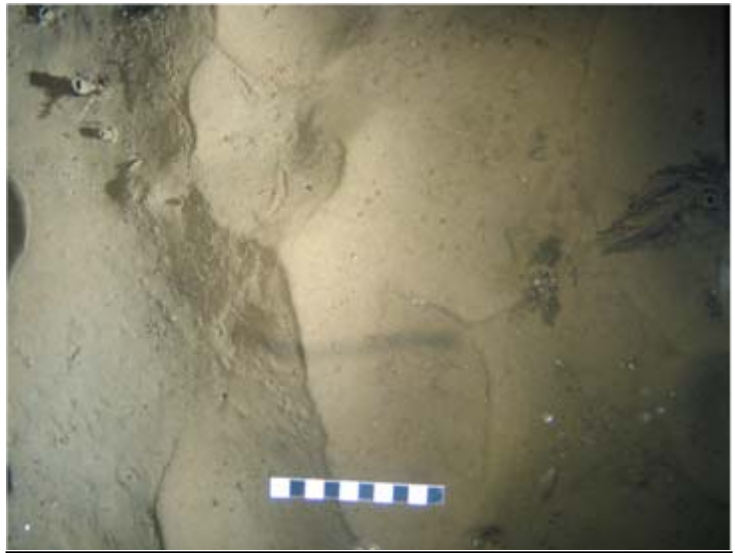
Fix: 192 **E:** 293690 **N:** 6080667 **Depth:** 72m

Station: TCC_28
Sediment Description:
Fix191: Fine sand with ripples and shell fragments

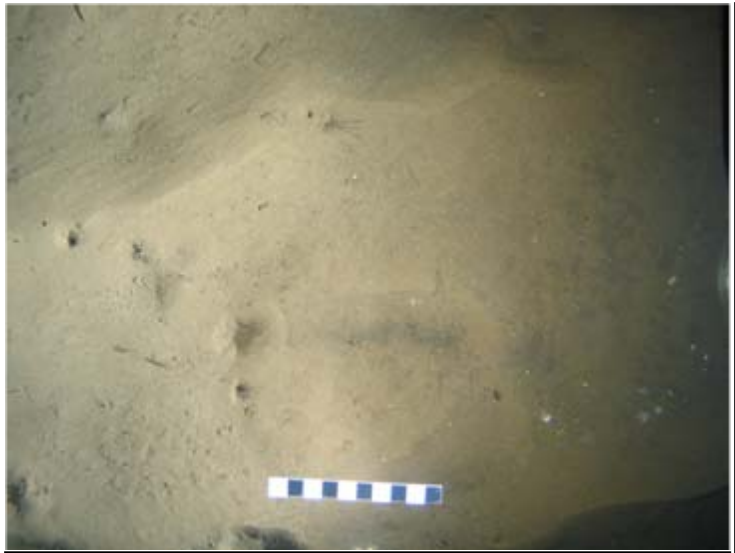
Fix192: Fine sand with ripples and shell fragments

Fauna Description:
Fix191: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - *Ebalia* sp., Echinodermata - Ophiuroidea, Other - Cnidaria - *Pennatula phosphorea*

Fix192: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - Ophiuroidea, Other - Cnidaria - *Pennatula phosphorea*, Foraminifera - *Astrorhiza* sp.



Fix: 193 **E:** 293690 **N:** 6080667 **Depth:** 72m



Fix: 199 **E:** 293690 **N:** 6080667 **Depth:** 72m

Station: TCC_28
Sediment Description:
Fix193: Fine sand with ripples and shell fragments

Fix199: Fine sand with ripples and shell fragments

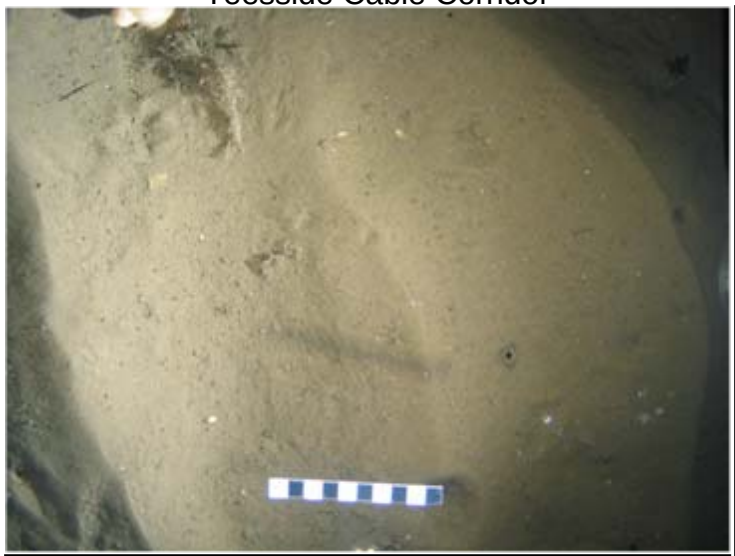
Fauna Description:
Fix193: Annelida (Polychaeta) - Polychaete tubes, Other - Bryozoa - Cnidaria - Hydrozoa, Vesiculariidae, Chordata - Pleuronectidae, Foraminifera - *Astrorhiza* sp.

Fix199: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 201 **E:** 295435 **N:** 6081109 **Depth:** 71m



Fix: 203 **E:** 295435 **N:** 6081109 **Depth:** 71m

Station: TCC_29
Sediment Description:
Fix201: Fine sand with ripples and shell fragments

Fix203: Fine sand with ripples and shell fragments

Fauna Description:
Fix201: Annelida (Polychaeta) - Polychaete tubes, *Spirobranchus* sp., Arthropoda (Crustacea) - Paguridae, Other - Cnidaria - *Pennatula phosphorea*

Fix203: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Alcyonium* sp., Hydrozoa, Foraminifera - *Astrorhiza* sp.

Fix: 10 **E:** 295435 **N:** 6081109 **Depth:** 71m

Fix: 10 **E:** 295435 **N:** 6081109 **Retention:** MF

Station: TCC_29
Sediment Description:
Grab: Sand with shell fragments

Sieve: Some shell fragments

Fauna Description:
Grab: No fauna visible

Sieve: Annelida (Polychaeta), Echinodermata - *Echinocardium* sp., *Astropecten irregularis*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 210 **E:** 297361 **N:** 6080707 **Depth:** 72m

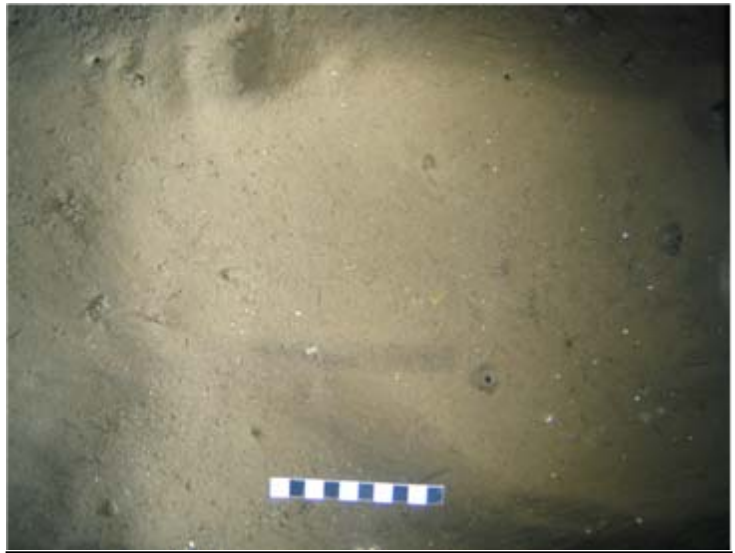
Fix: 216 **E:** 297361 **N:** 6080707 **Depth:** 72m

Station: TCC_30
Sediment Description:
Fix210: Fine sand with ripples and shell fragments

Fix216: Fine sand with ripples and shell fragments

Fauna Description:
Fix210: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - Ophiuroidea, Other - Cnidaria - *Virgularia mirabilis*, Foraminifera - *Astrorhiza* sp.

Fix216: Annelida (Polychaete tubes), Bryozoa (*Flustra foliacea*), Cnidaria (*Pennatula phosphorea*)



Fix: 219 **E:** 297361 **N:** 6080707 **Depth:** 72m

Fix: 222 **E:** 297361 **N:** 6080707 **Depth:** 72m

Station: TCC_30
Sediment Description:
Fix219: Fine sand with ripples and shell fragments

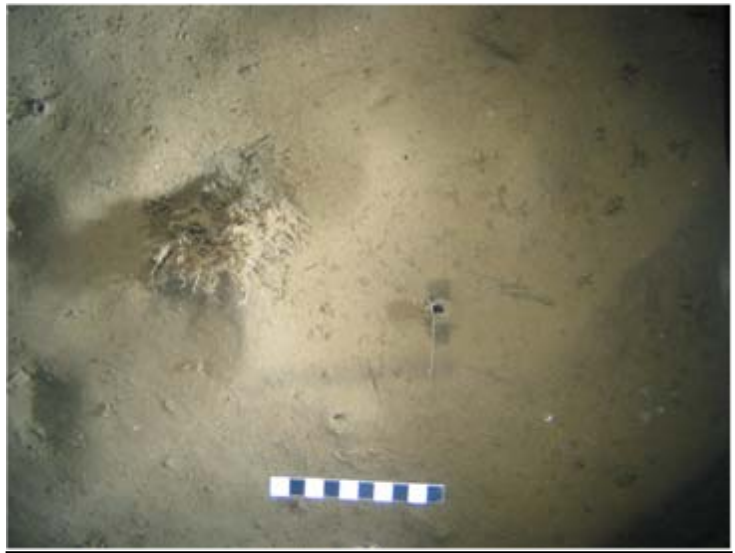
Fix222: Fine sand with ripples and shell fragments

Fauna Description:
Fix219: Annelida (Polychaeta) - Polychaete tubes

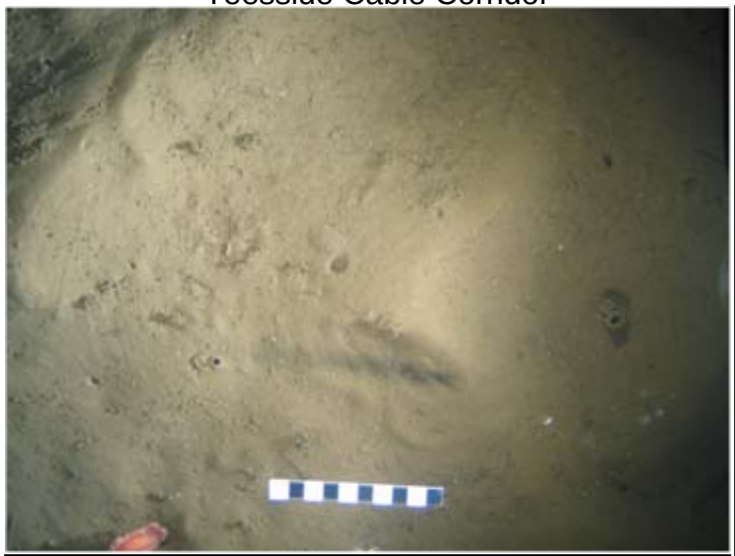
Fix222: Annelida (Polychaeta) - Polychaete tubes, Other - Foraminifera - *Astrorhiza* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 226 **E:** 300671 **N:** 6082352 **Depth:** 81m



Fix: 229 **E:** 300671 **N:** 6082352 **Depth:** 81m

Station: TCC_31
Sediment Description:
Fix226: Fine sand with ripples and shell fragments

Fix229: Fine sand with ripples and shell fragments

Fauna Description:
Fix226: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Caridae, Other – Cnidaria - Sertulariidae, Foraminifera - *Astrorhiza* sp.

Fix229: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*, Foraminifera - *Astrorhiza* sp.

Fix: 8 **E:** 300671 **N:** 6082352 **Depth:** 81m

Fix: 8 **E:** 300671 **N:** 6082352 **Retention:** MF

Station: TCC_31
Sediment Description:
Grab: Sand with shell fragments

Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 248 **E:** 305325 **N:** 6085221 **Depth:** 75m

Fix: 250 **E:** 305325 **N:** 6085221 **Depth:** 75m

Station: TCC_32
Sediment Description:
Fix248: Fine sand with shell fragments

Fix250: Fine sand with shell fragments

Fauna Description:
Fix248: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Caridae, Other – Cnidaria - *Alcyonium* sp., Foraminifera - *Astrorhiza* sp.

Fix250: Annelida (Polychaeta) - Polychaete tubes, *Ophiodromus flexuosus*, Other - Cnidaria - *Pennatula phosphorea*

Fix: 27* **E:** 305325 **N:** 6085221 **Depth:** 75m

Fix: 27 **E:** 305325 **N:** 6085221 **Retention:** MF

Station: TCC_32
Sediment Description:
Grab*: Sand with shell fragments

Sieve: Shell fragments

Fauna Description:
Grab*: No fauna visible

Sieve: Annelida (Polychaeta), Mollusca - Scaphopoda

* No grab photo taken at the time of sampling

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 254 **E:** 307210 **N:** 6086324 **Depth:** 63m

Fix: 262 **E:** 307210 **N:** 6086324 **Depth:** 63m

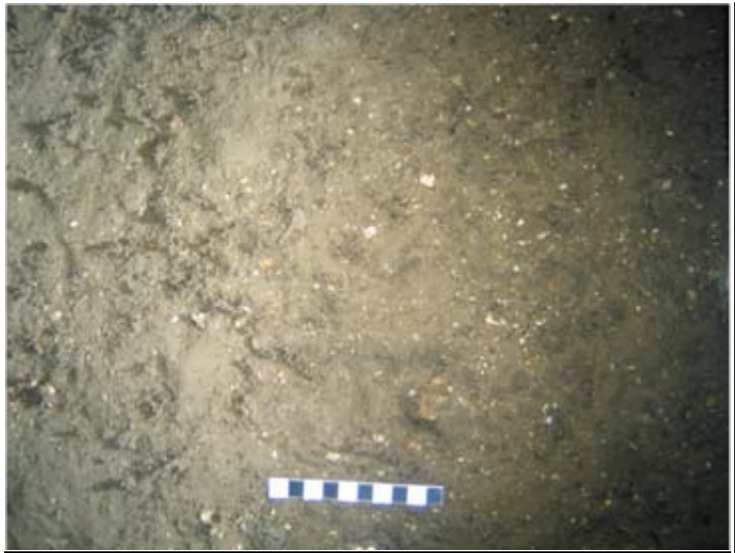
Station: TCC_33
Sediment Description:
Fix254: Fine sand with gravel, pebbles and shell fragments

Fix262: Fine sand with gravel, pebbles and shell fragments

Fauna Description:
Fix254: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Galatheidae, Paguridae, Other - Bryozoa, Cnidaria - *Alcyonium* sp., *Thuiaria thuja*, Sertulariidae

Fix262: Annelida (Polychaeta) - Polychaete tubes

Fix: 264 **E:** 307210 **N:** 6086324 **Depth:** 63m



Fix: 269 **E:** 307210 **N:** 6086324 **Depth:** 63m

Station: TCC_33
Sediment Description:
Fix264: Fine sand with gravel, pebbles and shell fragments

Fix269: Fine sand with gravel, pebbles and shell fragments

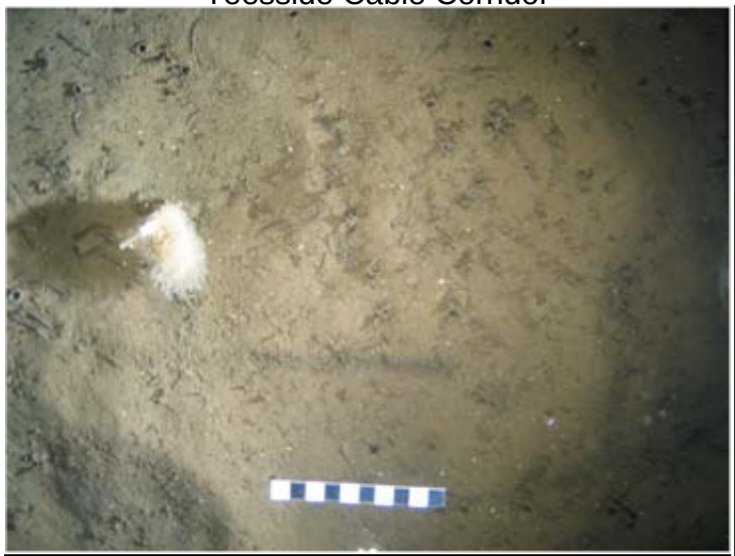
Fauna Description:
Fix264: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - Hydrozoa, Sertulariidae

Fix269: Annelida (Polychaeta) - Polychaete tubes, Other - Cnideria - Hydrozoa

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 274 **E:** 309497 **N:** 6087648 **Depth:** 72m



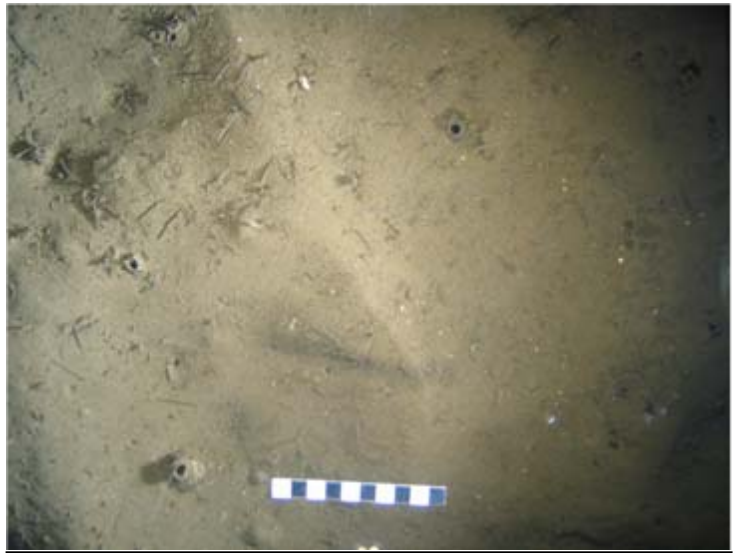
Fix: 277 **E:** 309497 **N:** 6087648 **Depth:** 72m

Station: TCC_34
Sediment Description:
Fix274: Fine sand with ripples and shell fragments

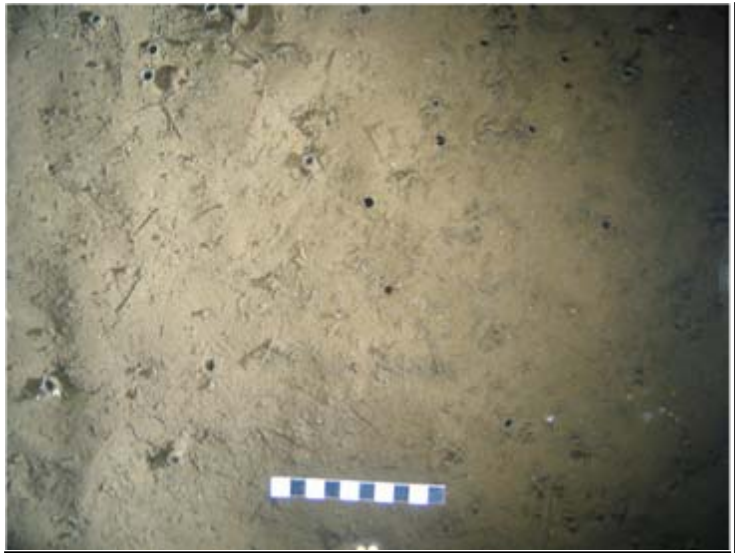
Fix277: Fine sand with ripples and shell fragments

Fauna Description:
Fix274: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea), Echinodermata – Ophiuroidea, Other - Cnidaria - *Alcyonium* sp.

Fix277: Annelida (Polychaeta) - Polychaete tubes, Echinodermata – Ophiuroidea, Other - Cnidaria - *Alcyonium* sp.



Fix: 279 **E:** 309497 **N:** 6087648 **Depth:** 72m



Fix: 280 **E:** 309497 **N:** 6087648 **Depth:** 72m

Station: TCC_34
Sediment Description:
Fix279: Fine sand with ripples and shell fragments

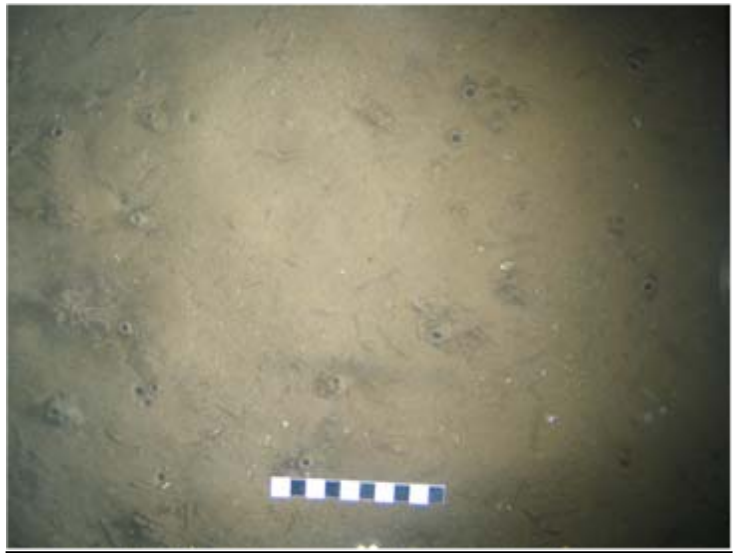
Fix280: Fine sand with shell fragments

Fauna Description:
Fix279: Annelida (Polychaeta) Polychaete tubes, Other - Foraminifera - *Astrorhiza* sp.

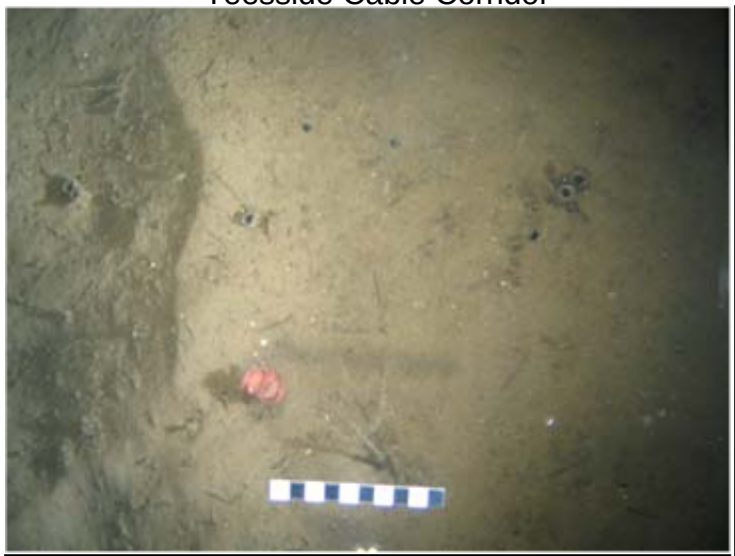
Fix280: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 285 **E:** 310957 **N:** 6088552 **Depth:** 75m



Fix: 288 **E:** 310995 **N:** 6088592 **Depth:** 75m

Station: TCC_35
Sediment Description:
Fix285: Fine to medium sand

Fix288: Fine to medium sand

Fauna Description:
Fix285: Annelida (Polychaeta) - Polychaete tubes

Fix288: Annelida (Polychaeta) - *Sabella* sp. tubes, Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*, Bioturbation - Faunal burrows

Fix: 22 **E:** 310912 **N:** 6088565 **Depth:** 75m

Fix: 22 **E:** 310911 **N:** 6088565 **Retention:** MF

Station: TCC_35
Sediment Description:
Grab: Fine sand

Sieve: Shells and shell fragments

Fauna Description:
Grab: Mollusca - Scaphopoda

Sieve: Annelida (Polychaeta) - Polychaeta, Mollusca - Scaphopoda

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 293 **E:** 312926 **N:** 6089894 **Depth:** 68m

Fix: 295 **E:** 312926 **N:** 6089894 **Depth:** 68m

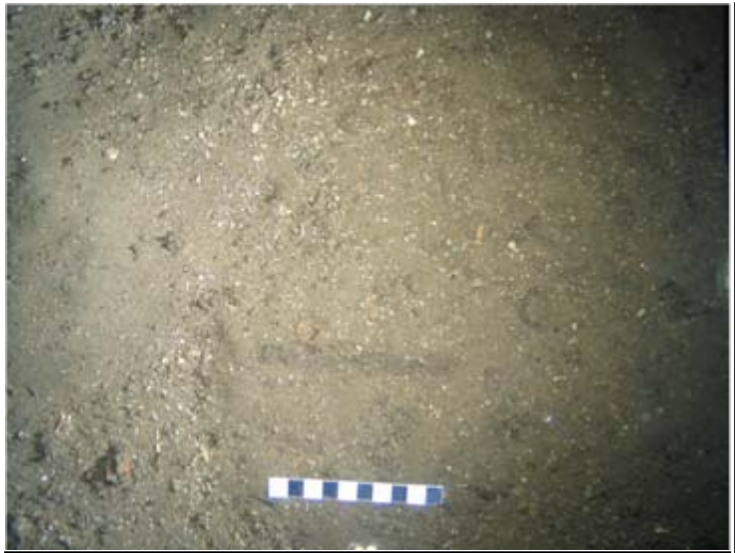
Station: TCC_36
Sediment Description:
Fix293: Fine sand and gravel with cobbles and shell fragments

Fix295: Fine sand and gravel with shell fragments

Fauna Description:
Fix293: Annelida (Polychaeta) - Polychaete tubes, *Spirobranchus* sp., Mollusca - Scaphopoda, Other - Cnidaria -Hydrozoa

Fix295: Annelida (Polychaeta) - Polychaete tubes, *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Mollusca - Scaphopoda, Other - Cnidaria - Hydrozoa

Fix: 298 **E:** 312926 **N:** 6089894 **Depth:** 68m



Fix: 301 **E:** 312926 **N:** 6089894 **Depth:** 68m

Station: TCC_36
Sediment Description:
Fix298: Fine sand and gravel with shell fragments

Fix301: Fine sand and gravel with shell fragments

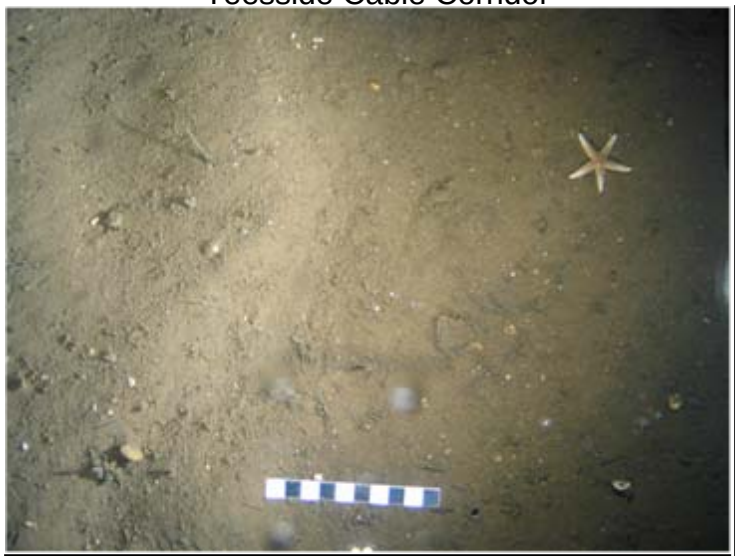
Fauna Description:
Fix298: Annelida (Polychaeta) - Polychaete tubes, *Spirobranchus* sp., Other - Cnidaria - Hydrozoa

Fix301: Annelida (Polcyhaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 304 **E:** 314110 **N:** 6090576 **Depth:** 68m



Fix: 310 **E:** 314110 **N:** 6090576 **Depth:** 68m

Station: TCC_37
Sediment Description:
Fix304: Fine sand with occasional shell fragments

Fix310: Fine sand with occasional shell fragments

Fauna Description:
Fix304: Annelida (Polychaeta) - Polychaete tubes

Fix310: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Asterias rubens*

Fix: 18 **E:** 314121 **N:** 6090572 **Depth:** 68m

Fix: 18 **E:** 314121 **N:** 6090572 **Retention:** MF

Station: TCC_37
Sediment Description:
Grab: Lots of shell fragments, some whole shells and pebbles

Sieve: Shell and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Echinocardium* sp., Ophiuroidea Other - Bryozoa

Sieve: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Echinocardium* sp., Ophiuroidea, Other - Bryozoa

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 313 **E:** 316637 **N:** 6092582 **Depth:** 71m

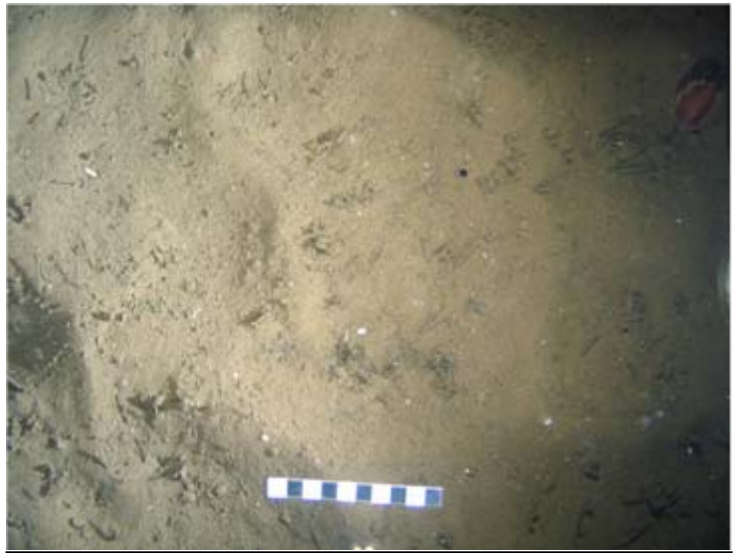
Fix: 316 **E:** 316637 **N:** 6092582 **Depth:** 71m

Station: TCC_38
Sediment Description:
Fix313: Fine sand with occasional shell fragments

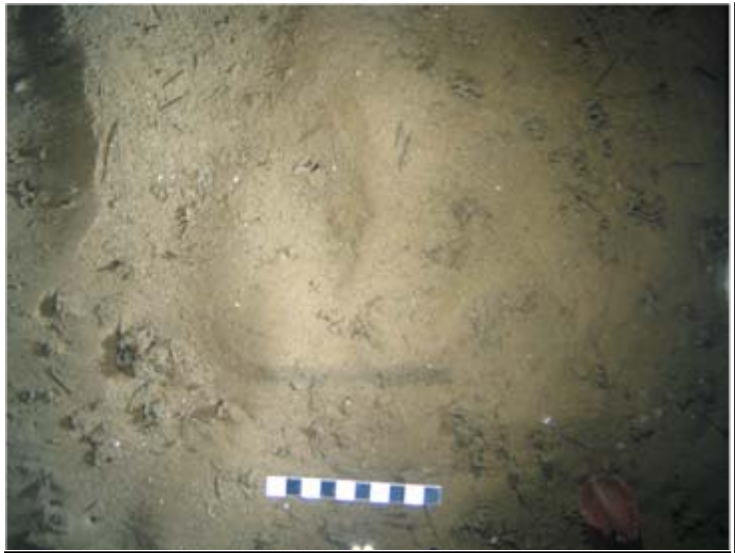
Fix316: Fine sand with ripples and occasional shell fragments

Fauna Description:
Fix313: Annelida (Polychaeta) - Polychaeta, Polychaete tubes, Echinodermata - Ophiuroidea, Other - Cnidaria *Pennatula phosphorea*, Hydrozoa, Foraminifera - *Astrorhiza* sp.

Fix316: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - Hydrozoa



Fix: 318 **E:** 316637 **N:** 6092582 **Depth:** 71m



Fix: 320 **E:** 316637 **N:** 6092582 **Depth:** 71m

Station: TCC_38
Sediment Description:
Fix318: Fine sand with ripples and occasional shell fragments

Fix320: Fine sand with ripples and occasional shell fragments

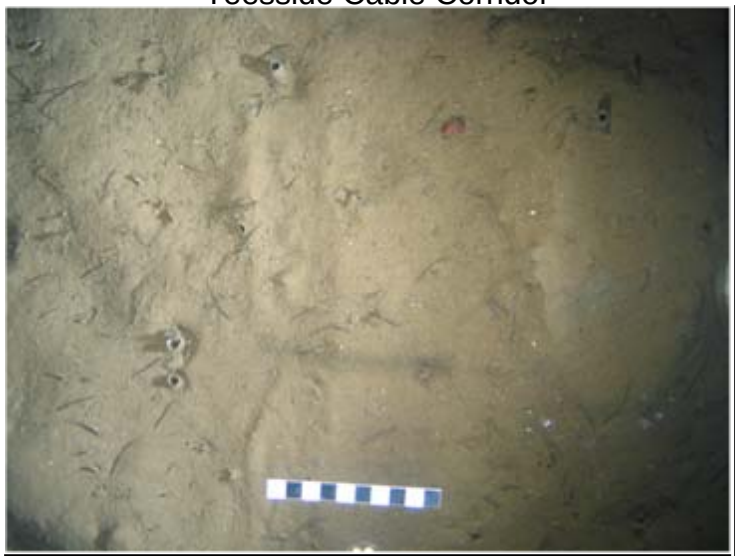
Fauna Description:
Fix318: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix320: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - Ophiuroidea, Other - Cnidaria - *Pennatula phosphorea*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 329 **E:** 317881 **N:** 6092923 **Depth:** 73m



Fix: 334 **E:** 317881 **N:** 6092923 **Depth:** 73m

Station: TCC_39
Sediment Description:
Fix329: Fine sand with ripples and occasional shell fragments

Fix334: Fine sand with ripples and occasional shell fragments

Fauna Description:
Fix329: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - Hydrozoa, *Pennatula phosphorea*, Foraminifera - *Astrorhiza* sp.

Fix334: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix: 16 **E:** 317888 **N:** 6092919 **Depth:** 73m

Fix: 16 **E:** 317888 **N:** 6092919 **Retention:** MF

Station: TCC_39
Sediment Description:
Grab: Fine dark sand

Sieve: Some shell fragments

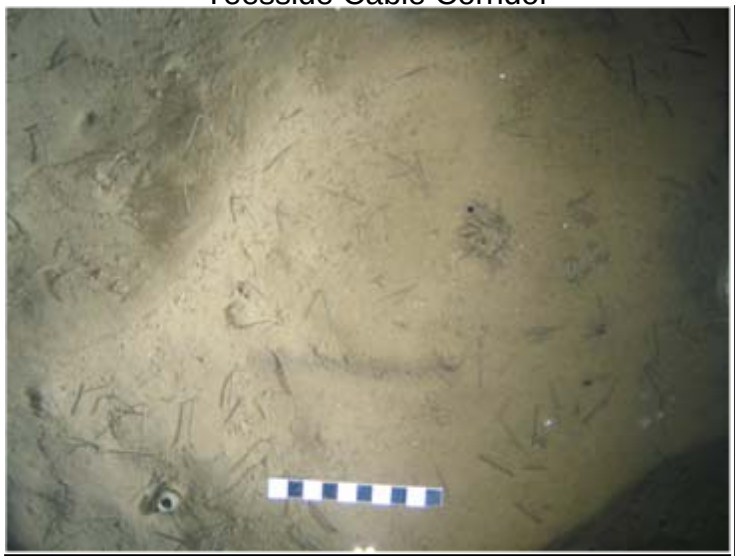
Fauna Description:
Grab: Annelida (Polychaeta)

Sieve: Annelida (Polychaeta) - Pectinariidae, Polychaeta, Arthropoda (Crustacea) - Amphipoda, Mollusca - Scaphapoda, Echinodermata - Ophiuroidea, Other - Bryozoa, Cnidaria - Actiniaria, Hydrozoa

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 350 **E:** 324741 **N:** 6094127 **Depth:** 74m



Fix: 357 **E:** 324741 **N:** 6094127 **Depth:** 74m

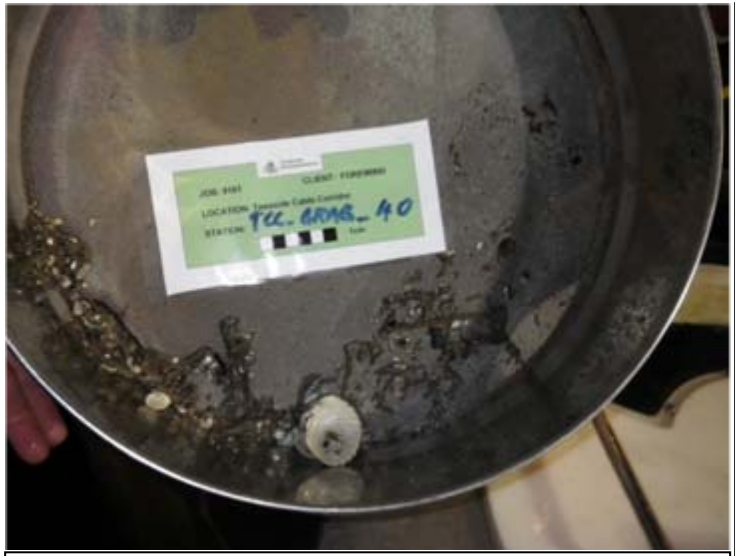
Station: TCC_40
Sediment Description:
Fix350: Fine sand with ripples and occasional shell fragments

Fix357: Fine sand with ripples and occasional shell fragments

Fauna Description:
Fix350: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix357: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria- Hydrozoa

Fix: 29 **E:** 324712 **N:** 6094132 **Depth:** 74m



Fix: 29 **E:** 324712 **N:** 6094132 **Retention:** MF

Station: TCC_40
Sediment Description:
Grab: Fine dark brown sand, few shells and shell fragments

Sieve: Some shell fragments, with occasional shells

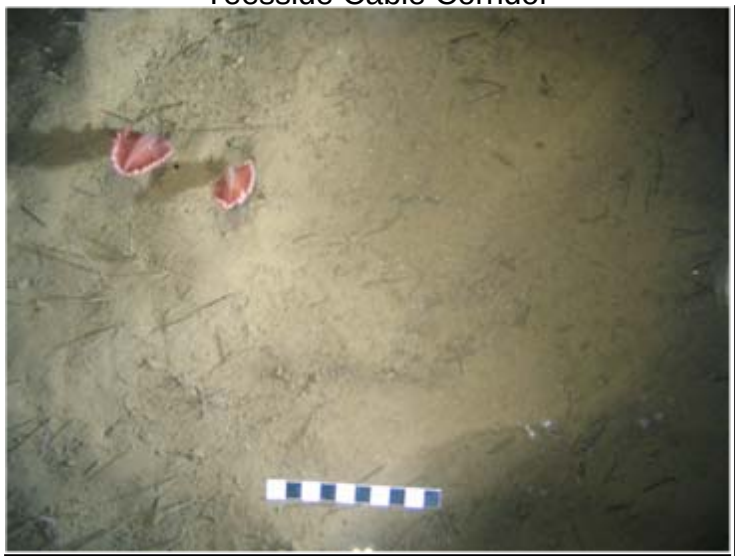
Fauna Description:
Grab: Annelida (Polycheata)

Sieve: Annelida (Polycheata), Arthropoda, Echinodermata - Echinoidea, Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 339 **E:** 325403 **N:** 6094267 **Depth:** 75m



Fix: 341 **E:** 325403 **N:** 6094267 **Depth:** 75m

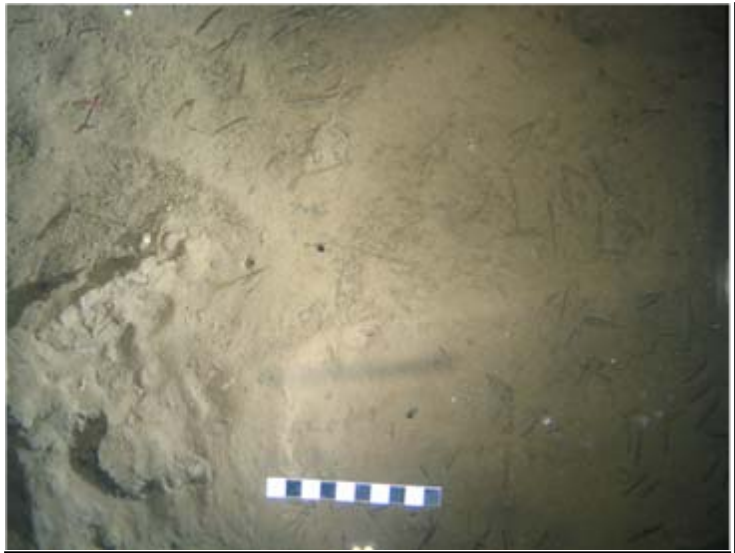
Station: TCC_41
Sediment Description:
Fix339: Fine sand with ripples and occasional shell fragments

Fix341: Fine sand with ripples and occasional shell fragments

Fauna Description:
Fix339: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix341: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix: 344 **E:** 325403 **N:** 6094267 **Depth:** 75m



Fix: 347 **E:** 325403 **N:** 6094267 **Depth:** 75m

Station: TCC_41
Sediment Description:
Fix344: Fine sand with ripples and occasional shell fragments

Fix347: Fine sand with ripples and occasional shell fragments

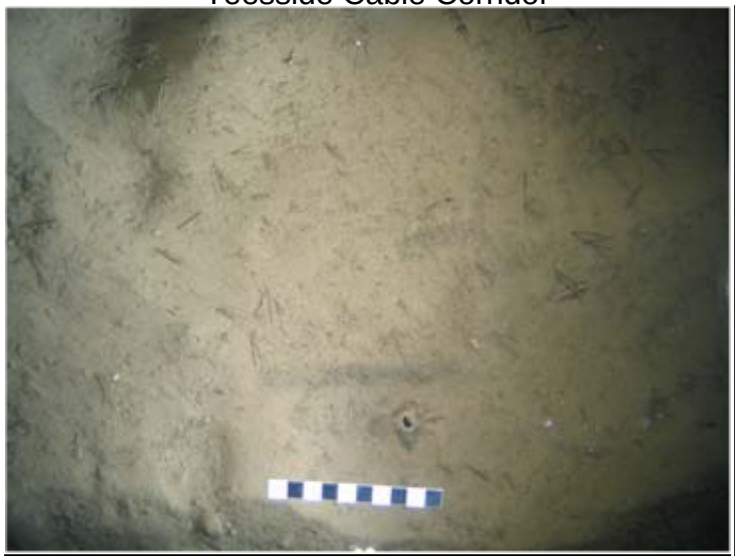
Fauna Description:
Fix344: Annelida (Polychaeta) - Polychaete tubes

Fix347: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 363 **E:** 334771 **N:** 6095150 **Depth:** 78m



Fix: 368 **E:** 334771 **N:** 6095150 **Depth:** 78m

Station: TCC_42
Sediment Description:
Fix363: Fine sand with ripples and occasional shell fragments

Fix368: Fine sand with ripples and occasional shell fragments

Fauna Description:
Fix363: Annelida (Polychaeta), Echinodermata - *Astropecten irregularis*, Ophiuroidea, Other – Cnidaria - *Pennatula phosphorea*

Fix368: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Caridea

Fix: 78 **E:** 334762 **N:** 6095173 **Depth:** 78m

Fix: 78 **E:** 334762 **N:** 6095173 **Retention:** MF

Station: TCC_42
Sediment Description:
Grab: Fine sand with fines component and some shell fragments

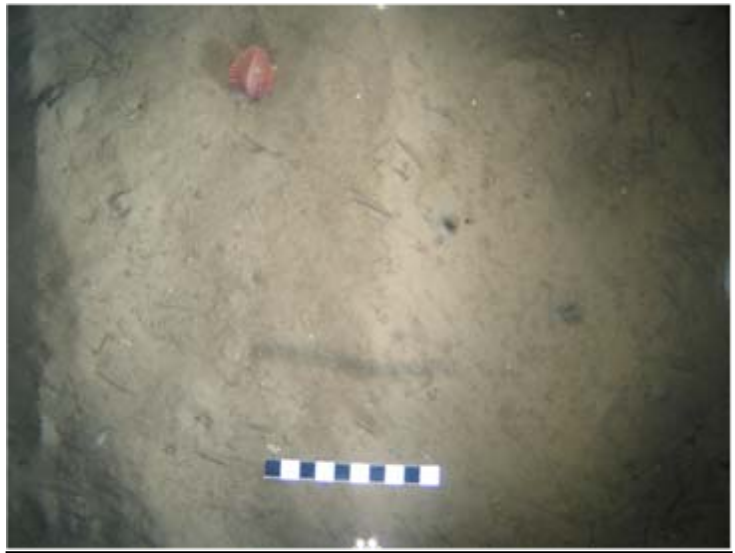
Sieve: Shell and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta), Mollusca - Bivalvia

Sieve: Annelida (Polychaeta), Mollusca - Bivalvia

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 915 **E:** 335874 **N:** 6095390 **Depth:** 83m

Fix: 923 **E:** 335874 **N:** 6095390 **Depth:** 83m

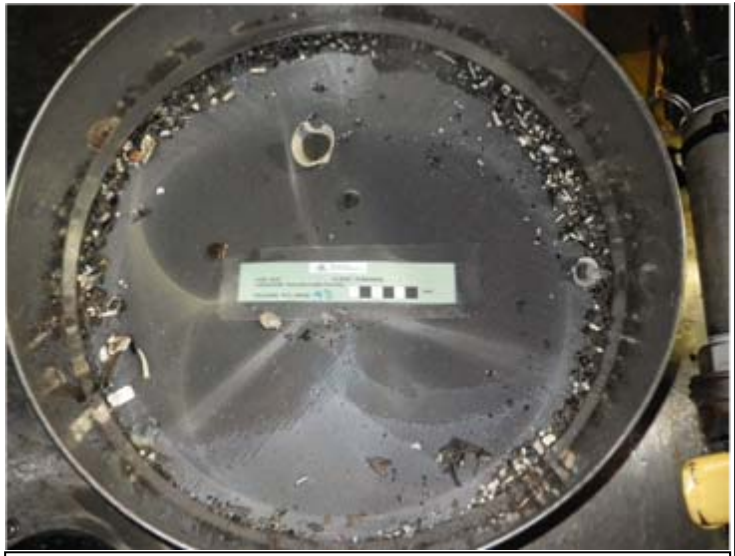
Station: TCC_43
Sediment Description:
Fix915: Fine sand with ripples and occasional shell fragments

Fix923: Fine sand with ripples and occasional shell fragments

Fauna Description:
Fix915: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - Ophiuroidea, Other - Cnidaria - *Pennatula phosphorea*

Fix923: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix: 77 **E:** 335891 **N:** 6095422 **Depth:** 83m



Fix: 77 **E:** 335891 **N:** 6095422 **Retention:** MF

Station: TCC_43
Sediment Description:
Grab: Fine sand with fines component some shell fragments

Sieve: Some shells and shell fragments

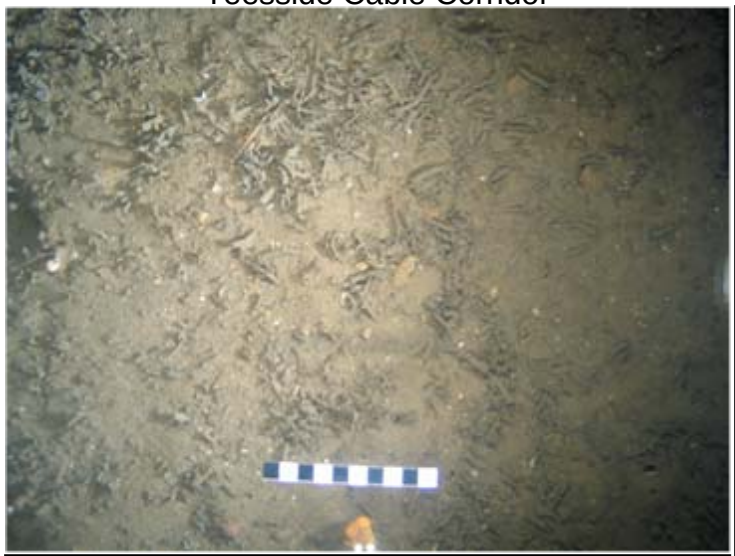
Fauna Description:
Grab: Annelida (Polychaeta), Mollusca - Bivalvia, Cnidaria - Actiniaria

Sieve: Annelida (Polychaeta), Mollusca - Bivalvia, Other - Cnidaria - Actiniaria

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 928 **E:** 339975 **N:** 6097120 **Depth:** 72m



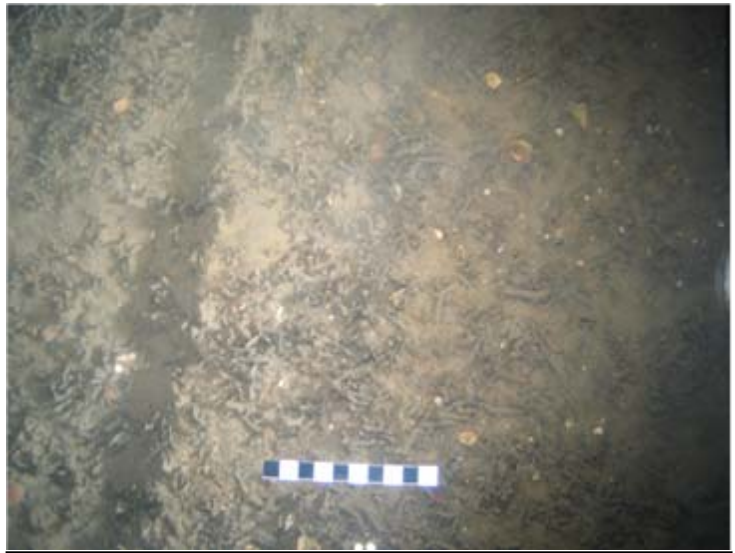
Fix: 930 **E:** 340003 **N:** 6097107 **Depth:** 72m

Station: TCC_44
Sediment Description:
Fix928: Muddy sand with occasional shell fragments and boulders

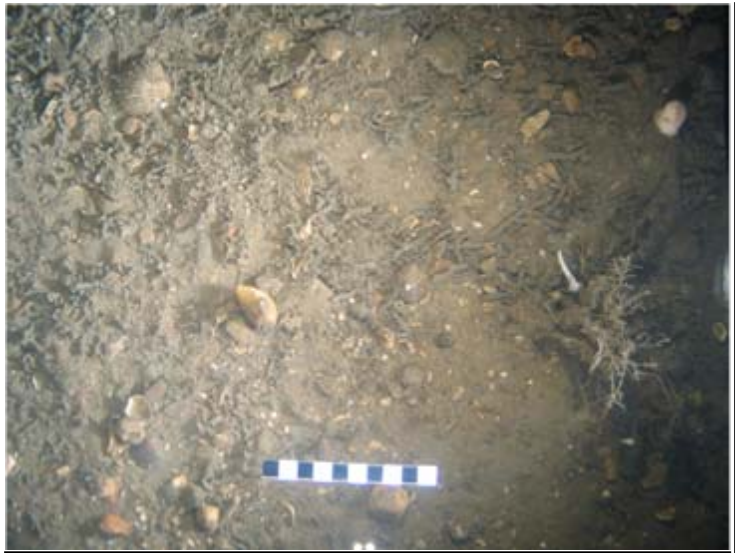
Fix930: Muddy sand with shell fragments

Fauna Description:
Fix928: Annelida (Polychaeta) - Polychaeta, *Spirobranchus* sp., Mollusca – Nudibranchia, Other - Cnidaria - *Alcyonium* sp.

Fix930: Annelida (Polychaeta), Other - Cnidaria - Hydrozoa, *Alcyonium* sp.



Fix: 934 **E:** 339985 **N:** 6097108 **Depth:** 72m



Fix: 936 **E:** 340000 **N:** 6097109 **Depth:** 72m

Station: TCC_44
Sediment Description:
Fix934: Muddy sand with occasional shell fragments

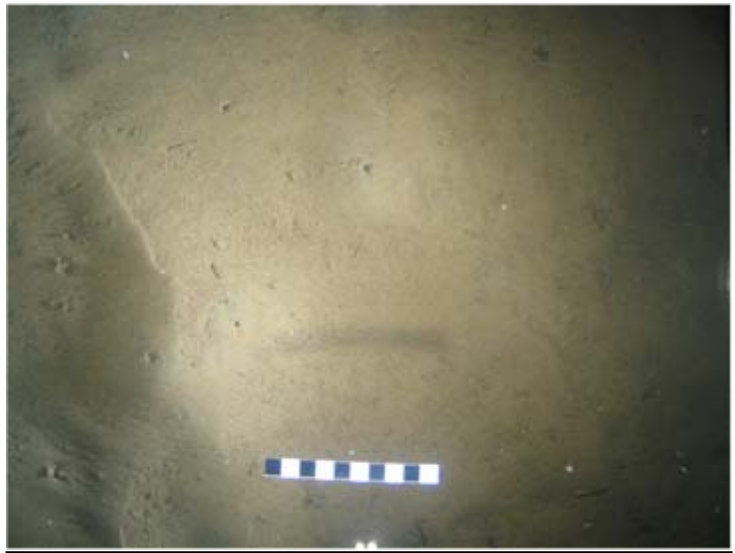
Fix936: Muddy sand with occasional shell fragments

Fauna Description:
Fix934: Annelida (Polychaeta), Other - Cnidaria - Hydrozoa, *Pennatula phosphorea*

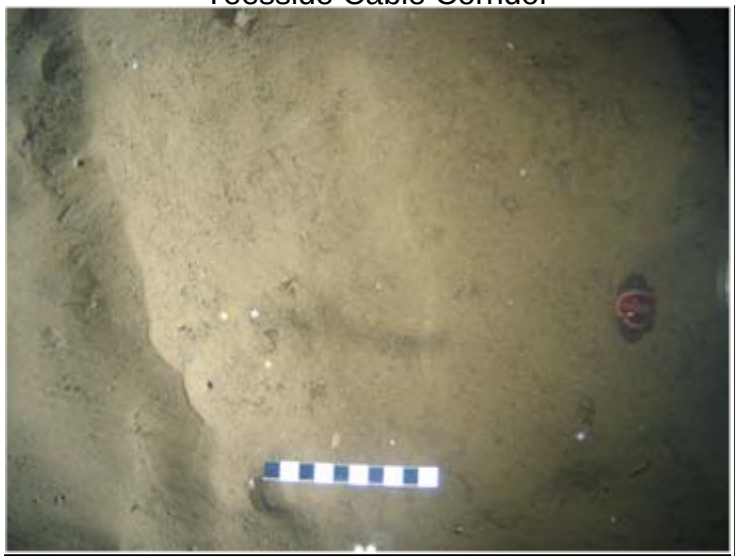
Fix936: Annelida (Polychaeta) - Polychaeta, *Spirobranchus* sp., Other - Cnidaria - Sertulariidae, *Alcyonium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 943 **E:** 343678 **N:** 6097837 **Depth:** 73m



Fix: 944 **E:** 343680 **N:** 6097843 **Depth:** 73m

Station: TCC_45
Sediment Description:
Fix943: Fine sand with occasional shell fragments

Fix944: Fine sand with occasional shell fragments

Fauna Description:
Fix943: Annelida (Polychaeta), bioturbation

Fix944: Annelida (Polychaeta), Other - Cnidaria - *Pennatula phosphorea,* bioturbation

Fix: 79 **E:** 343701 **N:** 6097859 **Depth:** 73m

Fix: 79 **E:** 343701 **N:** 6097859 **Retention:** MF

Station: TCC_45
Sediment Description:
Grab: Muddy sand with occasional shell fragments

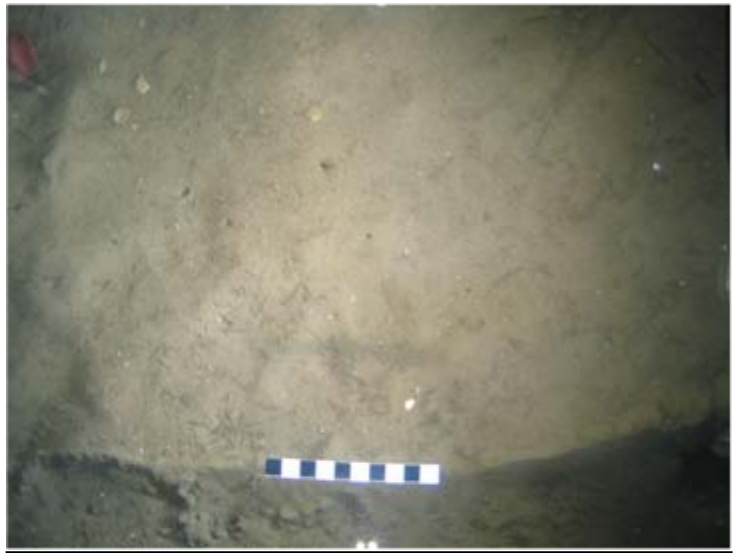
Sieve: Shells and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Mollusca - Scaphopoda

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 945 **E:** 345261 **N:** 6098195 **Depth:** 75m

Fix: 953 **E:** 345288 **N:** 6098207 **Depth:** 75m

Station: TCC_46
Sediment Description:
Fix945: Muddy sand with occasional shell fragments

Fix953: Muddy sand with occasional shell fragments

Fauna Description:
Fix945: Annelida (Polychaeta), Other – Cnidaria - *Pennatula phosphorea*

Fix953: Annelida (Polychaeta), Other – Cnidaria - *Pennatula phosphorea*

Fix: 80* **E:** 345292 **N:** 6098200 **Depth:** 75m

Fix: 80 **E:** 345292 **N:** 6098200 **Retention:** MF

Station: TCC_46
Sediment Description:
Grab*: Cohesive sandy mud

Sieve: Shell fragments with shells

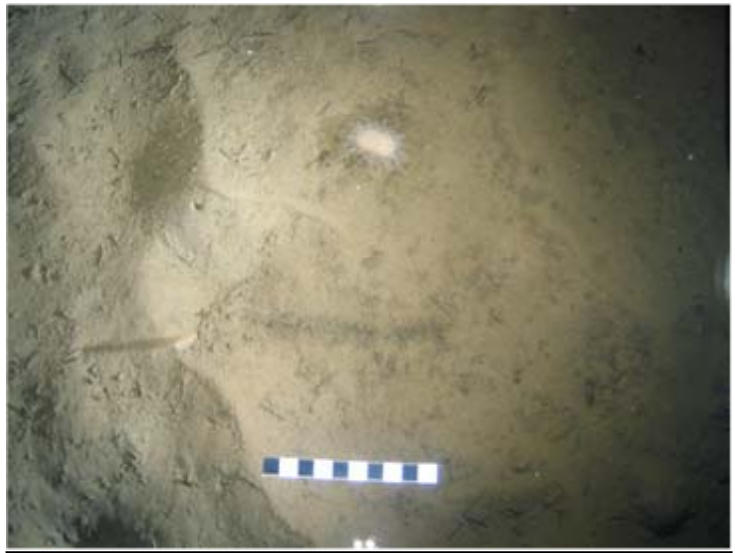
Fauna Description:
Grab*: No visible fauna

Sieve: Annelida (Polychaeta), Mollusca - Scaphopoda

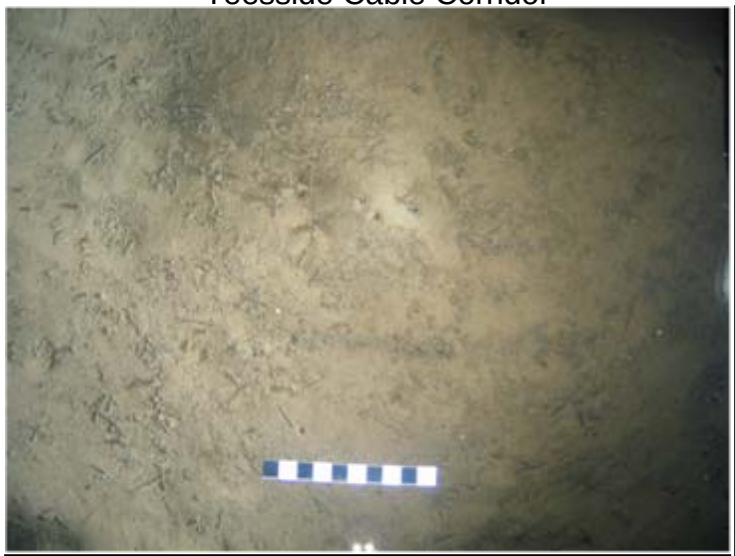
* No grab photo taken at the time of sampling

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 954 **E:** 348071 **N:** 6097698 **Depth:** 74m



Fix: 958 **E:** 348071 **N:** 6097698 **Depth:** 74m

Station: TCC_47
Sediment Description:
Fix954: Fine sand with ripples and shell fragments

Fix958: Fine sand with ripples and shell fragments

Fauna Description:
Fix954: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - Ophiuroidea, Other – Cnidaria - *Alcyonium* sp., *Virgularia mirabilis*, Foraminifera - *Astrorhiza* sp.

Fix958: Annelida (Polychaeta) - Polychaete tubes

Fix: 81 **E:** 348077 **N:** 6097713 **Depth:** 74m

Fix: 81 **E:** 348077 **N:** 6097713 **Retention:** MF

Station: TCC_47
Sediment Description:
Grab: Fine muddy sand

Sieve: Shell and shell fragments

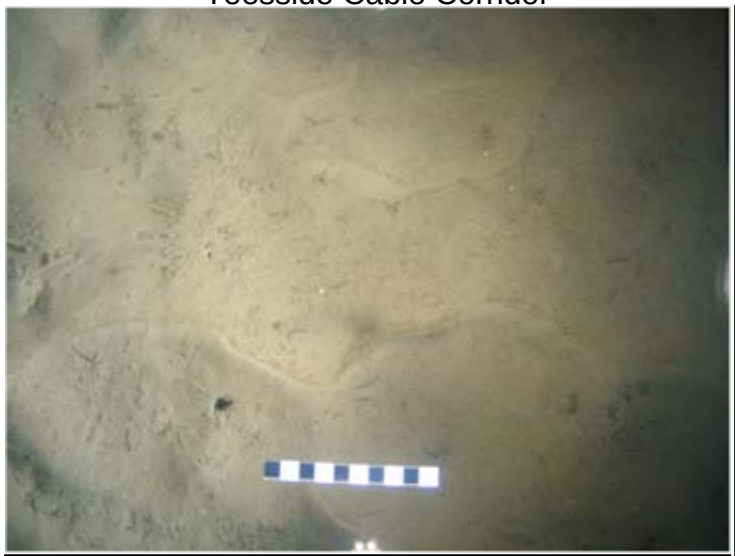
Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Arthropoda (Crustacea) - Amphipoda, Mollusca - Bivalvia, Scaphopoda, Other - Chordata – Ascidiacea, Cnideria - *Pennatula phosphorea*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 990 **E:** 353888 **N:** 6098841 **Depth:** 74m



Fix: 993 **E:** 353888 **N:** 6098841 **Depth:** 74m

Station: TCC_48
Sediment Description:
Fix990: Fine sand with ripples and shell fragments

Fix993: Fine sand with shell fragments

Fauna Description:
Fix990: Annelida (Polychaeta), Other – Chordata – Gobiidae, Cnideria - *Pennatula phosphorea*

Fix993: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix: 82 **E:** 353894 **N:** 6098832 **Depth:** 74m

Fix: 82 **E:** 353894 **N:** 6098832 **Retention:** MF

Station: TCC_48
Sediment Description:
Grab: Fine muddy sand with shell fragments

Sieve: Shell and shell fragments

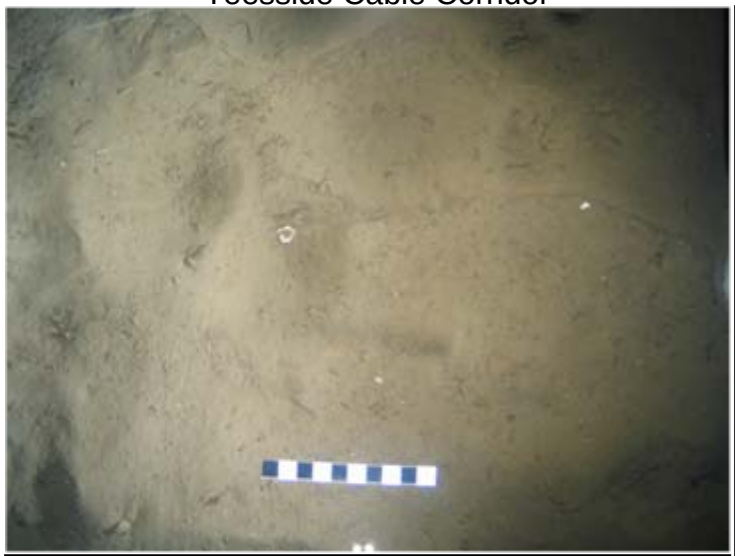
Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Mollusca

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 1005 **E:** 358822 **N:** 6099322 **Depth:** 73m



Fix: 1006 **E:** 358822 **N:** 6099322 **Depth:** 73m

Station: TCC_49
Sediment Description:
Fix1005: Fine sand with ripples and shell fragments

Fix1006: Fine sand with ripples and shell fragments

Fauna Description:
Fix1005: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Acyonium* sp., *Pennatula phosphorea*

Fix1006: Annelida (Polychaeta) Polychaete tubes

Fix: 83 **E:** 358842 **N:** 6099299 **Depth:** 73m

Fix: 83 **E:** 358842 **N:** 6099299 **Retention:** MF

Station: TCC_49
Sediment Description:
Grab: Fine muddy sand with shell and shell fragments

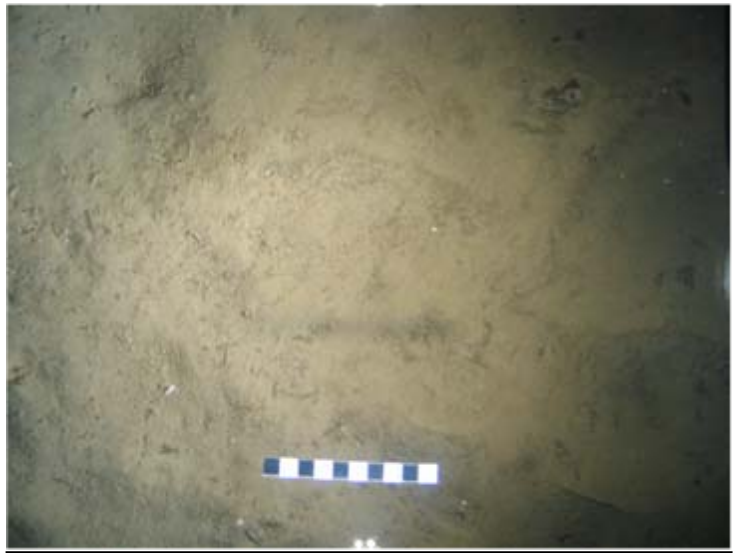
Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta)

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 995 **E:** 359464 **N:** 6099383 **Depth:** 71m

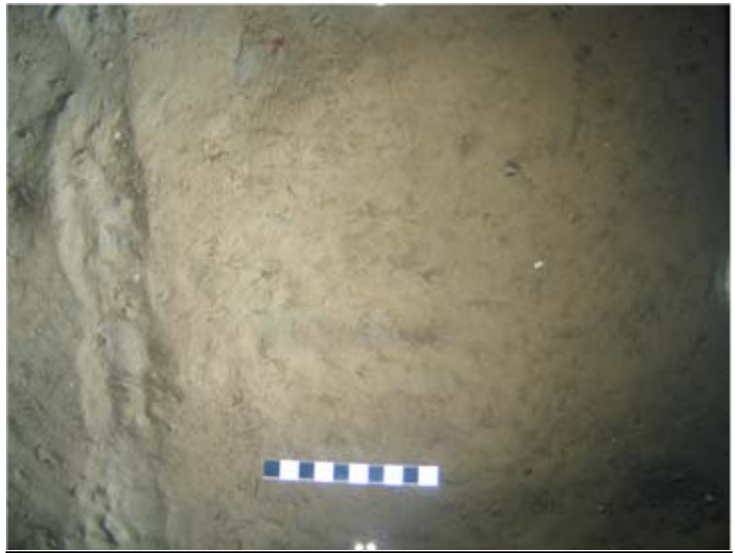
Fix: 997 **E:** 359464 **N:** 6099383 **Depth:** 71m

Station: TCC_50
Sediment Description:
Fix995: Fine sand with ripples and shell fragments

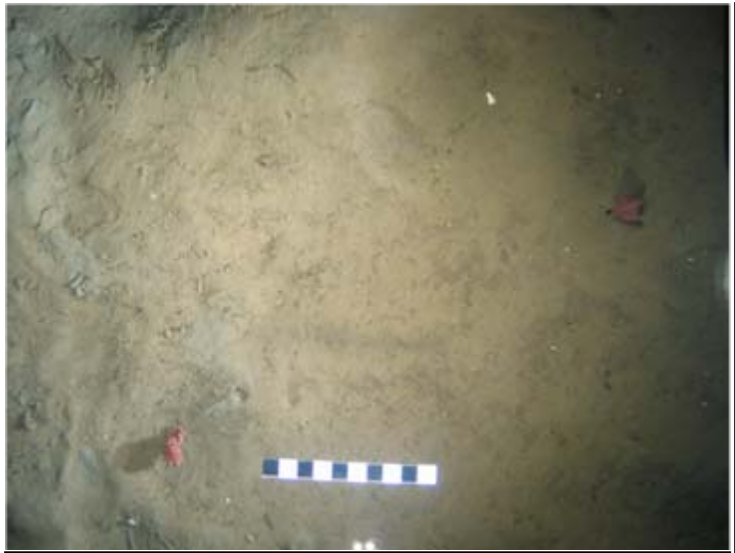
Fix997: Fine sand with ripples and shell fragments

Fauna Description:
Fix995: Annelida (Polychaeta) Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix997: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*, Foraminifera- *Astrorhiza* sp.



Fix: 999 **E:** 359464 **N:** 6099383 **Depth:** 71m



Fix: 1001 **E:** 359464 **N:** 6099383 **Depth:** 71m

Station: TCC_50
Sediment Description:
Fix999: Fine sand with ripples and shell fragments

Fix1001: Fine sand with ripples and shell fragments

Fauna Description:
Fix999: Annelida (Polychaeta) - Polychaete tubes, Cnidaria - *Pennatula phosphorea*, Foraminifera - *Astrorhiza* sp.

Fix1001: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*, Foraminifera - *Astrorhiza* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 1016 **E:** 364740 **N:** 6100767 **Depth:** 62m

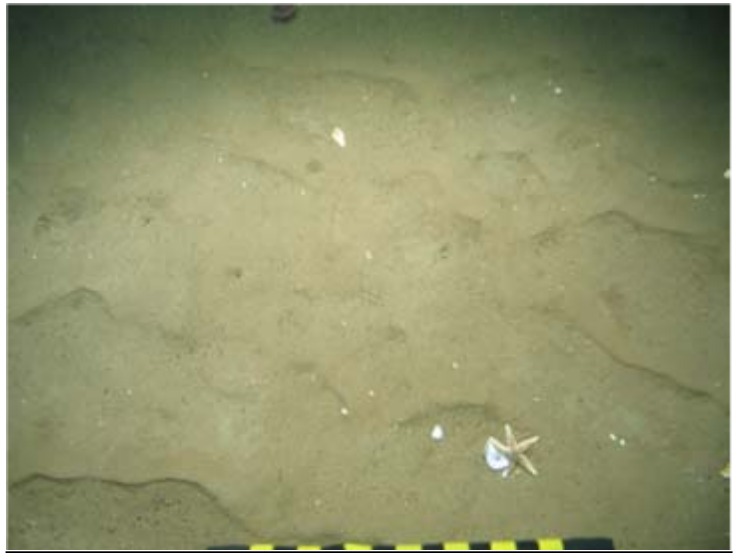
Fix: 1029 **E:** 364740 **N:** 6100767 **Depth:** 62m

Station: TCC_51
Sediment Description:
Fix1016: Fine sand and shell fragments

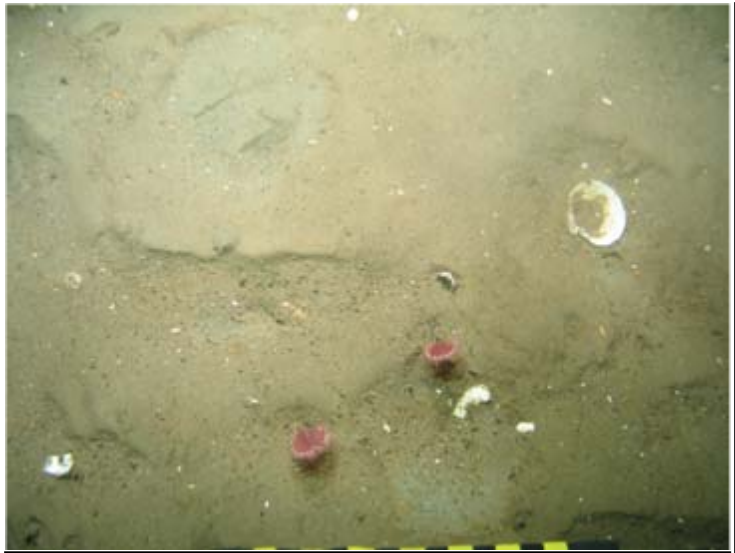
Fix1029: Fine sand and shell fragments

Fauna Description:
Fix1016: Other - Cnidaria - *Pennatula phosphorea*

Fix1029: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*, bioturbation



Fix: 1015 **E:** 364740 **N:** 6100767 **Depth:** 62m



Fix: 1025 **E:** 364740 **N:** 6100767 **Depth:** 62m

Station: TCC_51
Sediment Description:
Fix1015: Fine sand and shell fragments

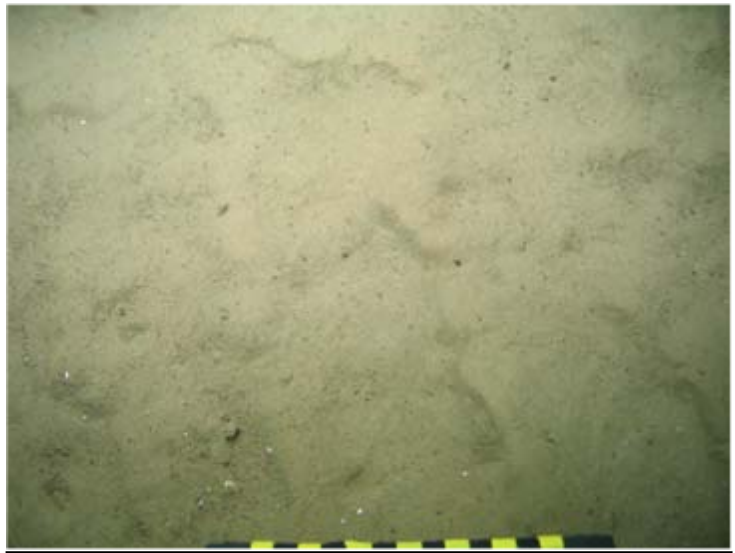
Fix1025: Fine sand and shell fragments

Fauna Description:
Fix1015: Echinodermata - *Asterias rubens*, Other - Cnidaria - *Pennatula phosphorea*, bioturbation

Fix1025: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*, bioturbation

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 1031 **E:** 366405 **N:** 6100887 **Depth:** 63m

Fix: 1043 **E:** 366405 **N:** 6100887 **Depth:** 63m

Station: TCC_52
Sediment Description:
Fix1031: Fine sand

Fix1043: Fine sand

Fauna Description:
Fix1031: Annelida (Polychaete tubes), bioturbation

Fix1043: Annelida (Polychaete tubes), Cnidaria (*Pennatula phosphorea*), bioturbation

Fix: 85 **E:** 366400 **N:** 6100912 **Depth:** 63m

Fix: 85 **E:** 366400 **N:** 6100912 **Retention:** MF

Station: TCC_52
Sediment Description:
Grab: Fine muddy sand and shell fragments

Sieve: Shell and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Echinodermata - Ophiuroidea, *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 1045 **E:** 371373 **N:** 6100444 **Depth:** 61m

Fix: 1064 **E:** 371373 **N:** 6100444 **Depth:** 61m

Station: TCC_53
Sediment Description:
Fix1045: Fine sand with shell fragments

Fix1064: Fine sand with shell fragments

Fauna Description:
Fix1045: Annelida (Polychaeta) - Polychaete tubes, bioturbation

Fix1064: Annelida (Polychaeta) - Polychaete tubes, bioturbation

Fix: 89 **E:** 371376 **N:** 6100446 **Depth:** 61m

Fix: 89 **E:** 371376 **N:** 6100446 **Retention:** MF

Station: TCC_53
Sediment Description:
Grab: Muddy sand, gravel, pebbles, cobbles and shell

Sieve: Pebbles, gravels, shell and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 1070 **E:** 378320 **N:** 6102070 **Depth:** 62m

Fix: 1077 **E:** 378320 **N:** 6102070 **Depth:** 62m

Station: TCC_54
Sediment Description:
Fix1070: Fine sand with shell fragments

Fix1077: Fine sand with shell fragments

Fauna Description:
Fix1070: Annelida (Polychaeta) - Polychaete tubes, bioturbation

Fix1077: Annelida (Polychaeta) - Polychaete tubes, Aphroditidae, bioturbation

Fix: 90 **E:** 378322 **N:** 6102064 **Depth:** 62m

Fix: 90 **E:** 378322 **N:** 6102064 **Retention:** MF

Station: TCC_54
Sediment Description:
Grab: Muddy sand with shell fragments

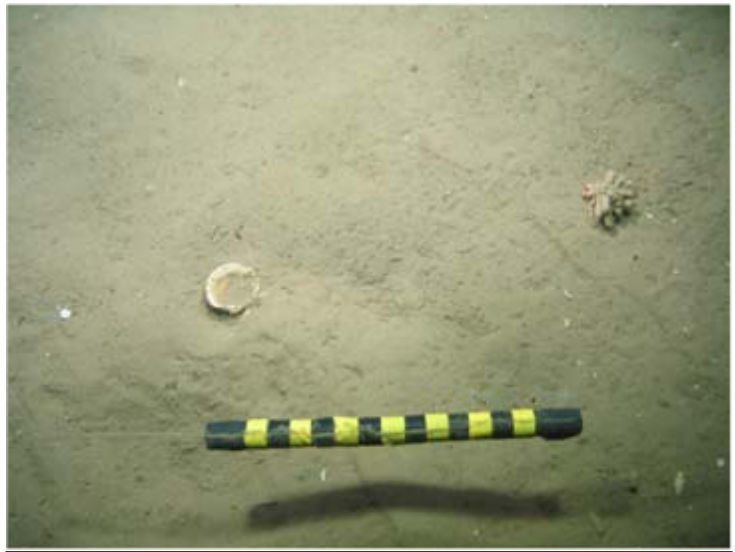
Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Mollusca, Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 1084 **E:** 386344 **N:** 6102953 **Depth:** 57m

Fix: 1093 **E:** 386344 **N:** 6102953 **Depth:** 57m

Station: TCC_55
Sediment Description:
Fix1084: Fine sand with shell fragments

Fine sand with shell fragments

Fix1110: Fine sand with shell fragments

Fauna Description:
Fix1099: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Alcyonium* sp., bioturbation

Fix1110: Annelida (Polychaeta) - Polychaete tubes, bioturbation

Fix: 91 **E:** 386356 **N:** 6102950 **Depth:** 57m

Fix: 91 **E:** 386356 **N:** 6102950 **Retention:** MF

Station: TCC_55
Sediment Description:
Grab: Fine muddy sand with shell fragments

Sieve: Shells and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta)

Sieve: Annelida (Polychaeta), Mollusca, Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 1099 **E:** 390777 **N:** 6103414 **Depth:** 43

Fix: 1110 **E:** 390777 **N:** 6103414 **Depth:** 43

Station: TCC_56
Sediment Description:
Fix1099: Fine sand with shell fragments

Fix1110: Fine sand with shell fragments

Fauna Description:
Fix1099: Annelida (Polychaete tubes), Cnidaria (*Alcyonium* sp.), bioturbation

Fix1110: Annelida (Polychaete tubes), bioturbation

Fix: 92 **E:** 390773 **N:** 6103411 **Depth:** 43

Fix: 92 **E:** 390773 **N:** 6103411 **Retention:** MF

Station: TCC_56
Sediment Description:
Grab: Fine muddy sand with lots of shell and shell fragments

Sieve: Shell and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta)

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 1112 **E:** 394187 **N:** 6102773 **Depth:** 29m

Fix: 1123 **E:** 394187 **N:** 6102773 **Depth:** 29m

Station: TCC_57
Sediment Description:
Fix1112: Fine sand with shell fragments

Fix1123: Fine sand with shell fragments

Fauna Description:
Fix1112: No visible fauna

Fix1123: Annelida (Polychaeta) - Polychaete tubes, bioturbation

Fix: 93 **E:** 394189 **N:** 6102775 **Depth:** 28m

Fix: 93 **E:** 394189 **N:** 6102775 **Retention:** MF

Station: TCC_57
Sediment Description:
Grab: Sand with shell fragments

Sieve: Shell and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta)

Sieve: Annelida (Polychaeta)

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 1126 **E:** 395021 **N:** 6102915 **Depth:** 27m

Fix: 1129 **E:** 395029 **N:** 6102902 **Depth:** 27m

Station: TCC_58
Sediment Description:
Fix1126: Gravelly sand with ripples

Fix1129: Gravelly sand with ripples

Fauna Description:
Fix1126: No visible fauna

Fix1129: No visible fauna

Fix: 1131 **E:** 395032 **N:** 6102902 **Depth:** 27m

Fix: 1135 **E:** 395019 **N:** 6102908 **Depth:** 27m

Station: TCC_58
Sediment Description:
Fix1131: Gravelly sand with ripples

Fix1135: Gravelly sand with ripples

Fauna Description:
Fix1131: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Paguridae

Fix1135: No visible fauna

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 1137 **E:** 396390 **N:** 6104112 **Depth:** 32m

Fix: 1139 **E:** 396396 **N:** 6104110 **Depth:** 32m

Station: TCC_59
Sediment Description:
Fix1137: Sand with ripples

Fix1139: Sand with ripples

Fauna Description:
Fix1137: No visible fauna

Fix1139: No visible fauna

Fix: 1141 **E:** 396381 **N:** 6104103 **Depth:** 32m

Fix: 1143 **E:** 396371 **N:** 6104113 **Depth:** 32m

Station: TCC_59
Sediment Description:
Fix1141: Sand with ripples

Fix1143: Sand with ripples

Fauna Description:
Fix1141: No visible fauna

Fix1143: No visible fauna

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 1150 **E:** 396752 **N:** 6104214 **Depth:** 34m

Fix: 1152 **E:** 396741 **N:** 6104223 **Depth:** 34m

Station: TCC_60
Sediment Description:
Fix1150: Gravelly sand

Fix1152: Gravelly sand

Fauna Description:
Fix1150: No visible fauna

Fix1152: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Paguridae, Other - Cnidaria - Actiniaria

Fix: 1154 **E:** 396766 **N:** 6104186 **Depth:** 34m

Fix: 1157 **E:** 396740 **N:** 6104222 **Depth:** 34m

Station: TCC_60
Sediment Description:
Fix1154: Gravelly sand

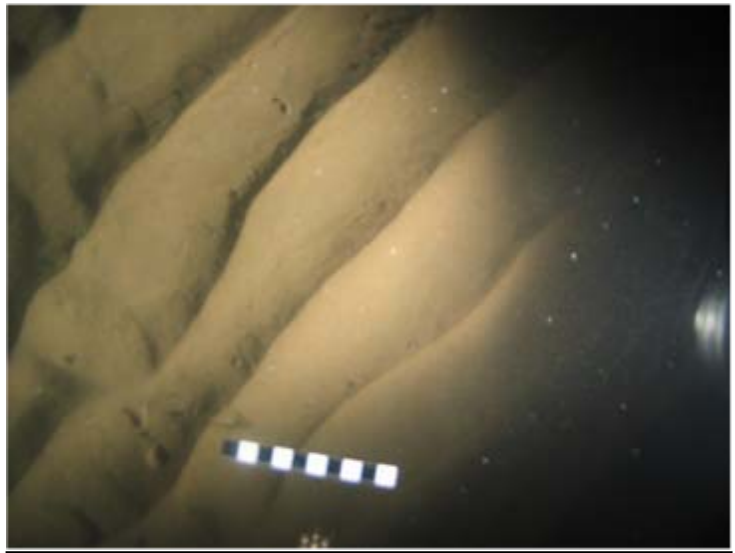
Fix1157: Gravelly sand

Fauna Description:
Fix1154: Annelida (Polychaeta) - *Spirobranchus* sp.

Fix1157: Annelida (Polychaeta) - *Spirobranchus* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 318 **E:** 241801 **N:** 6057876 **Depth:** 6m

Fix: 321 **E:** 241801 **N:** 6057873 **Depth:** 6m

Station: TCC_61
Sediment Description:
Fix318: Sand with ripples

Fix321: Sand with ripples

Fauna Description:
Fix318: No visible fauna

Fix321: No visible fauna

Fix: 10 **E:** 241824 **N:** 6057879 **Depth:** 6m

Fix: 10 **E:** 241824 **N:** 6057879 **Retention:** MF

Station: TCC_61
Sediment Description:
Grab: Silty sand

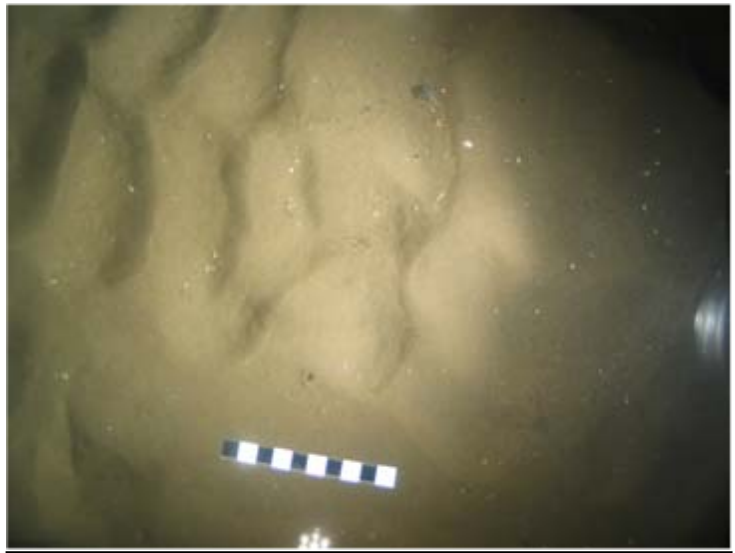
Sieve: Shell and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Echinodermata - Echinoidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 327 **E:** 243168 **N:** 6057927 **Depth:** 10m

Fix: 329 **E:** 243166 **N:** 6057931 **Depth:** 10m

Station: TCC_62
Sediment Description:
Fix327: Sand with ripples

Fix329: Sand with ripples

Fauna Description:
Fix327: No visible fauna

Fix329: Other - Chordata - Soleidae

Fix: 11 **E:** 243208 **N:** 6057939 **Depth:** 10m

Fix: 11 **E:** 243208 **N:** 6057939 **Retention:** MF

Station: TCC_62
Sediment Description:
Grab: Silty sand

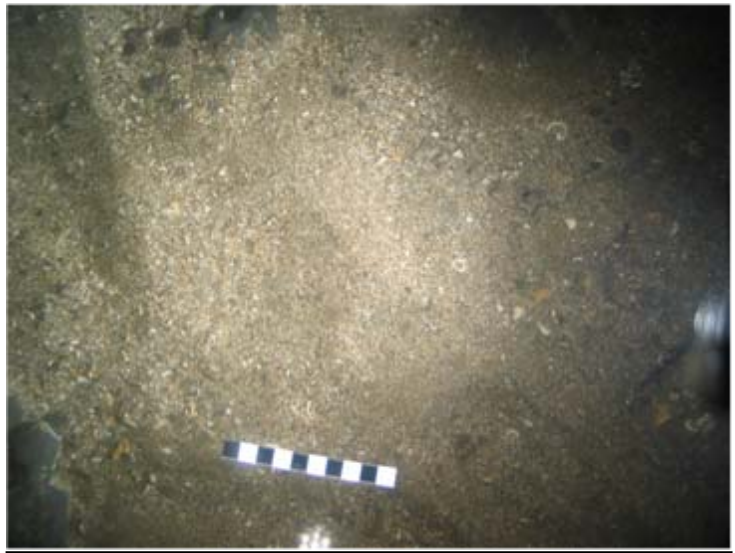
Sieve: Shell, shell fragments and gravel

Fauna Description:
Grab: No visible fauna

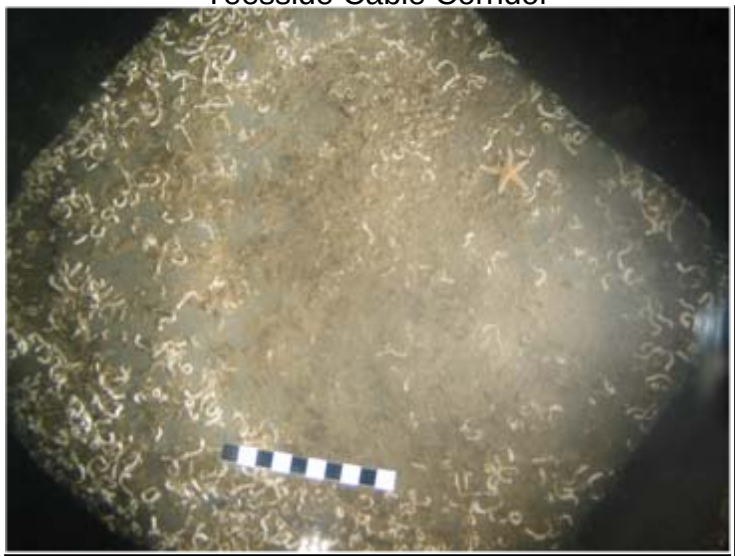
Sieve: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - Echinoidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 336 **E:** 244081 **N:** 6058282 **Depth:** 16m



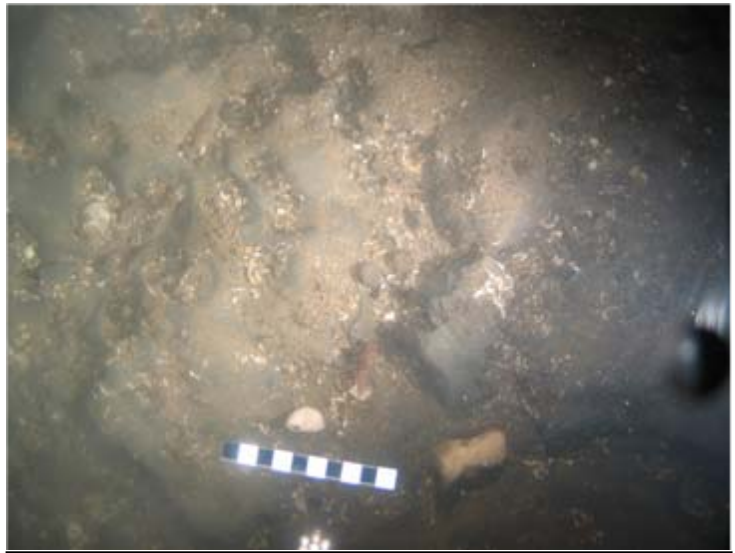
Fix: 337 **E:** 244081 **N:** 6058276 **Depth:** 14m

Station: TCC_63
Sediment Description:
Fix336: Gravelly sand with cobbles

Fix337: Boulder

Fauna Description:
Fix336: Annelida (Polychaeta) - *Spirobranchus* sp.

Fix337: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) – Cirripedia, Echinodermata - *Asterias rubens*, Asteroidea juv.



Fix: 341 **E:** 244082 **N:** 6058280 **Depth:** 15m

Fix: 345 **E:** 244075 **N:** 6058277 **Depth:** 16m

Station: TCC_63
Sediment Description:
Fix341: Silty bedrock

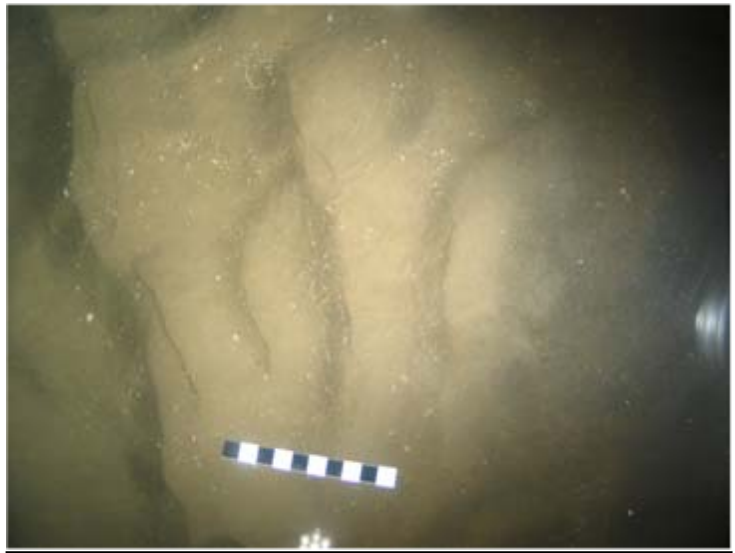
Fix345: Boulder

Fauna Description:
Fix341: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Other – Chordata - Pleuronectiformes juv., Cnidaria - *Alcyonium* sp.

Fix345: Arthropoda (Crustacea) - Cirripedia, Caridea, Other - Cnidaria - Hydrozoa, Sertulariidae, *Alcyonium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 350 **E:** 245362 **N:** 6057895 **Depth:** 15m

Fix: 353 **E:** 245356 **N:** 6057894 **Depth:** 15m

Station: TCC_64
Sediment Description:
Fix350: Sand with ripples

Fix353: Sand with ripples

Fauna Description:
Fix350: Annelida (Polychaeta) - Polychaete tubes

Fix353: No visible fauna

Fix: 12 **E:** 245401 **N:** 6057928 **Depth:** 15m

Fix: 12 **E:** 245401 **N:** 6057928 **Retention:** MF

Station: TCC_64
Sediment Description:
Grab: Silty sand

Sieve: Shell fragments

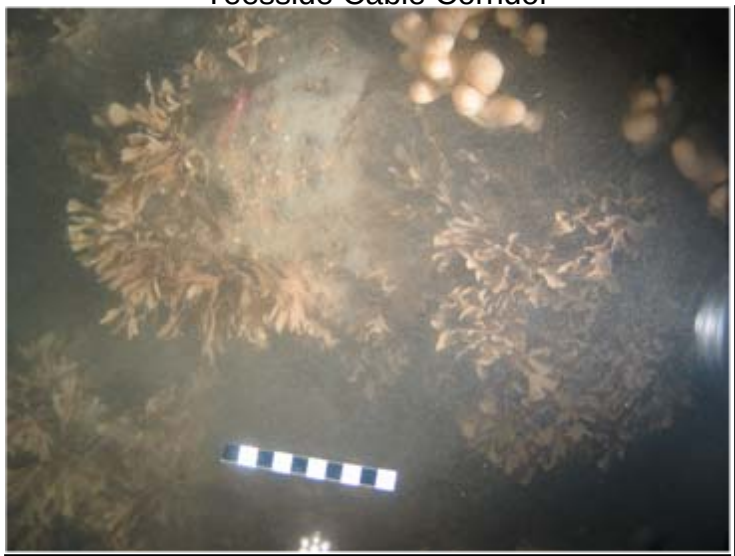
Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Echinodermata - Echinoidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 181 **E:** 246652 **N:** 6057476 **Depth:** 16m



Fix: 357 **E:** 246622 **N:** 6057452 **Depth:** 16m

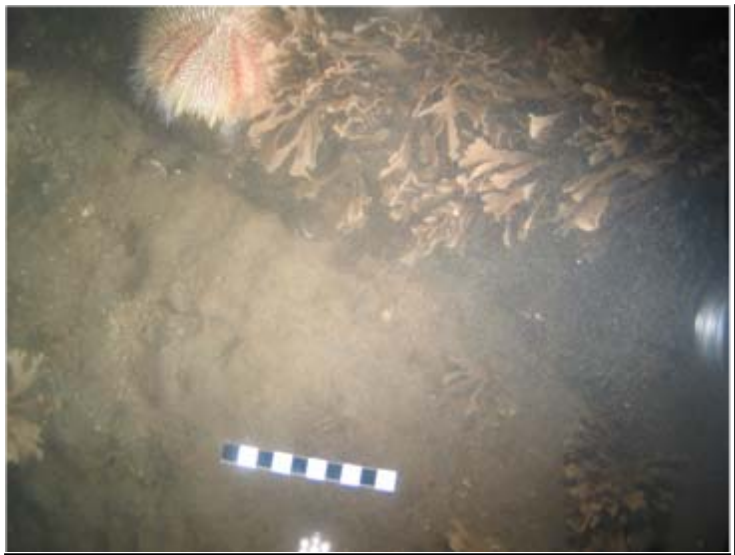
Station: TCC_65
Sediment Description:
Fix181: Boulders

Fix357: Silty bedrock

Fauna Description:
Fix181: Annelida (Polychaeta) - *Spirobranchus* sp., Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Alcyonium* sp., Hydrozoa

Fix357: Arthropoda (Crustacea) - Caridea, Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Alcyonium* sp., Porifera

Fix: 363 **E:** 246618 **N:** 6057454 **Depth:** 16m



Fix: 366 **E:** 246617 **N:** 6057454 **Depth:** 16m

Station: TCC_65
Sediment Description:
Fix363: Silty boulders

Fix366: Silty boulders

Fauna Description:
Fix363: Annelida (Polychaeta) - *Spirobranchus* sp., Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Alcyonium* sp.

Fix366: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Echinus esculentus*, Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Alcyonium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 186 **E:** 248094 **N:** 6057747 **Depth:** 26m

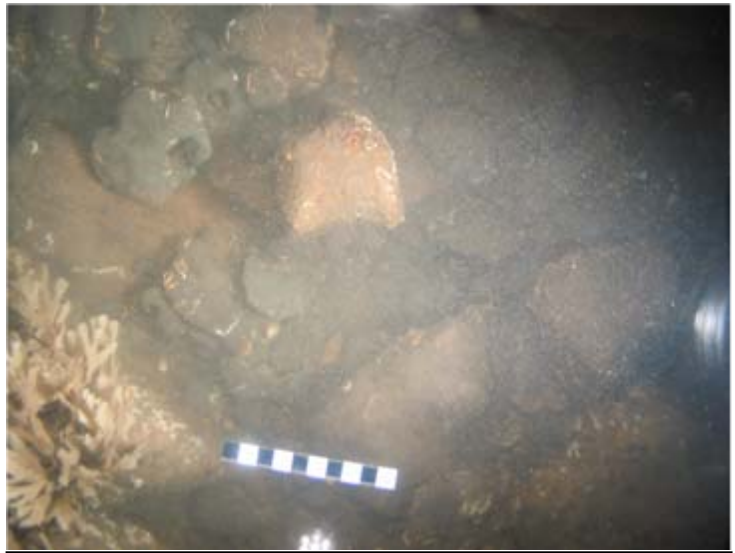
Fix: 368 **E:** 248078 **N:** 6057741 **Depth:** 26m

Station: TCC_66
Sediment Description:
Fix186: Silty gravelly bedrock

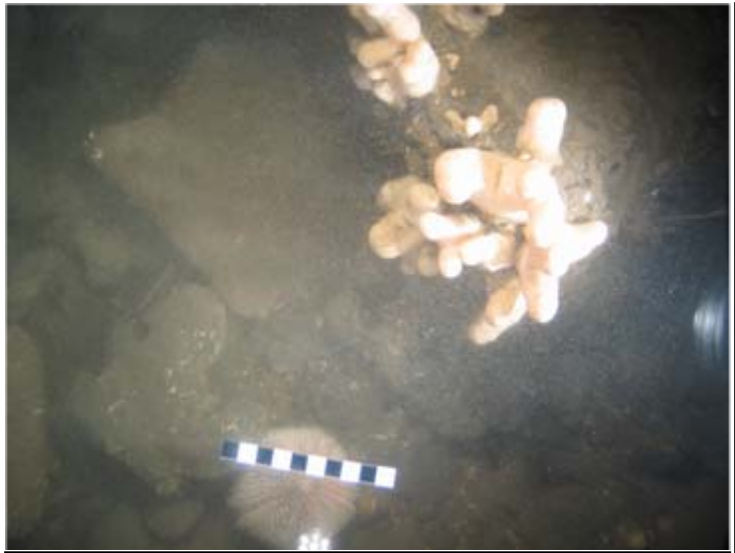
Fix368: Silty gravelly bedrock

Fauna Description:
Fix186: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiuroidea

Fix368: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Ebalia* sp.



Fix: 373 **E:** 248070 **N:** 6057745 **Depth:** 26m



Fix: 375 **E:** 248069 **N:** 6057745 **Depth:** 26m

Station: TCC_66
Sediment Description:
Fix373: Boulders

Fix375: Boulders

Fauna Description:
Fix373: Annelida (Polychaeta) - *Spirobranchus* sp., Other - Bryozoa - *Flustra foliacea*

Fix375: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Echinus esculentus*, Other - Cnidaria - Hydrozoa, *Alcyonium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 198 **E:** 249136 **N:** 6057821 **Depth:** 26m

Fix: 205 **E:** 249136 **N:** 6057820 **Depth:** 26m

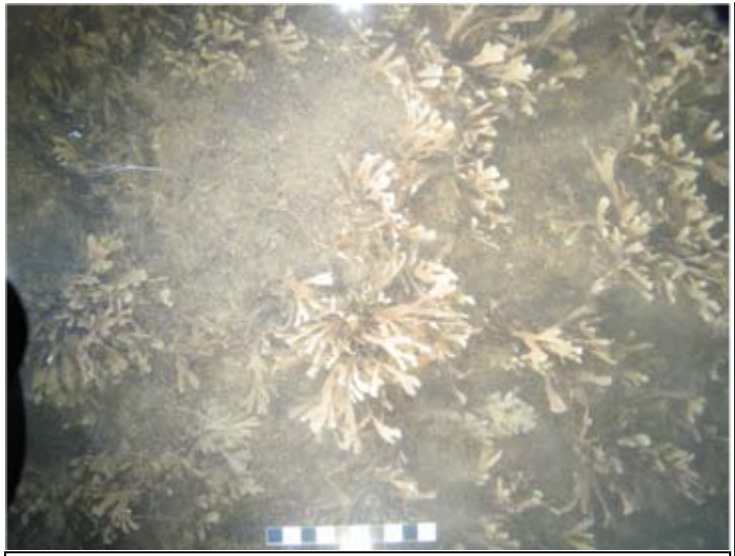
Station: TCC_67
Sediment Description:
Fix198: Sand with cobbles

Fix205: Sandy boulders

Fauna Description:
Fix198: Echinodermata - Ophiuroidea, Other - Bryozoa *Flustra foliacea*, Porifera

Fix205: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiuroidea, Other - Bryozoa - *Flustra foliacea*

Fix: 207 **E:** 249136 **N:** 6057822 **Depth:** 26m



Fix: 209 **E:** 249138 **N:** 6057819 **Depth:** 26m

Station: TCC_67
Sediment Description:
Fix207: Sandy boulders

Fix209: Gravelly sand

Fauna Description:
Fix207: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Asterias rubens*, Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Alcyonium* sp.

Fix209: Echinodermata - Ophiuroidea, Other - Bryozoa - *Flustra foliacea*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 227 **E:** 251092 **N:** 6058332 **Depth:** 35m

Fix: 231 **E:** 251089 **N:** 6058338 **Depth:** 35m

Station: TCC_68
Sediment Description:
Fix227: Silty boulders

Fix231: Silty boulders

Fauna Description:
Fix227: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Galatheidae, Echinodermata - Ophiuroidea, Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Alcyonium* sp., Urchordata - Ascideacea

Fix231: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Galatheidae, Echinodermata - Ophiuroidea, *Ophiothrix fragilis*, Other - Cnidaria - *Alcyonium* sp., Hydrozoa

Fix: 235 **E:** 251092 **N:** 6058338 **Depth:** 35m

Fix: 26 **E:** 251050 **N:** 6058371 **Depth:** 35m

Station: TCC_68
Sediment Description:
Fix235: Silty boulders

Grab: Boulder

Fauna Description:
Fix235: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Asterias rubens*, Ophiuroidea, Other - Bryozoa - *Flustra foliacea,* Cnidaria - *Alcyonium* sp., Hydrozoa

Grab: Annelida (Polychaeta), Echinodermata - Ophiuroidea, Other - Cnidaria - *Alcyonium* sp., Hydrozoa

* No acceptable grab sample due to coarse seabed

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 213 **E:** 251082 **N:** 6058035 **Depth:** 31m

Fix: 215 **E:** 251083 **N:** 6058034 **Depth:** 31m

Station: TCC_69
Sediment Description:
Fix213: Silty gravelly bedrock

Fix215: Silty gravelly bedrock

Fauna Description:
Fix213: Echinodermata - Ophiuroidea, *Ophiothrix fragilis*, Other - Cnidaria - *Alcyonium* sp.

Fix215: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiuroidea, Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Alcyonium* sp.

Fix: 219 **E:** 251085 **N:** 6058037 **Depth:** 31m

Fix: 222 **E:** 251087 **N:** 6058034 **Depth:** 31m

Station: TCC_69
Sediment Description:
Fix219: Silty gravelly bedrock

Fix222: Silty gravelly bedrock

Fauna Description:
Fix219: Annelida (Polycheata) - *Spirobranchus* sp., Echinodermata - Ophiuroidea, *Ophiothrix fragilis* Other - Cnidaria - *Alcyonium* sp.

Fix222: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiuroidea, *Ophiothrix fragilis*, *Asterias rubens,* Other - Cnidaria - *Alcyonium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 239 **E:** 252869 **N:** 6059137 **Depth:** 38m

Fix: 241 **E:** 252869 **N:** 6059139 **Depth:** 38m

Station: TCC_70
Sediment Description:
Fix239: Silty gravelly bedrock

Fix241: Silty gravelly bedrock

Fauna Description:
Fix239: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Asterias rubens*, Ophiuroidea, *Ophiothrix fragilis*, Other - Cnidaria - *Alcyonium* sp.

Fix241: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiuroidea, Other - Bryozoa - *Flustra foliacea*

Fix: 245 **E:** 252871 **N:** 6059140 **Depth:** 38m

Fix: 251 **E:** 252875 **N:** 6059143 **Depth:** 38m

Station: TCC_70
Sediment Description:
Fix245: Silty gravel with cobbles

Fix251: Silty gravel with cobbles

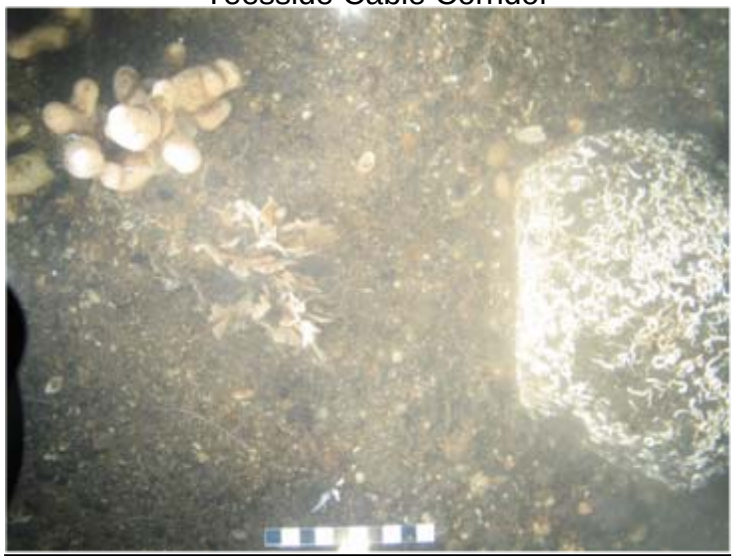
Fauna Description:
Fix245: Arthropoda (Crustacea) – Caridea, Echinodermata - Ophiuroidea

Fix251: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiuroidea, Other - Cnidaria - Hydrozoa

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 254 **E:** 255139 **N:** 6059121 **Depth:** 46m



Fix: 256 **E:** 255140 **N:** 6059120 **Depth:** 46m

Station: TCC_71
Sediment Description:
Fix254: Gravelly sand

Fix256: Silty gravel with cobbles

Fauna Description:
Fix254: No visible fauna

Fix256: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Echinodermata - Ophuiroidea, *Ophiothrix fragilis*, Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Alcyonium* sp.

Fix: 31 **E:** 255096 **N:** 6059095 **Depth:** 46m

Fix: 31 **E:** 255096 **N:** 6059095 **Retention:** MF

Station: TCC_71
Sediment Description:
Grab: Mixed sediment

Sieve: Shell, shell fragments and pebbles

Fauna Description:
Grab: No visible fauna

Sieve: No visible fauna

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 267 **E:** 258225 **N:** 6060042 **Depth:** 46m

Fix: 273 **E:** 258232 **N:** 6060050 **Depth:** 46m

Station: TCC_72
Sediment Description:
Fix267: Sandy gravelly bedrock

Fix273: Sandy gravel with cobbles

Fauna Description:
Fix267: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropda (Crustacea) - Caridea, Galatheidae, Echinodermata - Ophiuroidea, *Echinus esculentus*, Other - Bryozoa - *Flustra foliacea*, Cnidaria - Sertulariidae, Hydrozoa

Fix273: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Paguridae, Mollusca – Bivalvia, Echindermata - Ophiuroidea

Fix: 275 **E:** 258235 **N:** 6060049 **Depth:** 46m

Fix: 279 **E:** 258234 **N:** 6060052 **Depth:** 46m

Station: TCC_72
Sediment Description:
Fix275: Silty boulders

Fix279: Sandy gravel with cobbles

Fauna Description:
Fix275: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiuroidea, *Ophiothrix fragilis*, Asteroidea, Other - Cnidaria - *Alcyonium* sp., Hydrozoa, Sertulariidae

Fix279: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Echinodermata - *Ophiocomina nigra*, Ophiuroidea, Other - Cnidaria - *Thuiaria thuja*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 283 **E:** 260443 **N:** 6060408 **Depth:** 48m

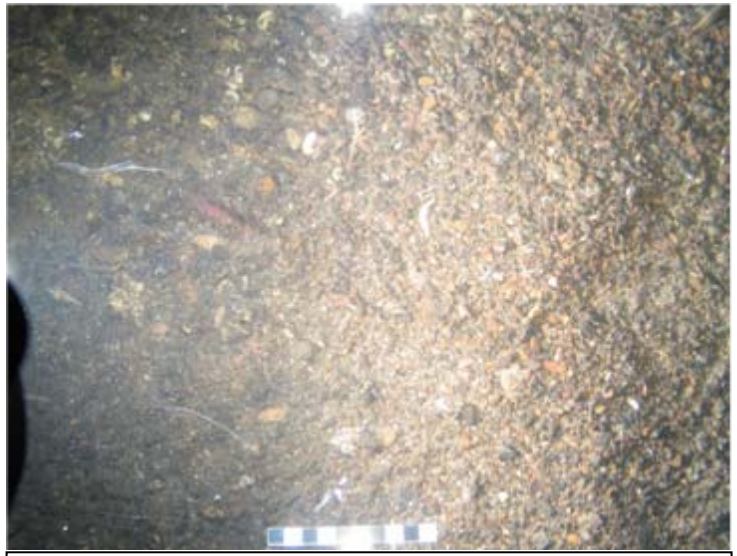
Fix: 286 **E:** 260440 **N:** 6060408 **Depth:** 48m

Station: TCC_73
Sediment Description:
Fix283: Silty gravel

Fix286: Silty gravel

Fauna Description:
Fix283: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Echinodermata - Ophiuroidea

Fix286: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Ebalia* sp., Echinodermata – Ophiuroidea, Other - Cnidaria - Hydrozoa



Fix: 289 **E:** 260443 **N:** 6060411 **Depth:** 48m

Fix: 295 **E:** 260444 **N:** 6060413 **Depth:** 48m

Station: TCC_73
Sediment Description:
Fix289: Silty gravel

Fix295: Silty gravel

Fauna Description:
Fix289: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Paguridae, Echinodermata - Ophiuroidea, Other - Cnidaria - Hydrozoa, *Thuiaria thuja*

Fix295: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophuiroidea, Cnidaria - *Alcyonium* sp., Hydrozoa, Urchodata - Ascidiacea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 298 **E:** 264251 **N:** 6059141 **Depth:** 51m

Fix: 300 **E:** 264249 **N:** 6059142 **Depth:** 51m

Station: TCC_74
Sediment Description:
Fix298: Silty gravel with cobbles

Fix300: Silty gravelly bedrock

Fauna Description:
Fix298: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiuroidea, Other - Cnidaria - Hydrozoa

Fix300: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Ophiuroidea, Other - Cnidaria - Hydrozoa, *Thuiaria thuja*, Sertulariidae

Fix: 303 **E:** 264251 **N:** 6059143 **Depth:** 51m

Fix: 307 **E:** 264252 **N:** 6059142 **Depth:** 51m

Station: TCC_74
Sediment Description:
Fix303: Silty gravel with cobbles

Fix307: Gravelly sand

Fauna Description:
Fix303: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Ophiothrix fragilis*, Ophiuroidea, Cnidaria - Hydrozoa

Fix307: Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 379 **E:** 264964 **N:** 6059828 **Depth:** 54

Fix: 383 **E:** 264964 **N:** 6059830 **Depth:** 54

Station: TCC_75
Sediment Description:
Fix379: Sand with shell

Fix383: Sand with shell

Fauna Description:
Fix379: Echinodermata - Ophiuroidea

Fix383: No visible fauna

Fix: 387 **E:** 264966 **N:** 6059832 **Depth:** 54

Fix: 17 **E:** 264943 **N:** 6059920 **Depth:** 54

Station: TCC_75*
Sediment Description:
Fix387: Fine sand

Grab*: Mixed sediment

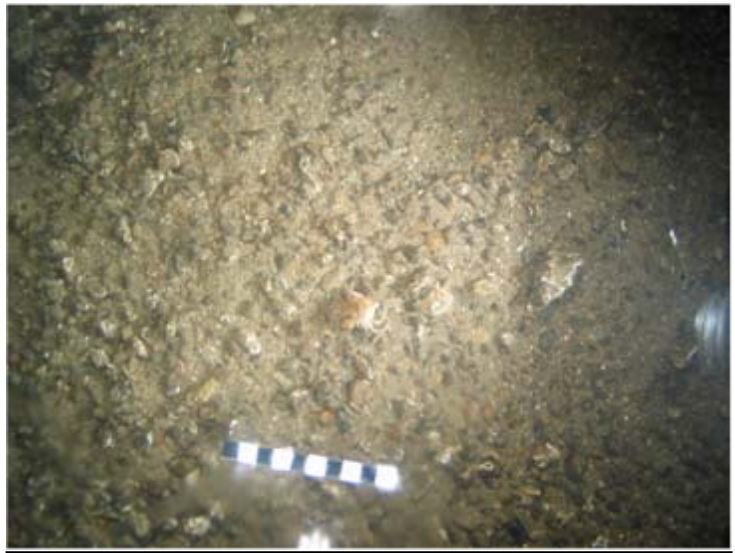
Fauna Description:
Fix387: Annelida (Polychaeta) - *Spirobranchus* sp.

Grab*: No visible fauna

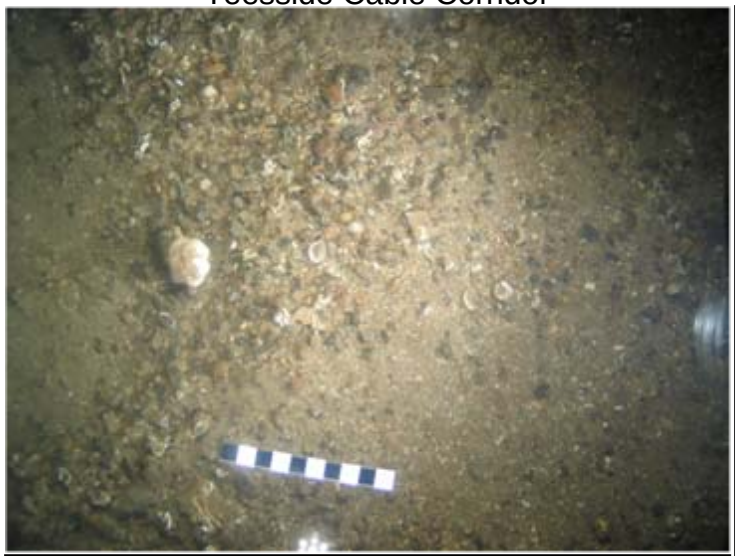
* No sieve photo taken at the time of sampling

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 393 **E:** 267225 **N:** 6059554 **Depth:** 55m



Fix: 398 **E:** 267225 **N:** 6059555 **Depth:** 55m

Station: TCC_76
Sediment Description:
Fix393: Sandy gravel

Fix398: Sandy gravel

Fauna Description:
Fix393: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Paguridae

Fix398: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiuroidea, Other - Cnidaria - *Alcyonium* sp.

Fix: 15 **E:** 267206 **N:** 6059509 **Depth:** 54m

Fix: 15 **E:** 267206 **N:** 6059509 **Retention:** MF

Station: TCC_76
Sediment Description:
Grab: Mixed sediment

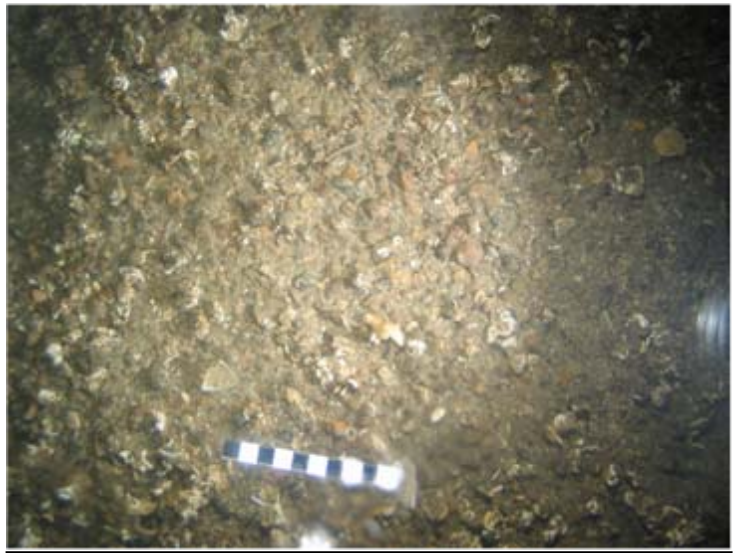
Sieve: Pebbles, gravel, shell and shell fragments

Fauna Description:
Grab: Echinodermata - Echinoidea

Sieve: Annelida (Polychaeta), Echinodermata - Ophiuroidea, Echinoidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 404 **E:** 268953 **N:** 6060137 **Depth:** 54m

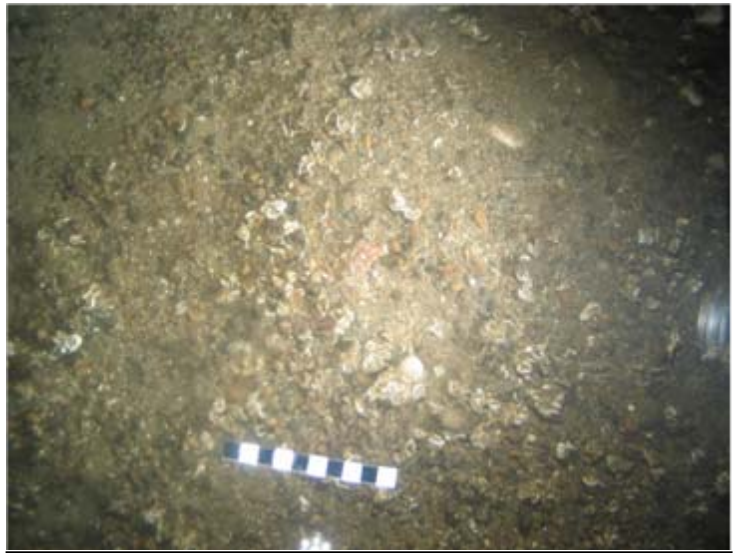
Fix: 407 **E:** 268956 **N:** 6060133 **Depth:** 54m

Station: TCC_77
Sediment Description:
Fix404: Sandy gravel

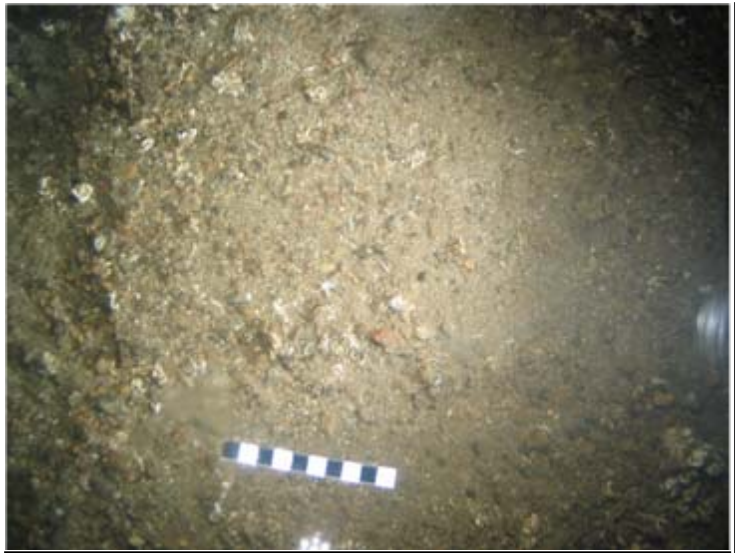
Fix407: Sandy gravel

Fauna Description:
Fix404: Annelida (Polychaeta) - Polychaete tubes, *Spirobranchus* sp., Echinodermata - Ophiuroidea, Other - Cnidaria - Hydrozoa

Fix407: Annelida (Polychaeta) - Polychaete tubes, *Spirobranchus* sp., Arthropoda (Crustacea) - Paguridae, Echinodermata - *Asterias rubens*, Other - Cnidaria - Hydrozoa



Fix: 411 **E:** 268954 **N:** 6060138 **Depth:** 54m



Fix: 412 **E:** 268956 **N:** 6060139 **Depth:** 54m

Station: TCC_77
Sediment Description:
Fix411: Sandy gravel

Fix412: Sandy gravel

Fauna Description:
Fix411: Annelida (Polychaeta) - Polychaete tubes, *Spirobranchus* sp., Arthropoda (Crustacea) - Galatheidae, Echinodermata - Ophiuroidea, Echinoidea, Other - Cnidaria - *Alcyonium* sp.

Fix412: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Asterias rubens*, Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 376 **E:** 270622 **N:** 6063256 **Depth:** 57m

Fix: 385 **E:** 270622 **N:** 6063256 **Depth:** 57m

Station: TCC_78
Sediment Description:
Fix376: Sand with ripples and shell fragments

Fix385: Sand with ripples and shell fragments

Fauna Description:
Fix376: Other - Cnidaria - *Alcyonium* sp.

Fix385: No visible fauna

Fix: 35 **E:** 270639 **N:** 6063227 **Depth:** 57m

Fix: 35 **E:** 270639 **N:** 6063227 **Retention:** MF

Station: TCC_78
Sediment Description:
Grab: Fine to medium sand with many shell fragments, some gravel and pebbles

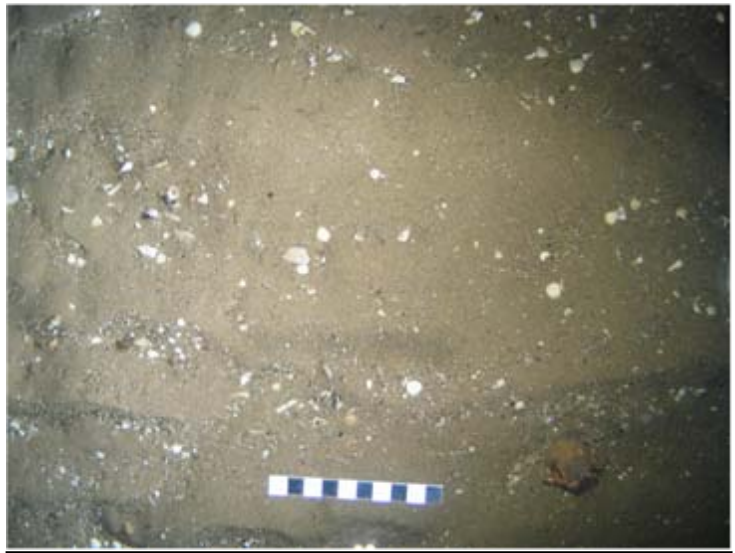
Sieve: Shell fragments and gravel

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaeta, *Spirobranchus* sp., Mollusca - Scaphapoda

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 392 **E:** 274153 **N:** 6063035 **Depth:** 58m

Fix: 401 **E:** 274153 **N:** 6063035 **Depth:** 58m

Station: TCC_79
Sediment Description:
Fix392: Sand with ripples, fines and shell fragments

Fix401: Sand with ripples, fines and shell fragments

Fauna Description:
Fix392: Arthropoda (Crustacea) - Paguridae

Fix401: No visible fauna

Fix: 32 **E:** 274160 **N:** 6063016 **Depth:** 58m

Fix: 32 **E:** 274160 **N:** 6063016 **Retention:** MF

Station: TCC_79
Sediment Description:
Grab: Fine to medium sand with shell fragments

Sieve: Shell and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Mollusca – Bivalvia, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 408 **E:** 275075 **N:** 6063055 **Depth:** 58m

Fix: 416 **E:** 275075 **N:** 6063055 **Depth:** 58m

Station: TCC_80
Sediment Description:
Fix408: Sand with shell, shell fragments and fines

Fix416: Sand with shell, shell fragments and fines

Fauna Description:
Fix408: Mollusca – Scaphopoda, Other - Cnidaria - Actiniaria, *Alcyonium* sp.

Fix416: Annelida (Polychaeta) - Polychaete tubes, *Spirobranchus* sp., Other - Cnidaria - *Alcyonium* sp., *Tubularia* sp., Hydrozoa

Fix: 30 **E:** 275086 **N:** 6063044 **Depth:** 58m

Fix: 30 **E:** 275086 **N:** 6063044 **Retention:** MF

Station: TCC_80
Sediment Description:
Grab: Fine to medium sand with numerous shell fragments

Sieve: Shell and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - Polychaete tubes

Sieve: Annelida (Polychaeta) - Polychaeta, Polychaete tubes, *Spirobranchus* sp., Mollusca - *Scaphapoda* sp., Echinodermata - Spatangoida

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 421 **E:** 275657 **N:** 6063256 **Depth:** 56m

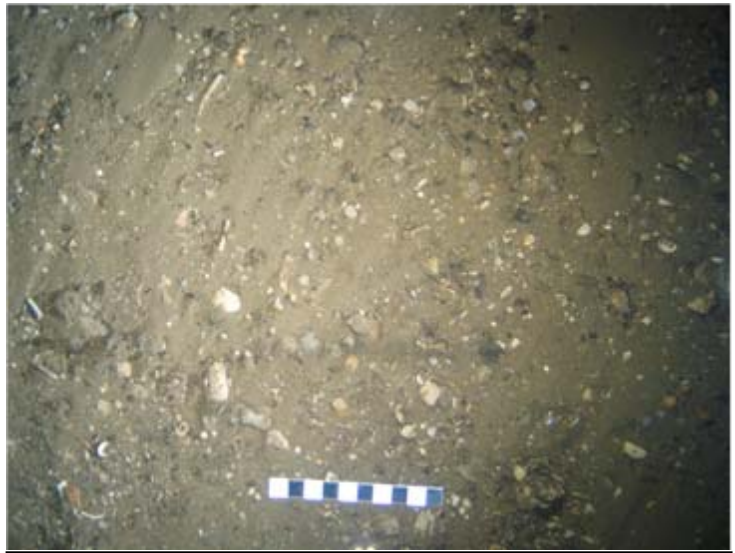
Fix: 431 **E:** 275657 **N:** 6063256 **Depth:** 56m

Station: TCC_81
Sediment Description:
Fix421: Sand with shell, shell fragments and fines

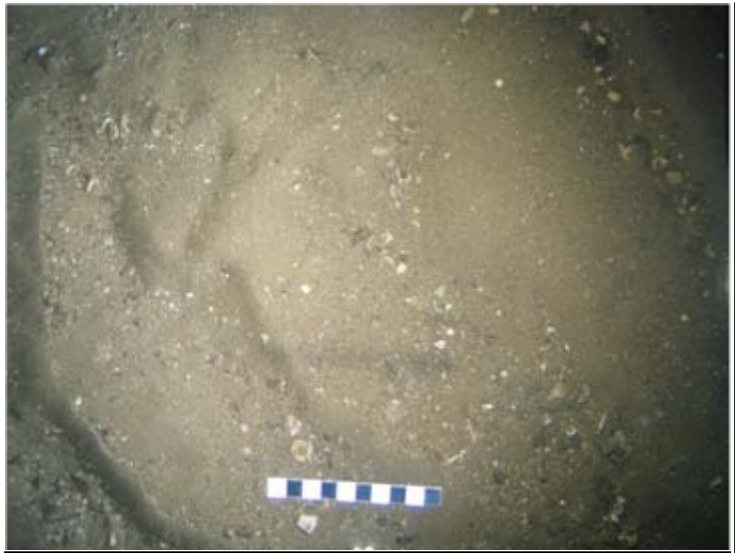
Fix431: Sand with shell, shell fragments and fines

Fauna Description:
Fix421: Annelida (Polychaeta), Arthropoda (Crustacea) - *Caridea* sp., Mollusca, Other - Cnidaria - *Alcyonium* sp., *Tubularia* sp.

Fix431: Annelida (Polychaeta), Other - Cnidaria - *Alcyonium* sp.



Fix: 427 **E:** 275657 **N:** 6063256 **Depth:** 56m



Fix: 435 **E:** 275657 **N:** 6063256 **Depth:** 56m

Station: TCC_81
Sediment Description:
Fix427: Sand with shell, shell fragments and fines

Fix435: Sand with ripples and some shell fragments

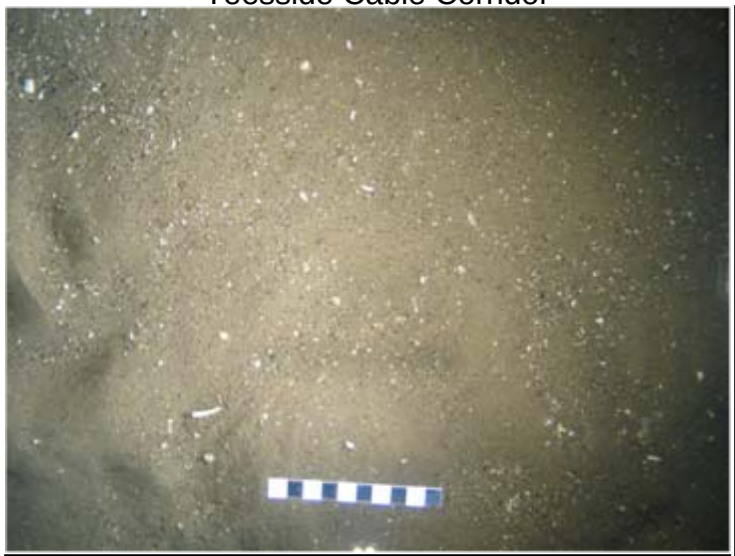
Fauna Description:
Fix427: Mollusca - Scaphopoda

Fix435: No visible fauna

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 465 **E:** 279849 **N:** 6063517 **Depth:** 59m



Fix: 476 **E:** 279849 **N:** 6063517 **Depth:** 59m

Station: TCC_82
Sediment Description:
Fix465: Sand with some shell fragments

Fix476: Sand with ripples and some shell fragments

Fauna Description:
Fix465: Annileda (Polychaeta) - Nephtyidae

Fix476: No visible fauna

Fix: 37 **E:** 279838 **N:** 6063504 **Depth:** 59m

Fix: 37 **E:** 279838 **N:** 6063504 **Retention:** MF

Station: TCC_82
Sediment Description:
Grab: Fine to medium sand with shell fragments

Sieve: Shell, shell fragments and some gravel

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes, Mollusca - Bivalvia, Solenidae, Scaphapoda, Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 444 **E:** 280571 **N:** 6063717 **Depth:** 56m

Fix: 449 **E:** 280571 **N:** 6063717 **Depth:** 56m

Station: TCC_83
Sediment Description:
Fix444: Sand with cobbles

Fix449: Sand with shell, shell fragments, gravel and cobbles and boulder

Fauna Description:
Fix444: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata – Ophiuroidea, Other - Cnidaria - Sertulariidae, *Abietinaria* sp.

Fix449: Annelida (Polychaeta), Echinodermata - *Echinus esculentus*, Other - Cnidaria - Hydrozoa, Sertulariidae, Actiniaria

Fix: 452 **E:** 280571 **N:** 6063717 **Depth:** 56m

Fix: 461 **E:** 280571 **N:** 6063717 **Depth:** 56m

Station: TCC_83
Sediment Description:
Fix452: Sand with ripples with shell fragments overlying cobbles

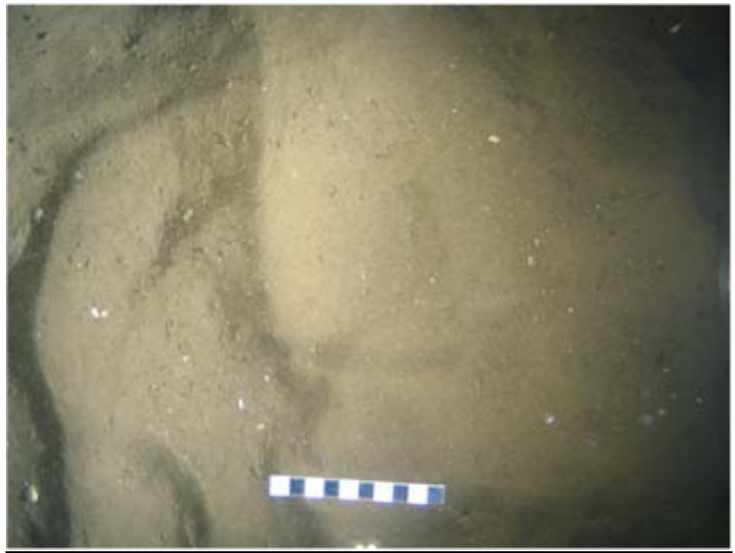
Fix461: Boulders overlying sand

Fauna Description:
Fix452: Annelida (Polychaeta) - Polychaeta tubes

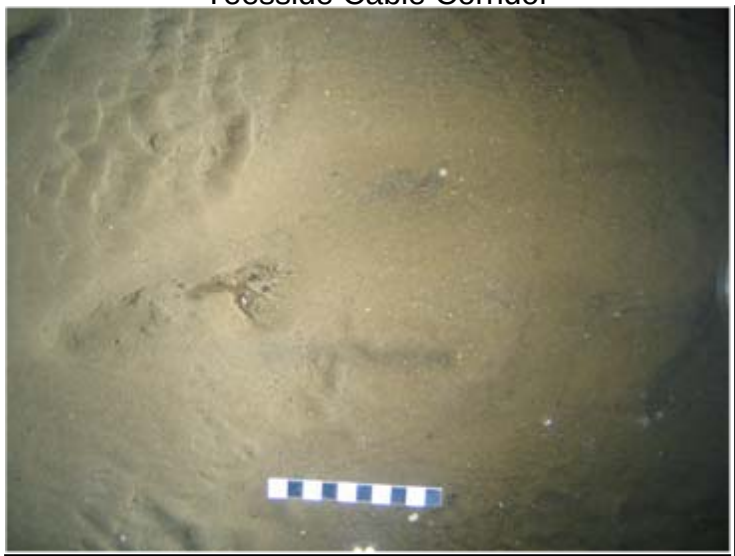
Fix461: Annelida (Polychaeta) - Polychaeta tubes, Other - Cnidaria - Actiniaria, Hydrozoa

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 482 **E:** 284583 **N:** 6065021 **Depth:** 61m



Fix: 487 **E:** 284583 **N:** 6065021 **Depth:** 61m

Station: TCC_84
Sediment Description:
Fix482: Sand with ripples

Fix487: Sand with ripples

Fauna Description:
Fix482: Annelida (Polychaete) - Polychaete tubes

Fix487: Other - Cnidaria - Hydrozoa

Fix: 43 **E:** 284569 **N:** 6065048 **Depth:** 61m

Fix: 43 **E:** 284569 **N:** 6065048 **Retention:** MF

Station: TCC_84
Sediment Description:
Grab: Fine to medium sand with shell fragments

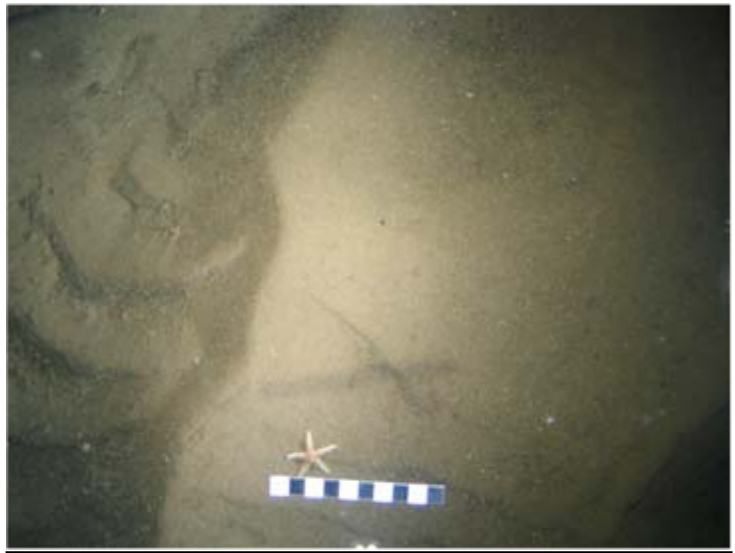
Sieve: Occasional shell fragments

Fauna Description:
Grab: No visible fauna

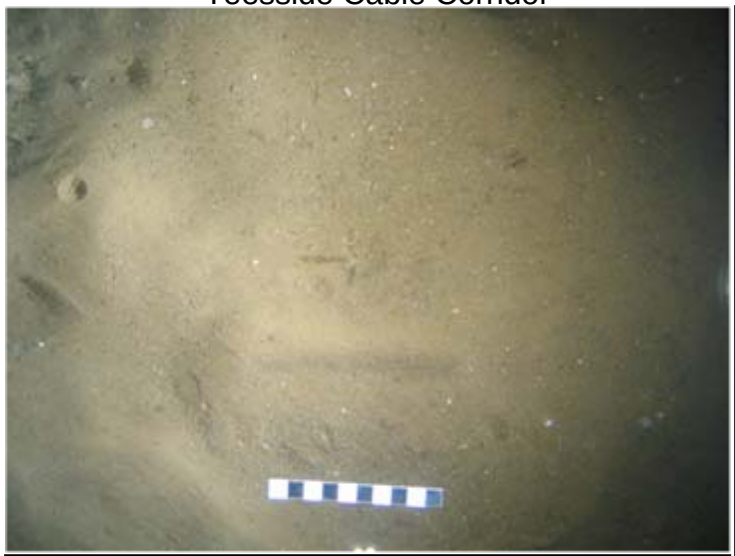
Sieve: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 491 **E:** 286188 **N:** 6065242 **Depth:** 66m



Fix: 495 **E:** 286188 **N:** 6065242 **Depth:** 66m

Station: TCC_85
Sediment Description:
Fix491: Sand with ripples

Fix495: Sand with ripples

Fauna Description:
Fix491: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Asterias rubens*

Fix495: Annelida (Polychaeta) - Polychaete tubes

Fix: 38 **E:** 286159 **N:** 6065255 **Depth:** 65m

Fix: 38 **E:** 286159 **N:** 6065255 **Retention:** MF

Station: TCC_85
Sediment Description:
Grab: Fine to medium sand with shell fragments

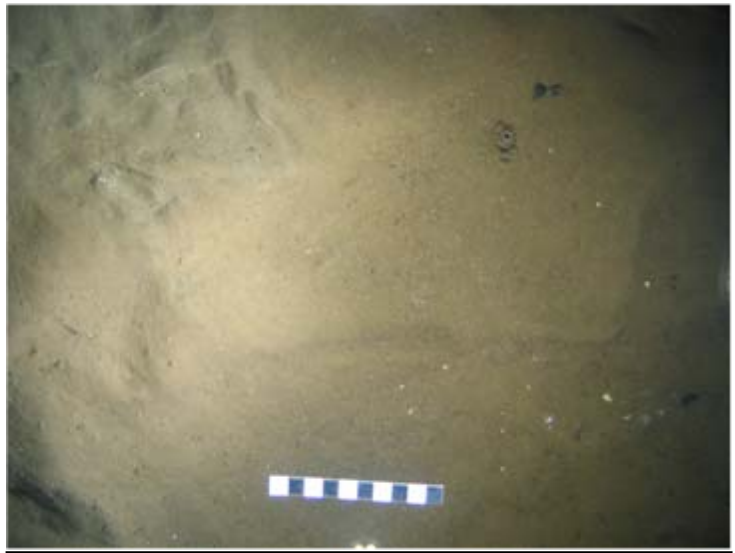
Sieve: Occasional shell fragments

Fauna Description:
Grab: No visible fauna

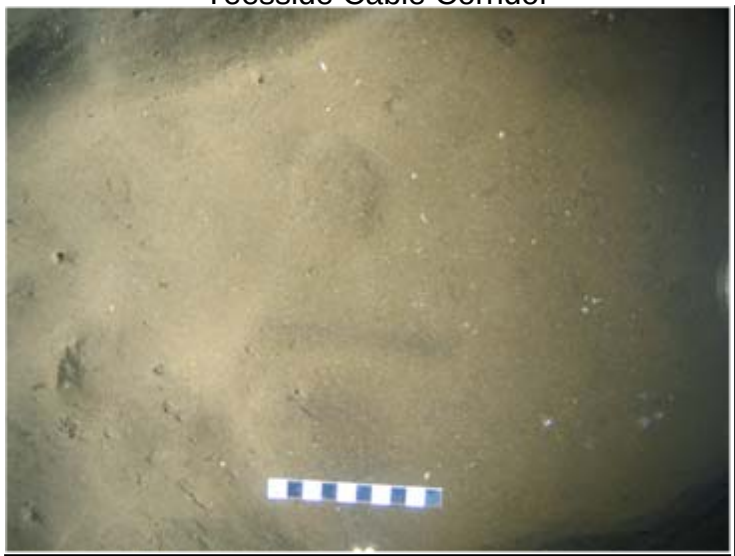
Sieve: Annelida (Polychaeta), Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 501 **E:** 291664 **N:** 6065743 **Depth:** 67m



Fix: 508 **E:** 291664 **N:** 6065743 **Depth:** 67m

Station: TCC_86
Sediment Description:
Fix501: Sand with ripples

Fix508: Sand with ripples

Fauna Description:
Fix501: Annelida (Polychaeta) - Polychaete tubes, Other - Cnideria - *Pennatula phosphorea*

Fix508: No visible fauna

Fix: 45 **E:** 291618 **N:** 6065741 **Depth:** 67m

Fix: 45 **E:** 291618 **N:** 6065741 **Retention:** MF

Station: TCC_86
Sediment Description:
Grab: Fine sand

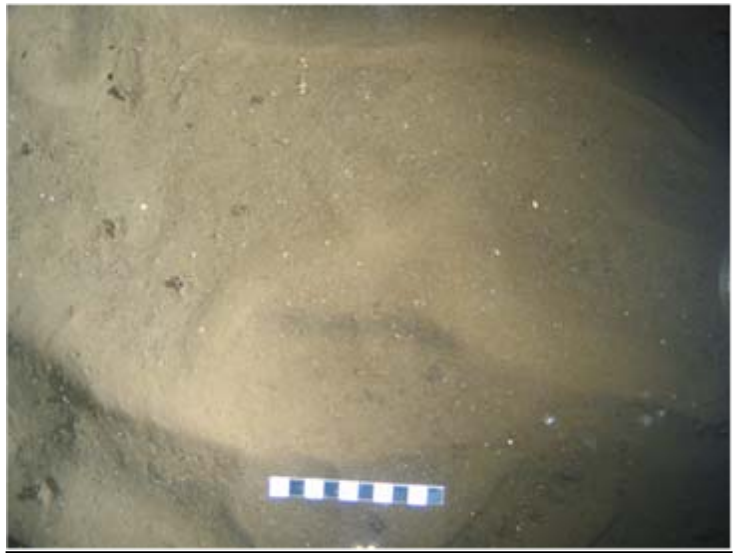
Sieve: Occasional shell fragments

Fauna Description:
Grab: No visible fauna

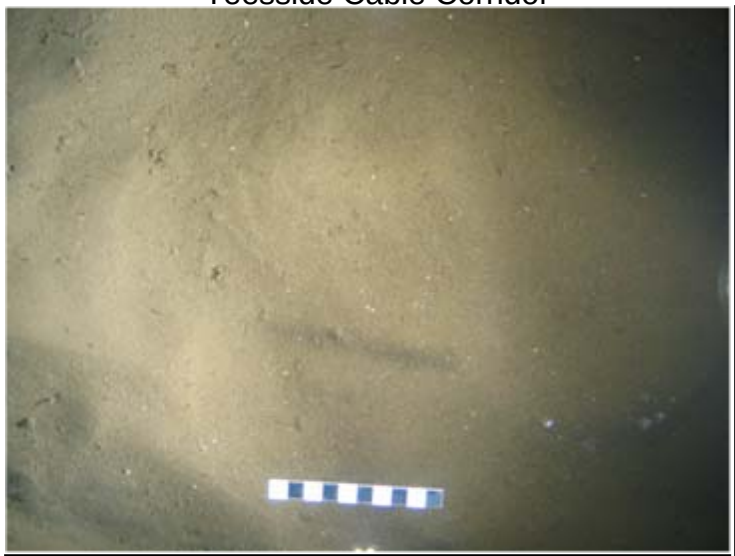
Sieve: Annelida (Polychaeta), Mollusca - Bivalvia, Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 516 **E:** 300631 **N:** 6066887 **Depth:** 63m



Fix: 524 **E:** 300631 **N:** 6066887 **Depth:** 63m

Station: TCC_87
Sediment Description:
Fix516: Sand

Fix524: Sand

Fauna Description:
Fix516: Annelida (Polychaeta) - Polychaete tubes

Fix524: Echinodermata - Ophiuroidea

Fix: 48 **E:** 300600 **N:** 6066907 **Depth:** 62m

Fix: 48 **E:** 300600 **N:** 6066907 **Retention:** MF

Station: TCC_87
Sediment Description:
Grab: Fine to medium sand with some fines

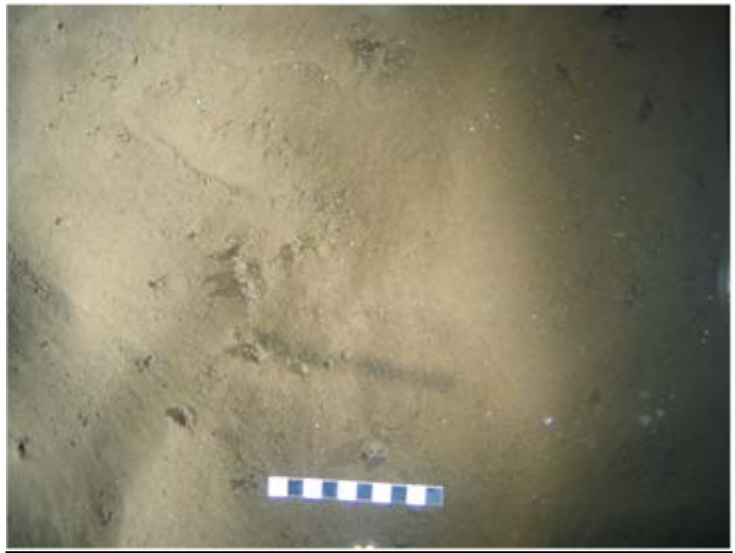
Sieve: Some shell fragments and gravel

Fauna Description:
Grab: No visible fauna

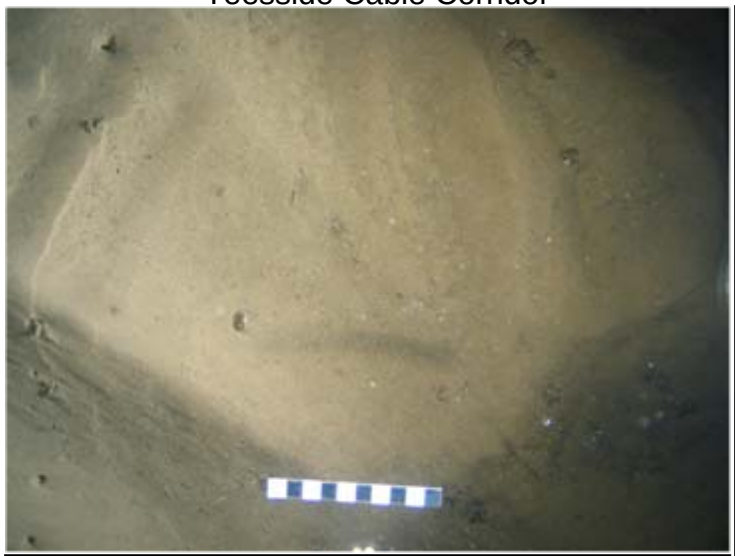
Sieve: Annelida (Polychaeta) - Polychaeta, Polychaete tubes, Mollusca - Bivalvia, Echinodermata - *Echinocardium* sp., Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 526 **E:** 304783 **N:** 6066706 **Depth:** 71m



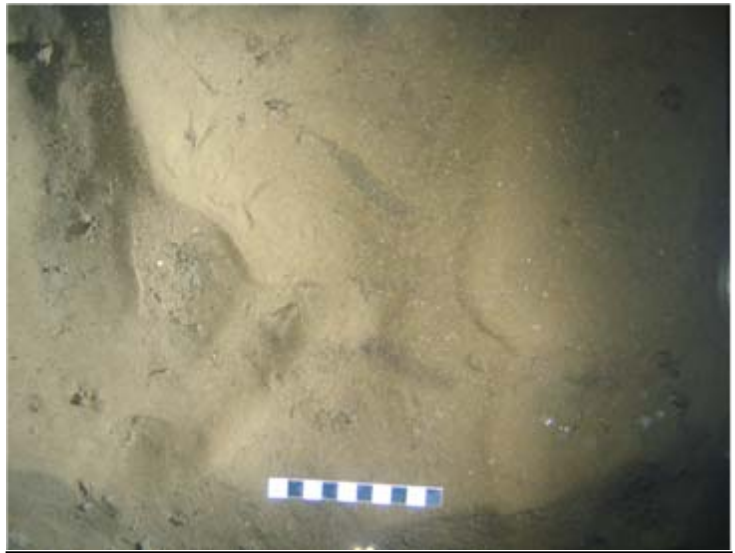
Fix: 535 **E:** 304783 **N:** 6066706 **Depth:** 71m

Station: TCC_88
Sediment Description:
Fix526: Sand

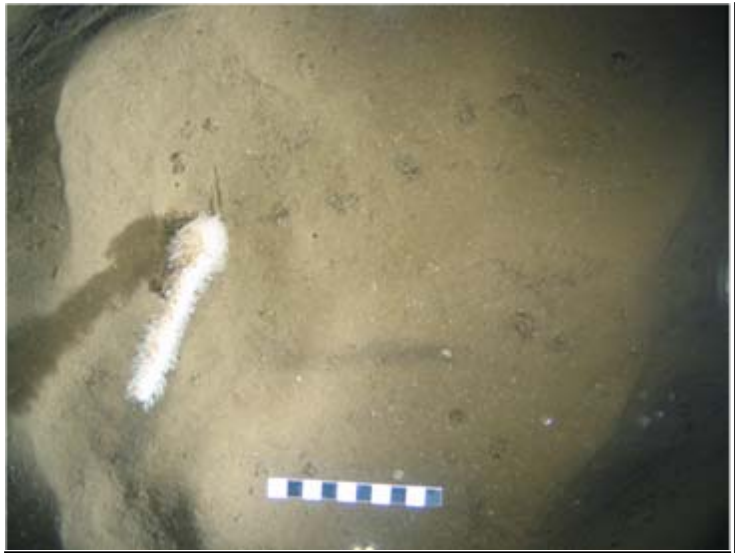
Fix535: Sand, with some bioturbation

Fauna Description:
Fix526: Annelida (Polychaeta) - Polychaete tubes, Other - Foraminifera - *Astrorhiza* sp.

Fix535: Annelida (Polychaeta) - Polychaete tubes, Other - Foraminifera - *Astrorhiza* sp.



Fix: 529 **E:** 304783 **N:** 6066706 **Depth:** 71m



Fix: 532 **E:** 304783 **N:** 6066706 **Depth:** 71m

Station: TCC_88
Sediment Description:
Fix529: Sand

Fix532: Sand

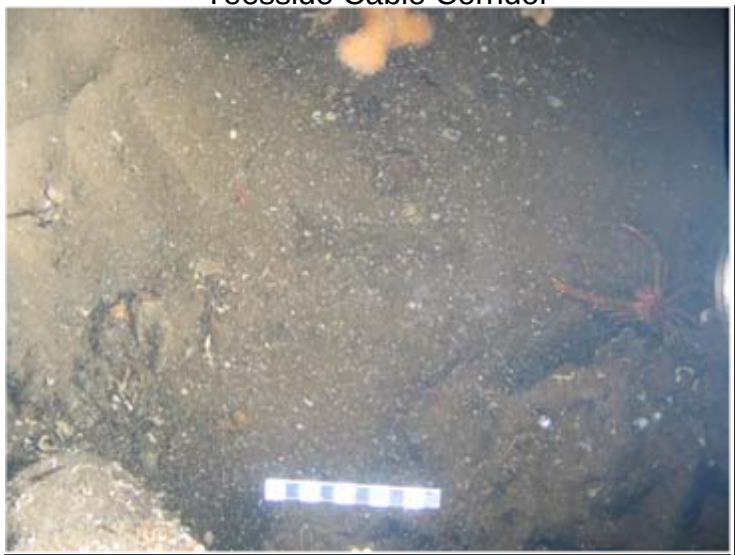
Fauna Description:
Fix529: Annelida (Polychaeta) - Polychaete tubes, Other - Foraminifera - *Astrorhiza* sp.

Fix532: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Alcyonium* sp., Foraminifera - *Astrorhiza* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 541 **E:** 307342 **N:** 6066746 **Depth:** 71m



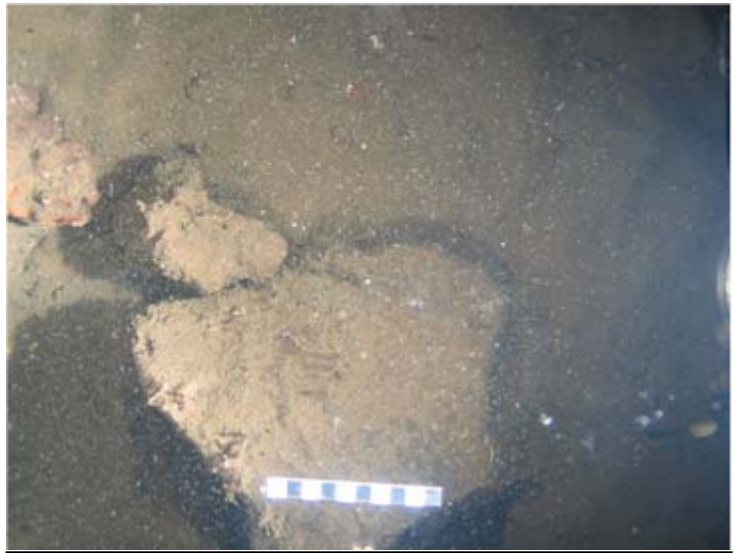
Fix: 555 **E:** 307330 **N:** 6066740 **Depth:** 71m

Station: TCC_89
Sediment Description:
Fix541: Fine to medium sand, shell fragments and some coarse sediment

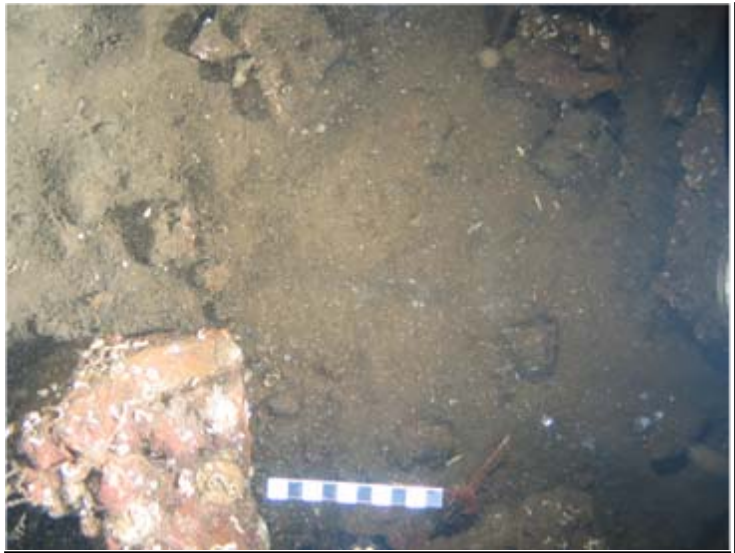
Fix555: Fine to medium sand with sand ripples, shell fragments, patches of coarse sediments and boulders

Fauna Description:
Fix541: Arthropoda (Crustacea) - Caridea, Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Thuiaria thuja*, Sertuarliidae, *Alcyonium* sp.

Fix555: Annelida (Crustaea) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, *Munida* sp., Other - Cnidaria - *Abietinaria* sp., *Alcyonium* sp.



Fix: 565 **E:** 307325 **N:** 6066727 **Depth:** 70m



Fix: 568 **E:** 307327 **N:** 6066727 **Depth:** 71m

Station: TCC_89
Sediment Description:
Fix565: Fine to medium sand with shell fragments and boulders

Fix568: Fine to medium sand with shell fragments, patches of coarse sediment and boulders

Fauna Description:
Fix565: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Munida* sp., Echinodermata - *Ophiothrix* sp., Other - Cnidaria - Sertulariidae

Fix568: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - *Munida* sp., Echinodermata - *Ophiothrix* sp., Other - Cnidaria - Sertulariidae, *Thuiaria thuja*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 571 **E:** 309214 **N:** 6066859 **Depth:** 73m

Fix: 576 **E:** 309203 **N:** 6066841 **Depth:** 73m

Station: TCC_90
Sediment Description:
Fix571: Fine to medium sand with sand ripples

Fix576: Fine to medium sand with sand ripples

Fauna Description:
Fix571: Annelida (Polychaeta) - Polychaeta tubes, Other - Foraminifera - *Astrorhiza* sp.

Fix576: Annelida (Polychaeta) - Polychaeta tubes, Other - Foraminifera - *Astrorhiza* sp.

Fix: 53 **E:** 309217 **N:** 6066894 **Depth:** 73m

Fix: 53 **E:** 309217 **N:** 6066894 **Retention:** MF

Station: TCC_90
Sediment Description:
Grab: Fine to medium sand

Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Other – Foraminifera - *Astrorhiza* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 581 **E:** 309726 **N:** 6067801 **Depth:** 62m

Fix: 586 **E:** 309758 **N:** 6067746 **Depth:** 62m

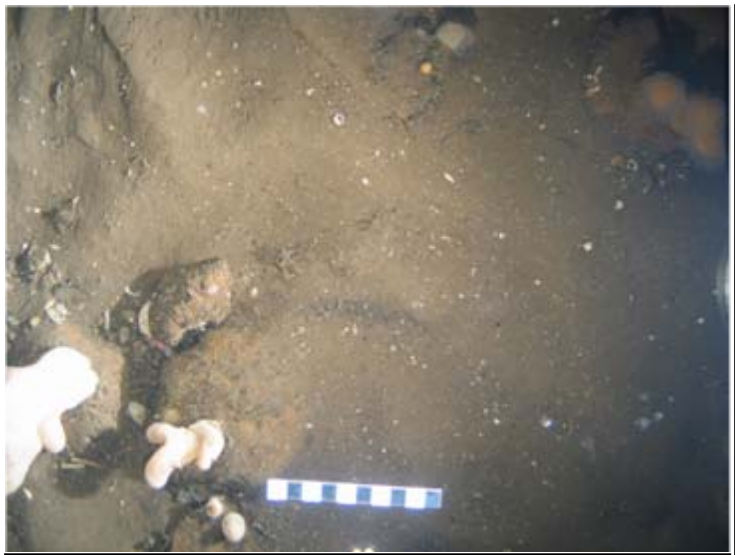
Station: TCC_91
Sediment Description:
Fix581: Fine to medium sand with sand ripples, shell fragments and underlying rock

Fix586: Fine to medium sand with sand ripples, shell fragments, boulder and cobble

Fauna Description:
Fix581: Annelida (Polychatea) - Polychaeta, Polychaete tubes, Mollusca - *Aequipecten opercularis*, Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Alcyonium* sp., Foraminifera - *Astrorhiza* sp.

Fix586: Annelida (Polychaeta) - Polychaeta, *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Other - Bryozoa - *Flustra foliacea*, Cnidaria - *Alcyonium* sp.

Fix: 590 **E:** 309742 **N:** 6067780 **Depth:** 62m



Fix: 594 **E:** 309736 **N:** 6067778 **Depth:** 62m

Station: TCC_91
Sediment Description:
Fix590: Fine to coarse sand with shell fragments, gravel, cobbles and boulders

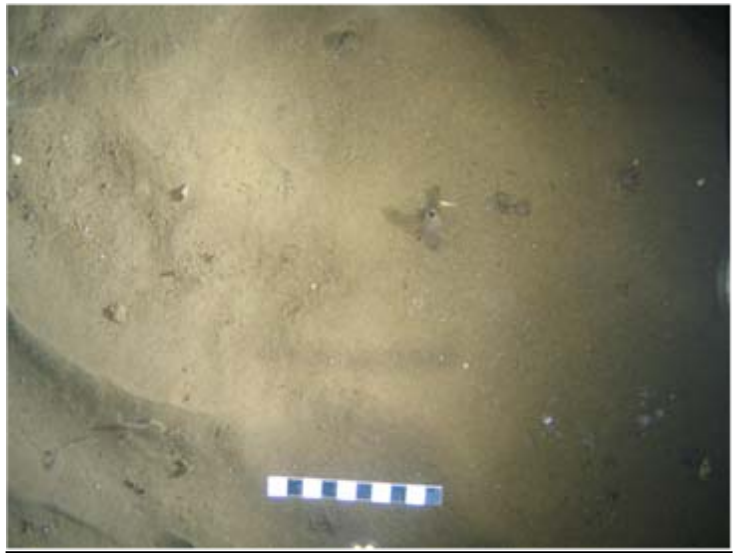
Fix594: Fine to medium sand with sand ripples, shell fragments and cobbles

Fauna Description:
Fix590: Annelida (Polychaeta) - Polychaeta, *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Other - Bryozoa, Cnidaria - Hydrozoa, *Alcyonium* sp.

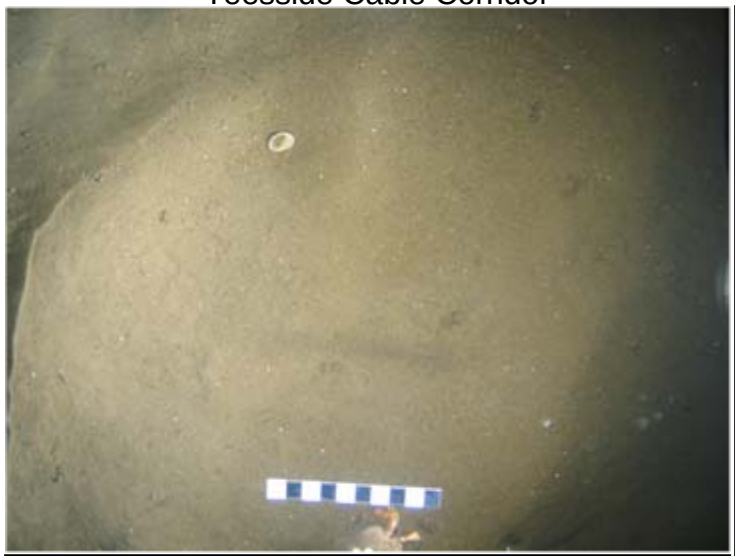
Fix594: Annelida (Polychaeta) - Polychaeta, *Spirobranchus* sp., Polychaete tubes, Arthropoda (Crustacea) - Caridea, Other - Cnidaria - *Alcyonium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 596 **E:** 310410 **N:** 6067815 **Depth:** 66



Fix: 599 **E:** 310400 **N:** 6067832 **Depth:** 66

Station: TCC_92
Sediment Description:
Fix596: Fine to medium sand with sand ripples

Fix599: Fine to medium sand with sand ripples

Fauna Description:
Fix596: Annelida (Polychaeta) - Polychaeta, Polychaete tubes, Other - Cnidaria - *Virgularia mirabilis*, Foraminifera - *Astrorhiza* sp.

Fix599: Annelida (Polychaeta) - Polychaeta tubes, Arthropoda (Crustacea) - Paguridae

Fix: 52 **E:** 310387 **N:** 6067824 **Depth:** 66

Fix: 52 **E:** 310387 **N:** 6067824 **Retention:** MF

Station: TCC_92
Sediment Description:
Grab: Fine to medium sand

Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Mollusca - Scaphopoda

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 607 **E:** 311176 **N:** 6067959 **Depth:** 67m

Fix: 615 **E:** 311145 **N:** 6067959 **Depth:** 67m

Station: TCC_93
Sediment Description:
Fix607: Fine to medium sand with sand ripples

Fix615: Fine to medium sand with sand ripples

Fauna Description:
Fix607: Annelida (Polychaeta) - Polychaeta, Polychaete tubes

Fix615: Annelida (Polychaeta) - Polychaeta tubes, Other - Cnidaria - *Alcyonium* sp.

Fix: 50 **E:** 311175 **N:** 6067951 **Depth:** 67m

Fix: 50 **E:** 311175 **N:** 6067951 **Retention:** MF

Station: TCC_93
Sediment Description:
Grab: Fine to medium sand

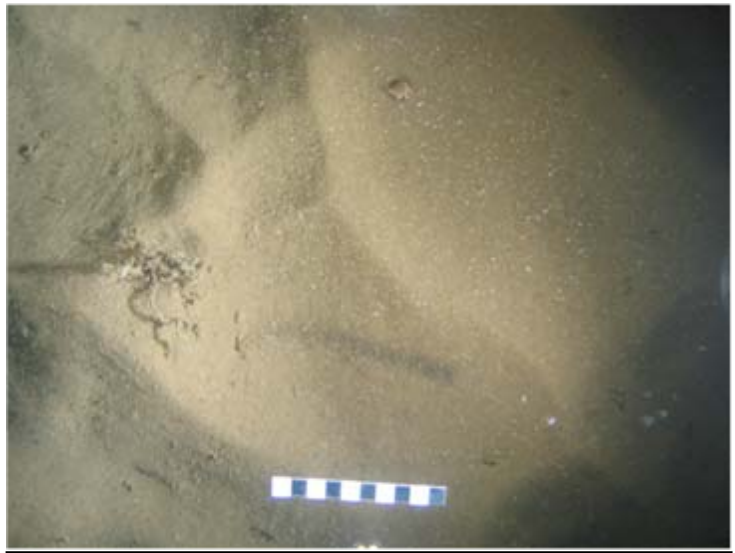
Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Mollusca - Bivalvia, Scaphapoda, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 617 **E:** 311963 **N:** 6068105 **Depth:** 71m

Fix: 623 **E:** 311942 **N:** 6068110 **Depth:** 71m

Station: TCC_94
Sediment Description:
Fix617: Fine to medium sand with sand ripples

Fix623: Fine to medium sand with sand ripples

Fauna Description:
Fix617: Arthropoda (Crustacea) - Paguridae, Other - Cnidaria - Hydrozoa

Fix623: Annelida (Polychaeta), Other - Foraminifera - *Astrorhiza* sp.

Fix: 49 **E:** 311968 **N:** 6068127 **Depth:** 71m

Fix: 49 **E:** 311968 **N:** 6068127 **Retention:** MF

Station: TCC_94
Sediment Description:
Grab: Fine to medium sand

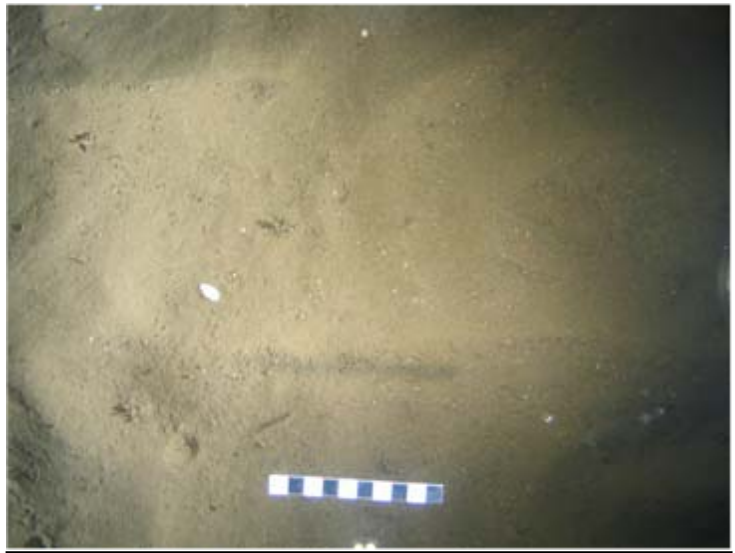
Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

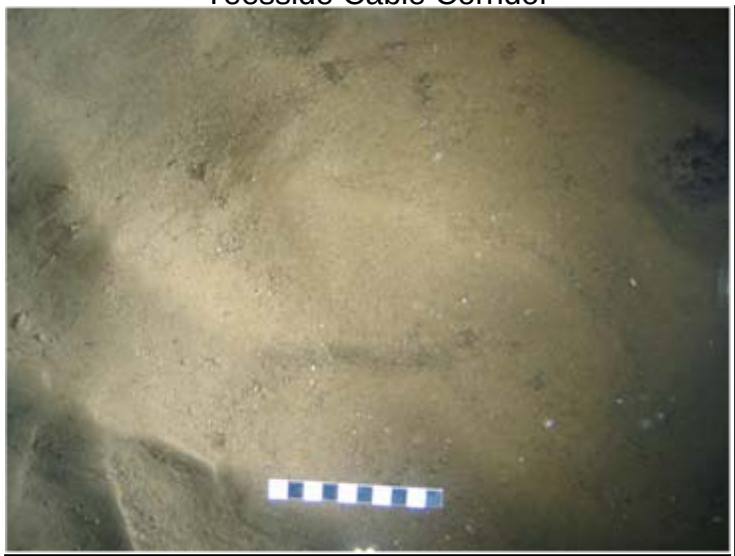
Sieve: Annelida (Polychaeta), Mollusca - Bivalvia

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 628 **E:** 314251 **N:** 6067495 **Depth:** 70m



Fix: 633 **E:** 314296 **N:** 6067498 **Depth:** 70m

Station: TCC_95
Sediment Description:
Fix628: Fine to medium sand with sand ripples

Fix633: Fine to medium sand with sand ripples

Fauna Description:
Fix628: Annelida (Polychaeta), Other - Cnidaria *Virgularia mirabilis*, Foraminifera - *Astrorhiza* sp.

Fix633: Annelida (Polychaeta), Other - Cnidaria Sertulariidae, Foraminifera - *Astrorhiza* sp.

Fix: 55 **E:** 314280 **N:** 6067472 **Depth:** 70m

Fix: 55 **E:** 314280 **N:** 6067472 **Retention:** MF

Station: TCC_95
Sediment Description:
Grab: Fine to medium sand

Sieve: Shell fragments

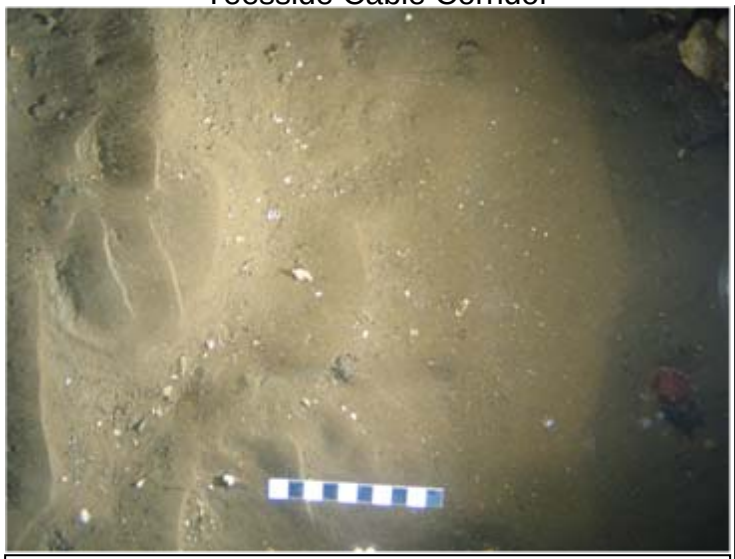
Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 640 **E:** 315608 **N:** 6068630 **Depth:** 69m



Fix: 645 **E:** 315595 **N:** 6068637 **Depth:** 69m

Station: TCC_96
Sediment Description:
Fix640: Fine to medium sand with shell fragments and cobbles with slight sand ripples

Fix645: Fine to medium sand with shell fragments and some cobbles with sand ripples

Fauna Description:
Fix640: Annelida (Polychaeta) - *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Echinodermata - *Asterias rubens*, Other - Cnidaria - *Alcyonium* sp., Sertulariidae

Fix645: Annelida (Polychaeta) - Polychaeta tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix: 647 **E:** 315583 **N:** 6068632 **Depth:** 70m

Fix: 652 **E:** 315577 **N:** 6068601 **Depth:** 70m

Station: TCC_96
Sediment Description:
Fix647: Fine to medium sand with shell fragments and cobbles with slight sand ripples

Fix652: Fine to medium sand with shell fragments and cobbles with slight sand ripples

Fauna Description:
Fix647: Annelida (Polychaeta) - Polychaeta, *Spirobranchus* sp., Other - Cnidaria - *Alcyonium* sp., Foraminifera - *Astrorhiza* sp.

Fix652: Annelida (Polychaeta), Other - Cnidaria - *Alcyonium* sp., Sertulariidae, Foraminifera - *Astrorhiza* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 658 **E:** 315941 **N:** 6068663 **Depth:** 67m

Fix: 662 **E:** 315957 **N:** 6068663 **Depth:** 67m

Station: TCC_97
Sediment Description:
Fix658: Fine to medium sand with sand ripples

Fix662: Fine to medium sand with sand ripples

Fauna Description:
Fix658: Annelida (Polychaeta) - Polychaeta, Polychaete tubes, Aphroditinae, Other - Foraminifera - *Astrorhiza* sp.

Fix662: Annelida (Polychaeta), Echinodermata - *Astropecten irregularis*, Other - Foraminifera - *Astrorhiza* sp.

Fix: 56 **E:** 315958 **N:** 6068652 **Depth:** 67m

Fix: 56 **E:** 315958 **N:** 6068652 **Retention:** MF

Station: TCC_97
Sediment Description:
Grab: Fine to medium sand

Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta)

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 670 **E:** 316333 **N:** 6068764 **Depth:** 64m

Fix: 673 **E:** 316348 **N:** 6068773 **Depth:** 64m

Station: TCC_98
Sediment Description:
Fix670: Fine to medium sand with sand ripples and some coarse sediment including cobbles

Fix673: Fine to medium sand with sand ripples and some coarse sediment including shell fragments and cobbles

Fauna Description:
Fix670: Annelida (Polychaeta), Mollusca - Scaphopoda, Other - Cnidaria - *Alcyonium* sp., Plumulariidae

Fix673: Annelida (Polychaeta) - Polychaeta, *Spirobranchus* sp., Echinodermata - Asteroidea, Other – Bryozoa, Cnidaria - Actiniaria, *Alcyonium* sp., encrusting Porifera

Fix: 677 **E:** 316346 **N:** 6068758 **Depth:** 64m

Fix: 683 **E:** 316341 **N:** 6068760 **Depth:** 64m

Station: TCC_98
Sediment Description:
Fix677: Fine to medium sand with sand ripples and coarse sediment including cobbles

Fix683: Fine to medium sand with sand ripples and coarse sediment including shell fragments and cobbles

Fauna Description:
Fix677: Annelida (Polychaeta) - Polychaeta, *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Paguridae, Other - Cnidaria - *Alcyonium* sp.

Fix683: Annelida (Polychaeta) - Polychaeta, *Spirobranchus* sp., Arthropoda (Crustacea) - Caridea, Other - Cnidaria - *Alcyonium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 691 **E:** 317507 **N:** 6068972 **Depth:** 63m

Fix: 697 **E:** 317499 **N:** 6068984 **Depth:** 63m

Station: TCC_99
Sediment Description:
Fix691: Fine to medium sand with sand ripples

Fix697: Fine to medium sand with sand ripples

Fauna Description:
Fix691: Annelida (Polychaeta) - Polychaeta, *Oxydromus flexuosus*, Polychaete tubes, Mollusca - *Aequipecten opercularis*- with possible Hydrozoa, Other - Bryozoa, - Foraminifera - *Astrorhiza* sp.

Fix697: Annelida (Polychaeta) - Polychaeta tubes, Arthropoda (Crustacea) - Paguridae, Other - Foraminifera - *Astrorhiza* sp.

Fix: 54 **E:** 317535 **N:** 6068946 **Depth:** 63m

Fix: 54 **E:** 317535 **N:** 6068946 **Retention:** MF

Station: TCC_99
Sediment Description:
Grab: Fine to medium sand

Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta)

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 702 **E:** 320941 **N:** 6069475 **Depth:** 66m

Fix: 708 **E:** 320945 **N:** 6069462 **Depth:** 66m

Station: TCC_100
Sediment Description:
Fix702: Sand with ripples

Fix708: Sand with ripples

Fauna Description:
Fix702: Annelida (Polychaeta) - Polychaete tubes, Other - Foraminifera - *Astrorhiza* sp.

Fix708: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Amphipoda, Other - Foraminifera - *Astrorhiza* sp.

Fix: 57 **E:** 320928 **N:** 6069483 **Depth:** 66m

Fix: 57 **E:** 320928 **N:** 6069483 **Retention:** MF

Station: TCC_100
Sediment Description:
Grab: Sand

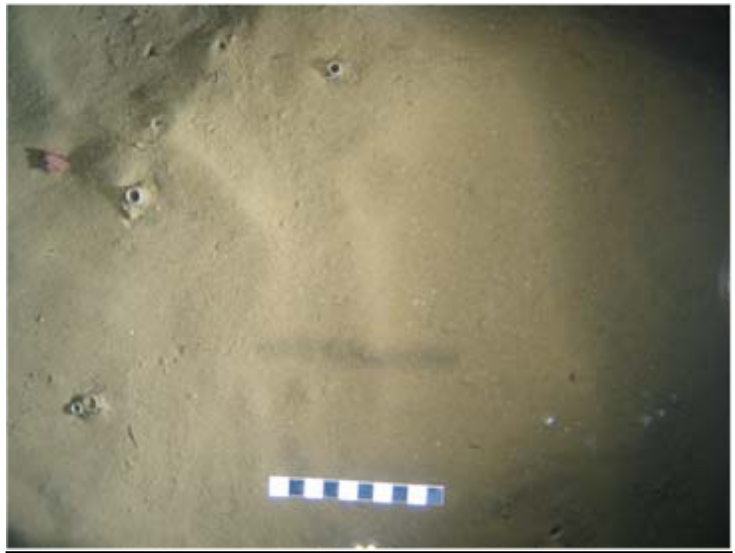
Sieve: Some shell fragments

Fauna Description:
Grab: Annelida

Sieve: Annelida, Mollusca - Scaphapoda

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 716 **E:** 326737 **N:** 6071374 **Depth:** 69m

Fix: 725 **E:** 326739 **N:** 6071345 **Depth:** 69m

Station: TCC_101
Sediment Description:
Fix716: Sand with ripples

Fix725: Sand with ripples

Fauna Description:
Fix716: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix725: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix: 59 **E:** 326739 **N:** 6071355 **Depth:** 69m

Fix: 59 **E:** 326739 **N:** 6071355 **Retention:** MF

Station: TCC_101
Sediment Description:
Grab: Sand

Sieve: Some shell fragments

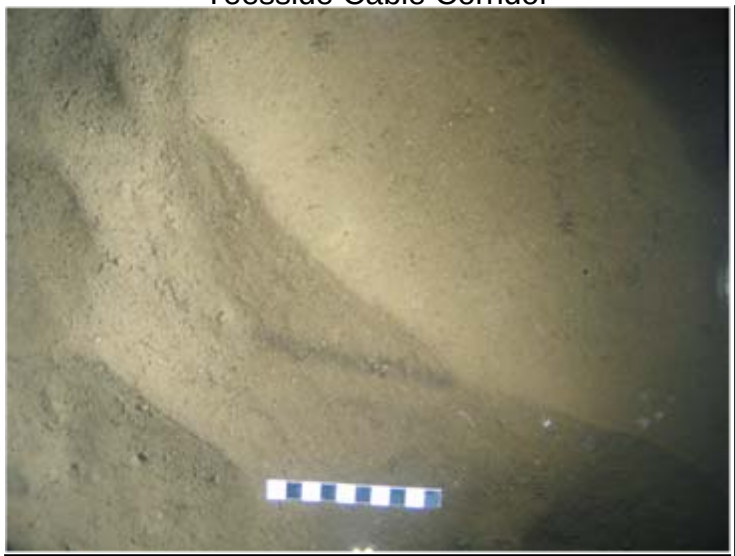
Fauna Description:
Grab: Arthropoda (Crustacea) - Brachyura

Sieve: Annelida, Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 731 **E:** 327729 **N:** 6071686 **Depth:** 72m



Fix: 736 **E:** 327752 **N:** 6071713 **Depth:** 72m

Station: TCC_102
Sediment Description:
Fix731: Sand with ripples

Fix736: Sand with ripples

Fauna Description:
Fix731: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix736: Annelida (Polychaeta) - Polychaete tubes

Fix: 58 **E:** 327759 **N:** 6071728 **Depth:** 72m

Fix: 58 **E:** 327759 **N:** 6071728 **Retention:** MF

Station: TCC_102
Sediment Description:
Grab: Sand

Sieve: Some shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta), Arthropoda (Crustacea) – Amphipoda, Mollusca - Scaphapoda, Echinodermata - *Echinocardium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 742 **E:** 336535 **N:** 6074982 **Depth:** 77m

Fix: 746 **E:** 336564 **N:** 6074970 **Depth:** 77m

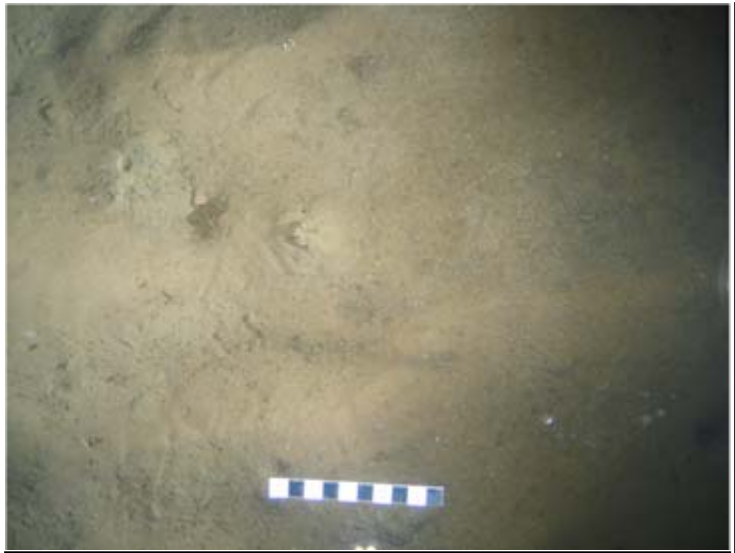
Station: TCC_103*
Sediment Description:
Fix742: Sand with ripples

Fix746: Sand with ripples

Fauna Description:
Fix742: Annelida (Polychaeta) - Polychaete tubes, other - Cnidaria - *Pennatula phosphorea*

Fix746: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*, Teleostei - Gobiidae

Fix: 748 **E:** 336565 **N:** 6074925 **Depth:** 77m



Fix: 752 **E:** 336567 **N:** 6074935 **Depth:** 77

Station: TCC_103*
Sediment Description:
Fix748: Sand with ripples

Fix752: Sand with ripples

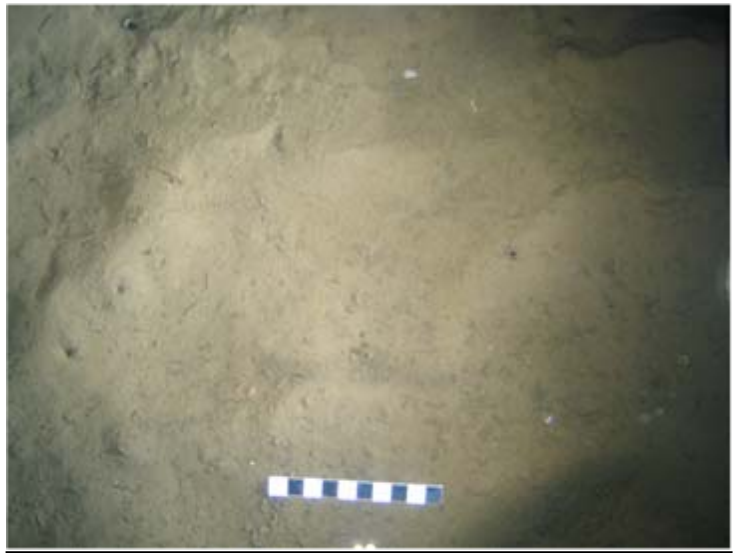
Fauna Description:
Fix748: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Alcyonium* sp., *Pennatula phosphorea*, Foraminifera - *Astrorhiza* sp.

Fix752: Annelida (Polychaete tubes)

* No grab or sieve photo available

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 753 **E:** 342461 **N:** 6074447 **Depth:** 80m

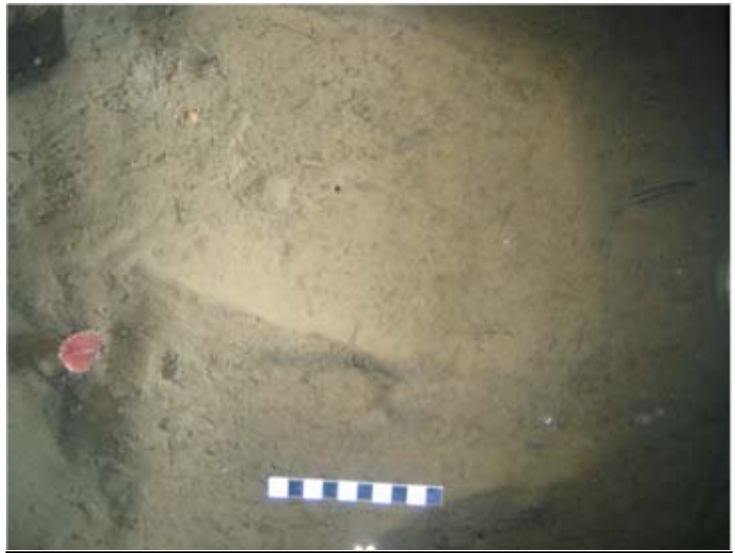
Fix: 755 **E:** 342498 **N:** 6074413 **Depth:** 80m

Station: TCC_104
Sediment Description:
Fix753: Sand with ripples

Fix755: Sand with ripples

Fauna Description:
Fix753: Annelida (Polcyhaeta) - Polychaete tubes

Fix755: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*



Fix: 757 **E:** 342502 **N:** 6074420 **Depth:** 80m

Fix: 759 **E:** 342469 **N:** 6074429 **Depth:** 80m

Station: TCC_104
Sediment Description:
Fix757: Sand with ripples

Fix759: Sand with ripples

Fauna Description:
Fix757: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - *Ebalia* sp., Other - Cnidaria - *Pennatula phosphorea*, Foraminifera - *Astrorhiza* sp.

Fix759: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 763 **E:** 343425 **N:** 6074467 **Depth:** 76m

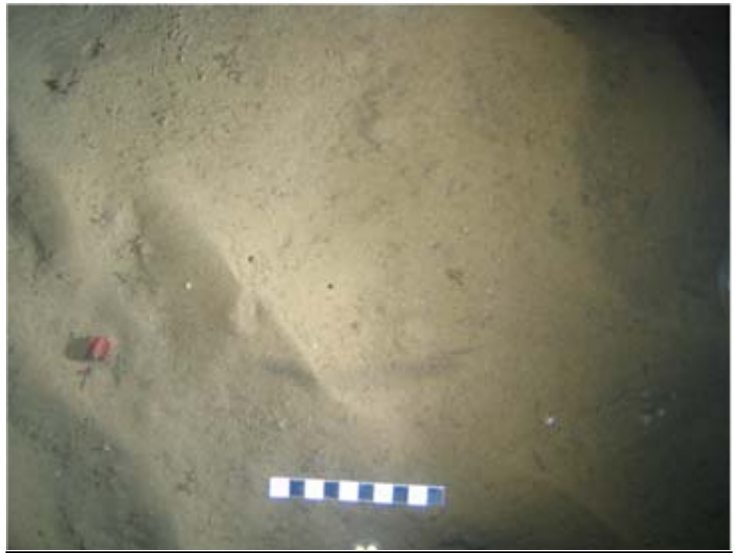
Fix: 765 **E:** 343395 **N:** 6074467 **Depth:** 76m

Station: TCC_105
Sediment Description:
Fix763: Sand with ripples

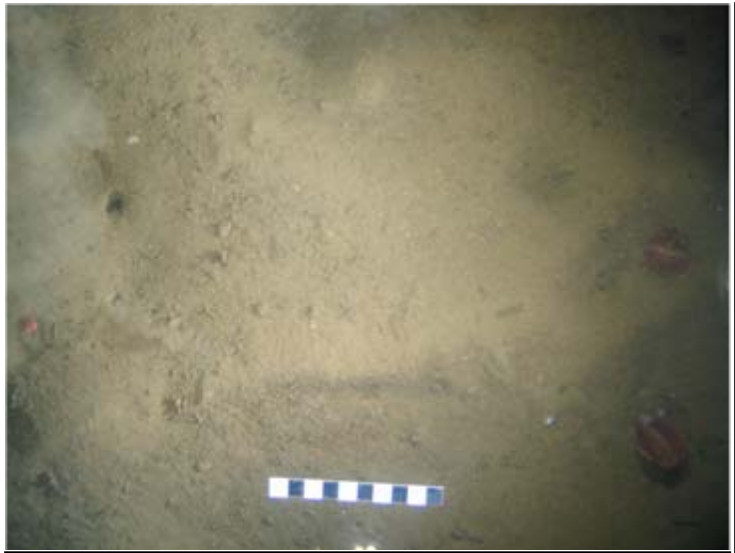
Fix765: Sand with ripples

Fauna Description:
Fix763: Annelida (Polychaeta) - Polychaete tubes, Aphroditidae

Fix765: Annelida (Polychaeta) - Polychaete tubes, Other - Foraminifera - *Astrorhiza* sp.



Fix: 766 **E:** 343387 **N:** 6074473 **Depth:** 76m



Fix: 769 **E:** 343424 **N:** 6074434 **Depth:** 76m

Station: TCC_105
Sediment Description:
Fix766: Sand with ripples

Fix769: Sand with ripples

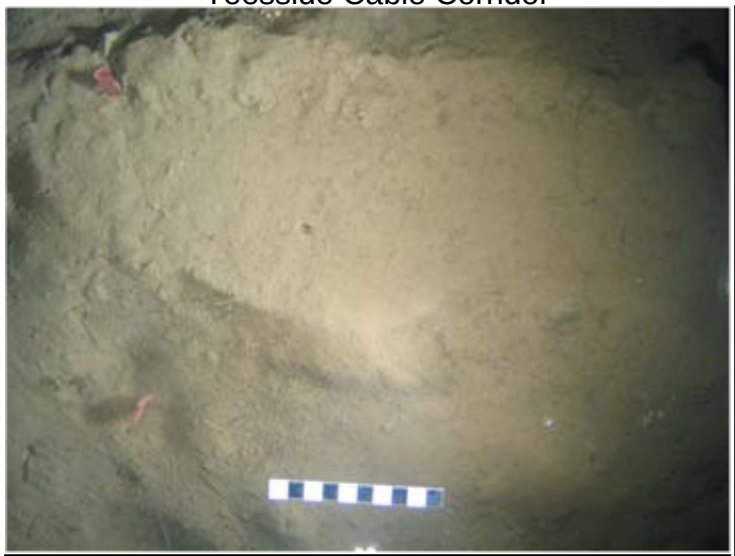
Fauna Description:
Fix766: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*, Foraminifera - *Astrorhiza* sp.

Fix769: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 771 **E:** 350197 **N:** 6075801 **Depth:** 78m



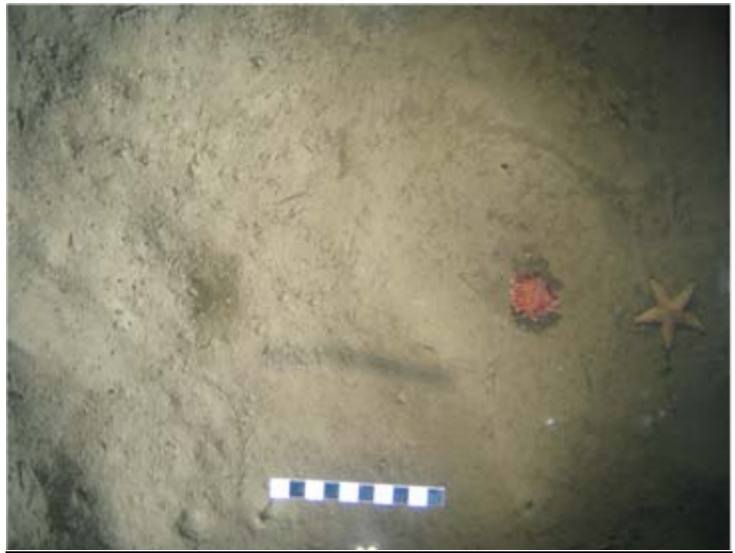
Fix: 774 **E:** 350161 **N:** 6075805 **Depth:** 78m

Station: TCC_106*
Sediment Description:
Fix771: Sand

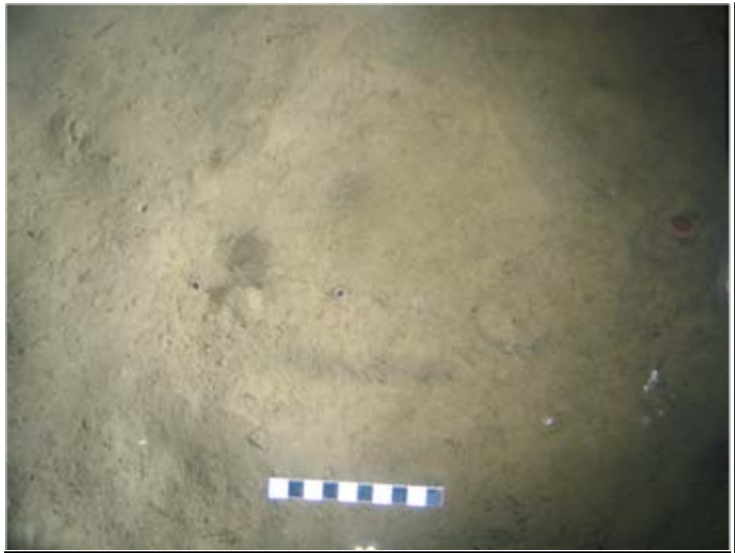
Fix774: Sand

Fauna Description:
Fix771: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*

Fix774: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*, *Epizoanthus papillosus*



Fix: 777 **E:** 350140 **N:** 6075817 **Depth:** 78m



Fix: 778 **E:** 350132 **N:** 6075824 **Depth:** 78m

Station: TCC_106*
Sediment Description:
Fix777: Sand

Fix778: Sand

Fauna Description:
Fix777: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Astropectren irregularis*, Other - Cnidaria - *Pennatula phosphorea*

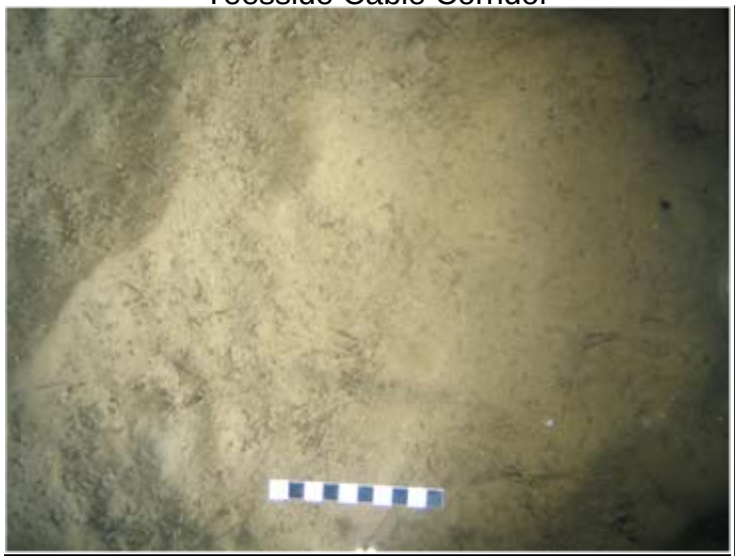
Fix778: Annelida (Polychaeta) - Polychaete tubes, Other - Cnidaria - *Pennatula phosphorea*, Foraminifera - *Astrorhiza* sp.

* No grab or sieve photo available

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 782 **E:** 351072 **N:** 6076091 **Depth:** 80m



Fix: 785 **E:** 351056 **N:** 6076103 **Depth:** 80m

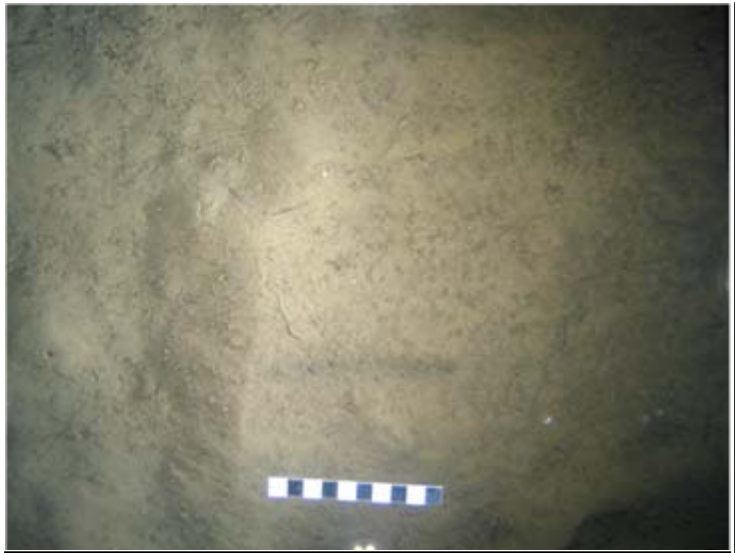
Station: TCC_107*
Sediment Description:
Fix782: Sand

Fix785: Sand

Fauna Description:
Fix782: Annelida (Polychaeta) - Polychaete tubes, Other - Chordata - Pleuronectiformes, Cnidaria - *Alcyonium* sp., *Virgularia mirabilis*

Fix785: Annelida (Polychaeta) - Polychaete tubes, Other - Foraminifera - *Astrorhiza* sp.

Fix: 789 **E:** 351053 **N:** 6076050 **Depth:** 80m



Fix: 791 **E:** 351058 **N:** 6076081 **Depth:** 80m

Station: TCC_107*
Sediment Description:
Fix789: Sand

Fix791: Sand

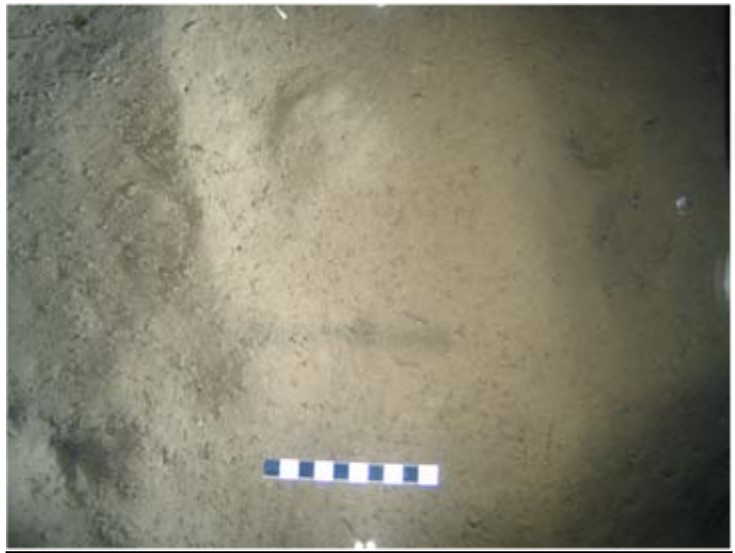
Fauna Description:
Fix789: Arthropoda (Crustacea) - Paguridae, Other - Cnidaria - *Hydractinia echinata*, Foraminifera - *Astrorhiza* sp.

Fix791: Annelida (Polychaeta) - Polychaete tubes

* No grab or sieve photo available

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 897 **E:** 359462 **N:** 6076916 **Depth:** 73m

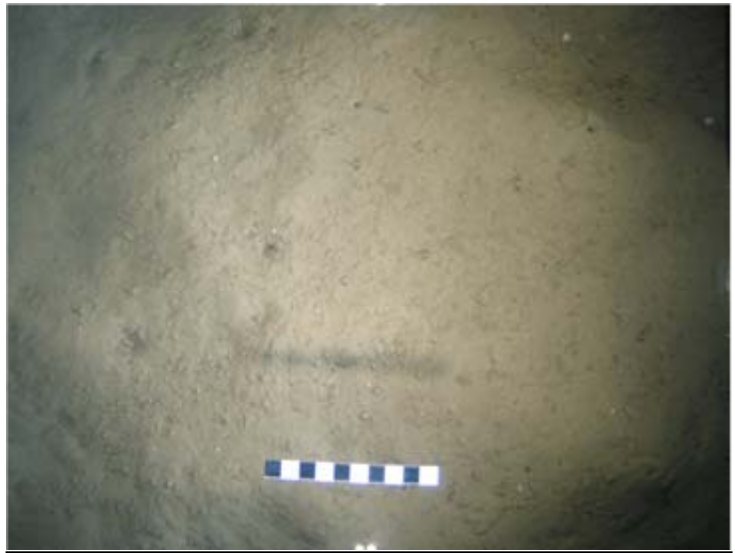
Fix: 899 **E:** 359482 **N:** 6076931 **Depth:** 73m

Station: TCC_108
Sediment Description:
Fix897: Sand

Fix899: Sand

Fauna Description:
Fix897: Annelida (Polychaeta) - Polychaete tubes

Fix899: Annelida (Polychaeta) - Polychaete tubes, *Oxydromus flexuosus*, Other - Foraminifera - *Astrorhiza* sp.



Fix: 902 **E:** 359463 **N:** 6076925 **Depth:** 73m

Fix: 904 **E:** 359479 **N:** 6076882 **Depth:** 74m

Station: TCC_108
Sediment Description:
Fix902: Sand

Fix904: Sand

Fauna Description:
Fix902: Annelida (Polychaeta) - Polychaete tubes

Fix904: Annelida (Polychaeta) - Polychaete tubes, Echinodermata –Ophiuroidea, Other - Cnidaria - *Pennatula phosphorea*

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 909 **E:** 360495 **N:** 6077027 **Depth:** 70m

Fix: 911 **E:** 360463 **N:** 6077033 **Depth:** 70m

Station: TCC_109
Sediment Description:
Fix909: Sand

Fix911: Sand

Fauna Description:
Fix909: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - *Ebalia* sp.

Fix911: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Paguridae, Other - Cnidaria - *Pennatula phosphorea*

Fix: 76 **E:** 360472 **N:** 6077025 **Depth:** 70m

Fix: 76 **E:** 360472 **N:** 6077025 **Retention:** MF

Station: TCC_109
Sediment Description:
Grab: Sand

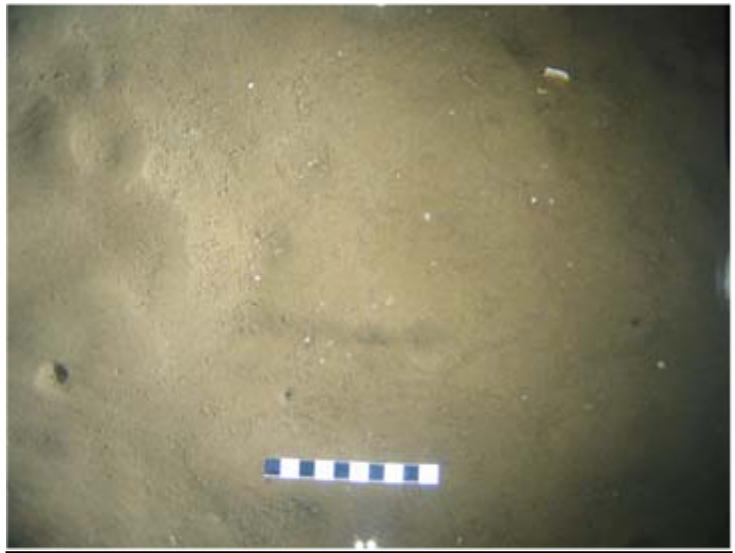
Sieve: Some shell fragments

Fauna Description:
Grab: No visible fauna

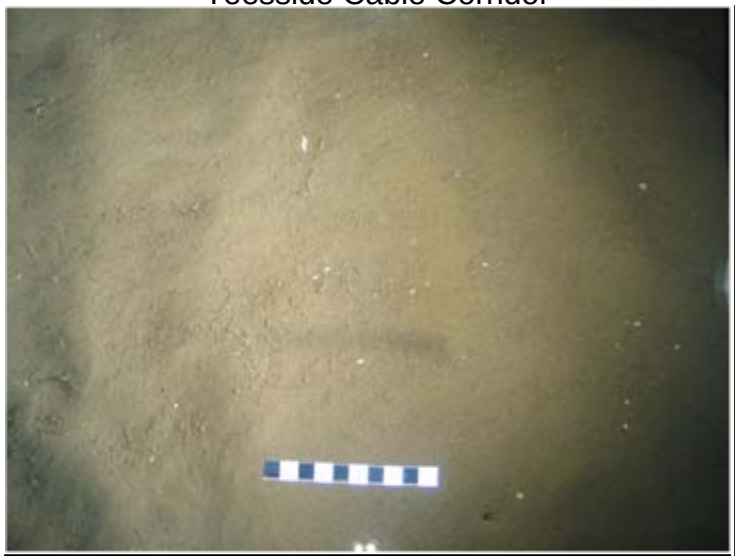
Sieve: Annelida (Polychaeta), Echinodermata - Ophiuroidea

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 888 **E:** 369867 **N:** 6079793 **Depth:** 56m



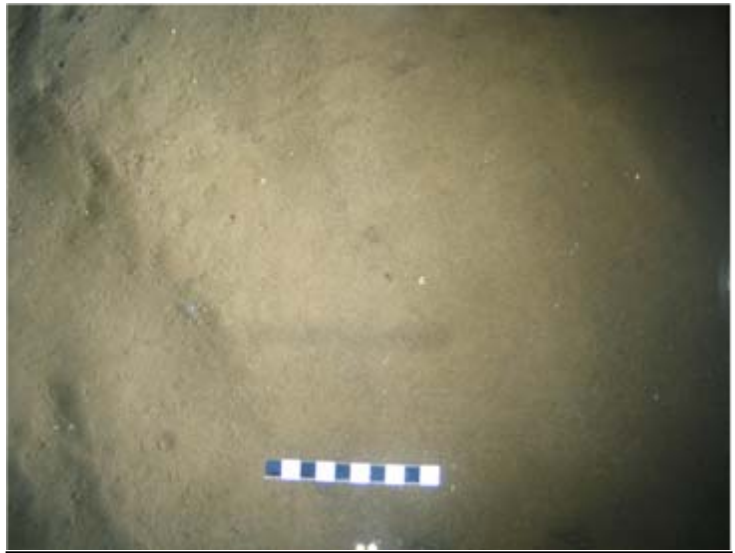
Fix: 890 **E:** 369935 **N:** 6079787 **Depth:** 56m

Station: TCC_110
Sediment Description:
Fix888: Fine sand with some shell fragments

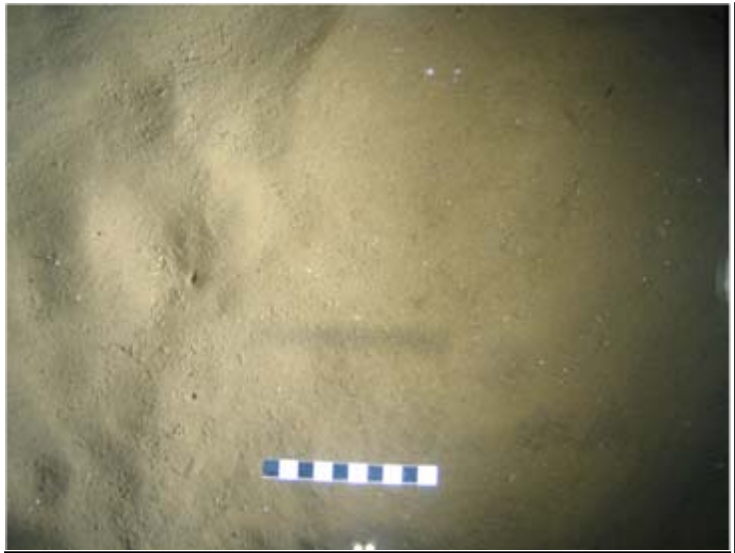
Fix890: Fine sand with some shell fragments

Fauna Description:
Fix888: Annelida (Polychaeta) - Polychaete tubes

Fix890: Annelida (Polychaeta) - Polychaete tubes



Fix: 894 **E:** 369903 **N:** 6079814 **Depth:** 56m



Fix: 895 **E:** 369910 **N:** 6079778 **Depth:** 56m

Station: TCC_110
Sediment Description:
Fix894: Fine sand with some shell fragments

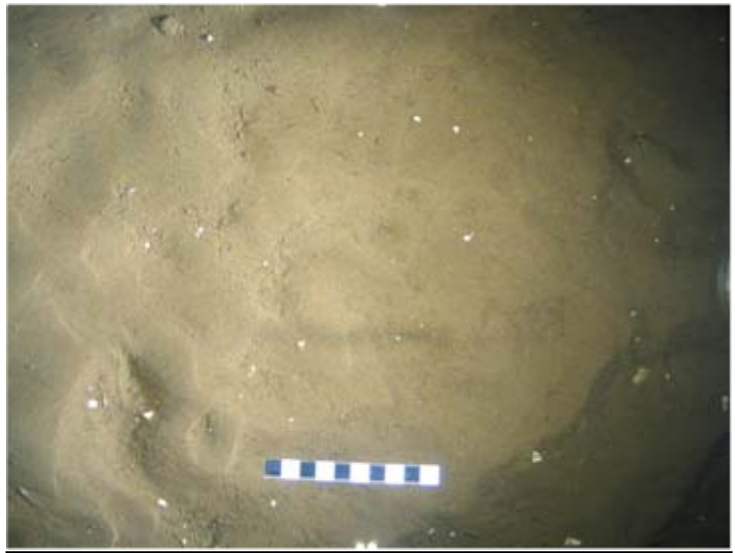
Fix895: Fine sand with some shell fragments

Fauna Description:
Fix894: Annelida (Polychaeta) - Polychaete tubes

Fix895: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 881 **E:** 370915 **N:** 6079967 **Depth:** 52m

Fix: 883 **E:** 370898 **N:** 6079995 **Depth:** 52m

Station: TCC_111
Sediment Description:
Fix881: Fine sand with some shell fragments

Fix883: Fine sand with some shell fragments

Fauna Description:
Fix881: Annelida (Polychaeta) - Polychaete tubes

Fix883: Annelida (Polychaeta) - Polychaete tubes

Fix: 75 **E:** 370960 **N:** 6080002 **Depth:** 52m

Fix: 75 **E:** 370960 **N:** 6080002 **Retention:** MF

Station: TCC_111
Sediment Description:
Grab: Fine sand with some shell fragments

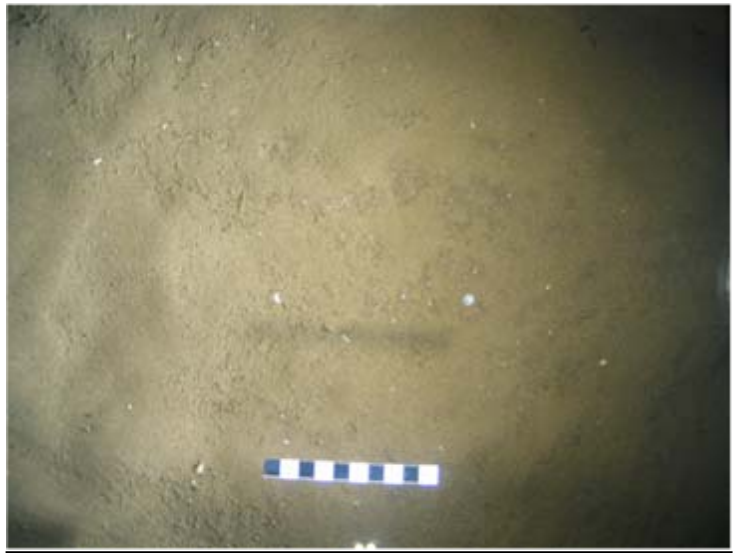
Sieve: Shells and shell fragments

Fauna Description:
Grab: No visible fauna

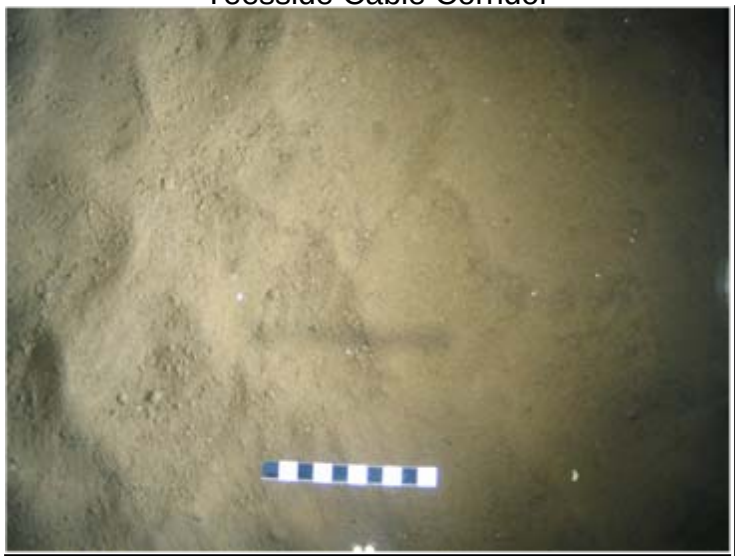
Sieve: No visible fauna

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 872 **E:** 371814 **N:** 6080104 **Depth:** 55m



Fix: 876 **E:** 371845 **N:** 6080089 **Depth:** 55m

Station: TCC_112
Sediment Description:
Fix872: Fine sand with some shell fragments

Fix876: Fine sand with some shell fragments

Fauna Description:
Fix872: Annelida (Polychaeta) - Polychaete tubes

Fix876: Annelida (Polychaeta) - Polychaete tubes

Fix: 74 **E:** 371841 **N:** 6080103 **Depth:** 55m

Fix: 74 **E:** 371841 **N:** 6080103 **Retention:** MF

Station: TCC_112
Sediment Description:
Grab: Fine sand with some shell fragments

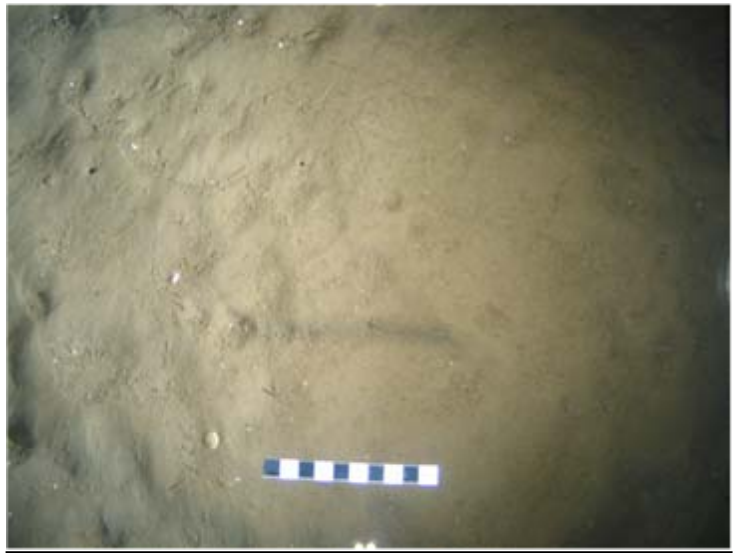
Sieve: Shells and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 861 **E:** 373084 **N:** 6080213 **Depth:** 58m

Fix: 865 **E:** 373061 **N:** 6080205 **Depth:** 58m

Station: TCC_113
Sediment Description:
Fix861: Fine sand with some shell fragments

Fix865: Fine sand with some shell fragments

Fauna Description:
Fix861: Annelida (Polychaeta) - Polychaete tubes

Fix865: Annelida (Polychaeta) - Polychaete tubes

Fix: 73 **E:** 373103 **N:** 6080193 **Depth:** 58m

Fix: 73 **E:** 373103 **N:** 6080193 **Retention:** MF

Station: TCC_113
Sediment Description:
Grab: Fine sand

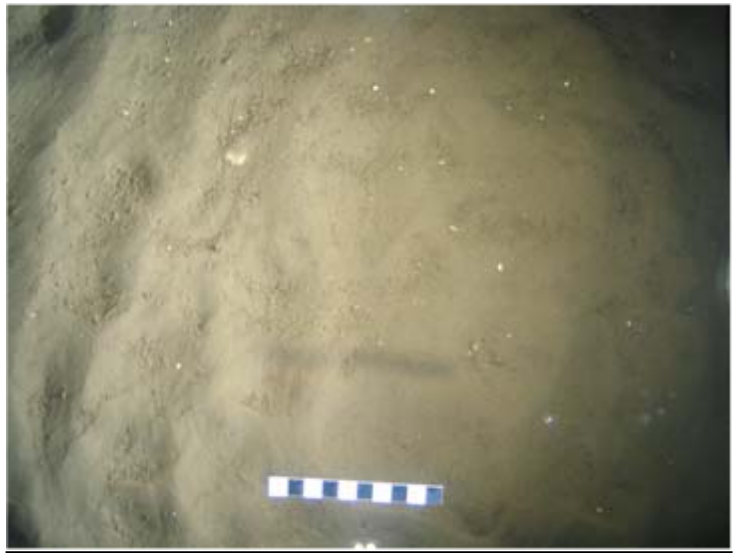
Sieve: Shells, shell fragments and gravel

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta)

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 855 **E:** 380860 **N:** 6081071 **Depth:** 47

Fix: 857 **E:** 380854 **N:** 6081096 **Depth:** 47

Station: TCC_114
Sediment Description:
Fix855: Fine sand with some shell fragments

Fix857: Fine sand with some shell fragments

Fauna Description:
Fix855: Annelida (Polychaeta) - Polychaete tubes

Fix857: Annelida (Polychaeta) - Polychaete tubes, Arthropoda (Crustacea) - Paguridae, Other - Cnidaria - *Hydractinia echinata*

Fix: 72 **E:** 380897 **N:** 6081121 **Depth:** 47

Fix: 72 **E:** 380897 **N:** 6081121 **Retention:** MF

Station: TCC_114
Sediment Description:
Grab: Fine sand with some shell fragments

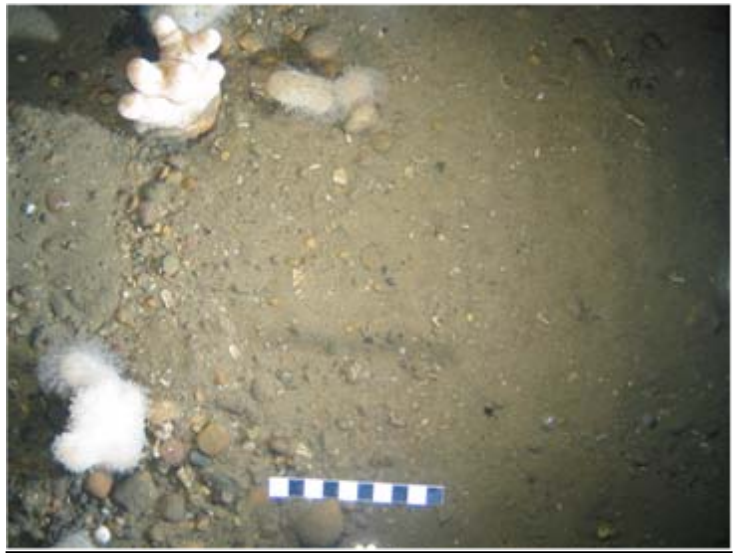
Sieve: Shell fragments

Fauna Description:
Grab: No visible fauna

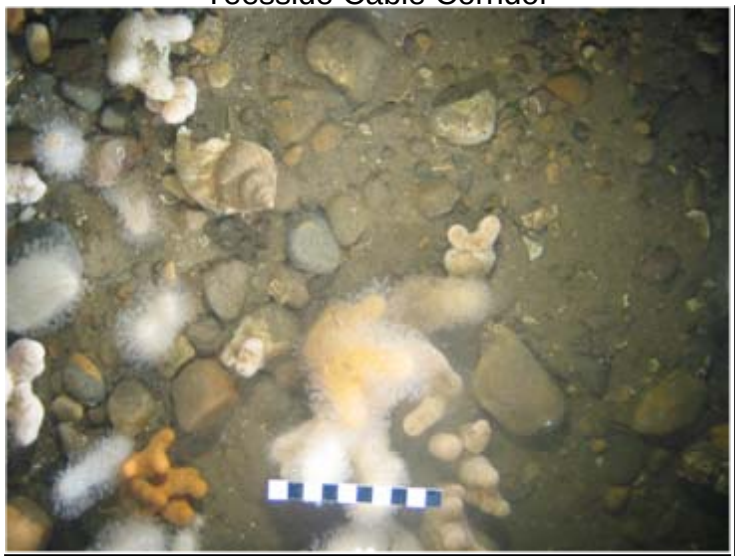
Sieve: Annelida (Polychaeta)

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 844 **E:** 384684 **N:** 6080448 **Depth:** 43



Fix: 848 **E:** 384646 **N:** 6080482 **Depth:** 43

Station: TCC_115
Sediment Description:
Fix844: Gravelly sand with pebbles

Fix848: Gravelly sand with pebbles and cobbles

Fauna Description:
Fix844: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Psammechinus* sp., Other – Cnidaria - *Alcyonium* sp.

Fix848: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - Ophiuroidea, Other - Cnidaria - *Alcyonium* sp.

Fix: 68 **E:** 384705 **N:** 6080481 **Depth:** 44

Fix: 68 **E:** 384705 **N:** 6080481 **Retention:** MF

Station: TCC_115
Sediment Description:
Grab: Gravelly sand with pebbles and shell fragments

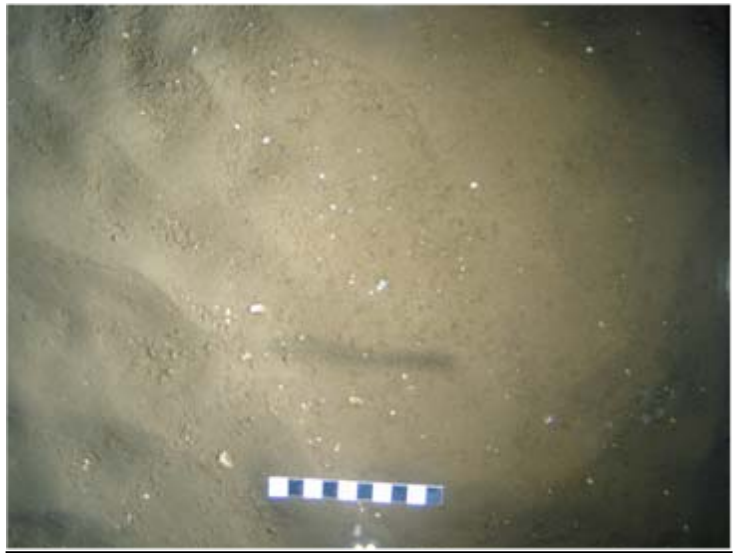
Sieve: Gravel and pebbles with shells and shell fragments

Fauna Description:
Grab: Annelida (Polychaeta) - *Spirobranchus* sp.

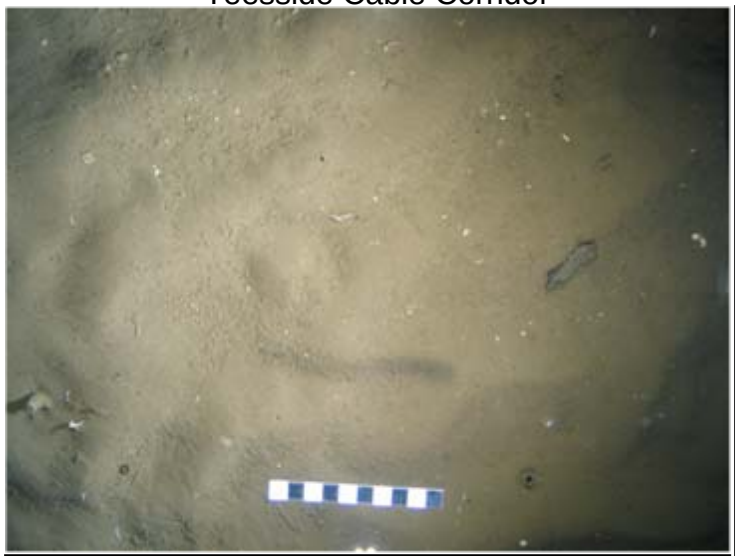
Sieve: Annelida (Polychaeta) - *Spirobranchus* sp., Echinodermata - *Echinocardium* sp., Other - Cnidaria - *Alcyonium* sp.

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 835 **E:** 385880 **N:** 6080653 **Depth:** 43m



Fix: 838 **E:** 385892 **N:** 6080642 **Depth:** 43m

Station: TCC_116
Sediment Description:
Fix835: Fine sand with some shell fragments

Fix838: Fine sand with some shell fragments

Fauna Description:
Fix835: Annelida (Polychaeta) - Polychaete tubes

Fix838: Annelida (Polychaeta) - Polychaete tubes

Fix: 69 **E:** 385860 **N:** 6080672 **Depth:** 43m

Fix: 69 **E:** 385860 **N:** 6080672 **Retention:** MF

Station: TCC_116
Sediment Description:
Grab: Fine sand with some shell fragments

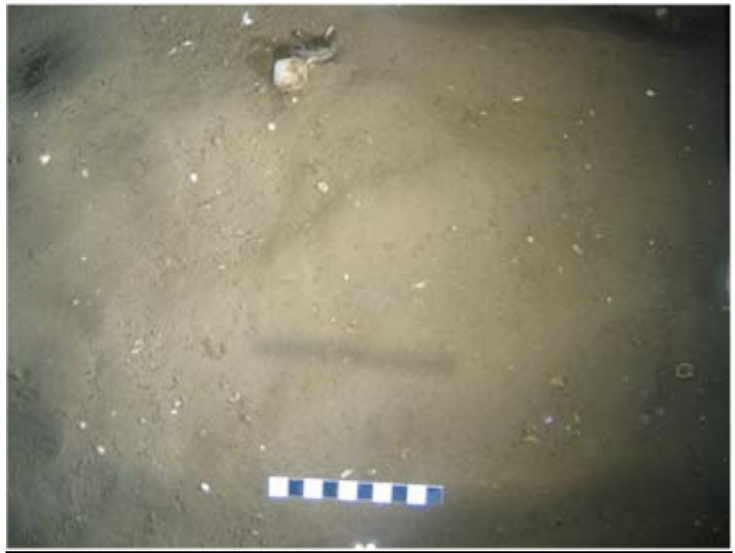
Sieve: Shell fragments

Fauna Description:
Grab: Annelida (Polychaeta)

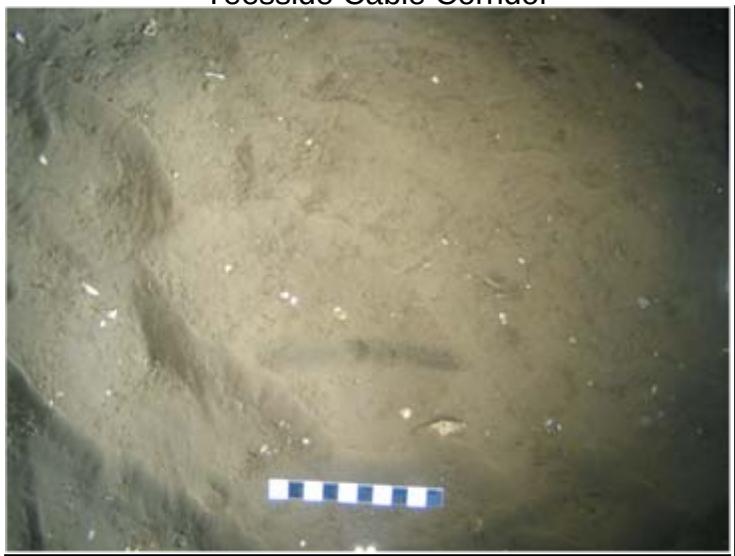
Sieve: Annelida (Polychaeta)

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 820 **E:** 386781 **N:** 6080868 **Depth:** 38m



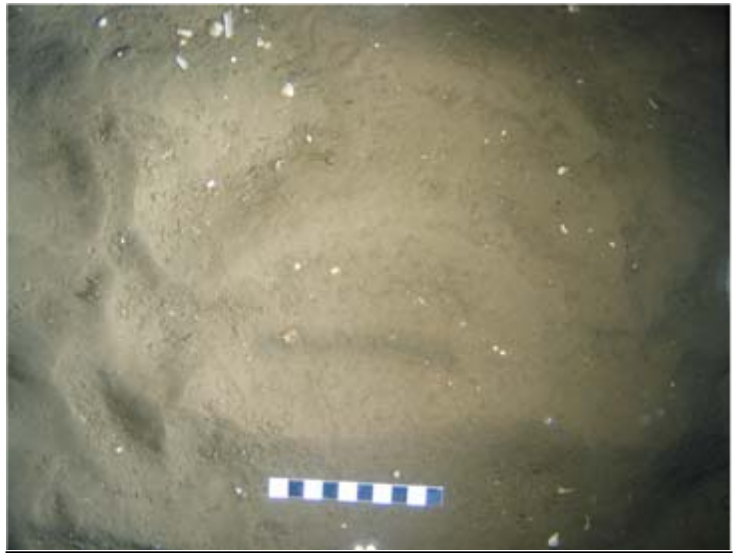
Fix: 822 **E:** 386791 **N:** 6080866 **Depth:** 38m

Station: TCC_117
Sediment Description:
Fix820: Fine sand with some shell fragments

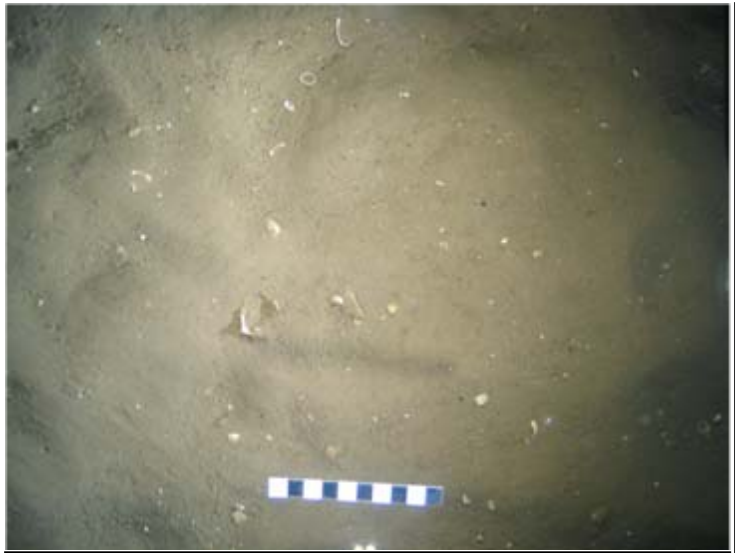
Fix822: Fine sand with some shell fragments

Fauna Description:
Fix820: Annelida (Polychaeta) - Polychaete tubes

Fix822: Annelida (Polychaeta) - Polychaete tubes



Fix: 824 **E:** 386789 **N:** 6080864 **Depth:** 38m



Fix: 826 **E:** 386791 **N:** 6080859 **Depth:** 38m

Station: TCC_117
Sediment Description:
Fix824: Fine sand with some shell fragments

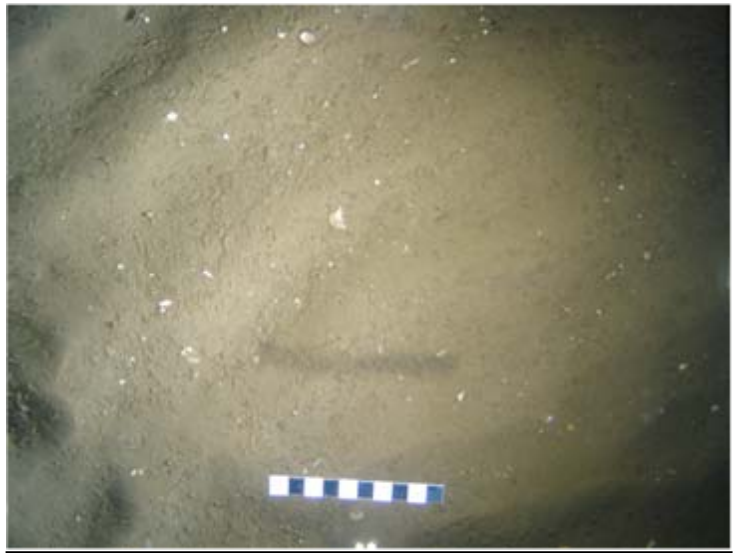
Fix826: Fine sand with some shell fragments

Fauna Description:
Fix824: Annelida (Polychaeta) - Polychaete tubes

Fix826: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 815 **E:** 388018 **N:** 6081073 **Depth:** 37

Fix: 817 **E:** 388005 **N:** 6081053 **Depth:** 37

Station: TCC_118
Sediment Description:
Fix815: Fine sand with some shell fragments

Fix817: Fine sand with some shell fragments

Fauna Description:
Fix815: Annelida (Polychaeta) - Polychaete tubes

Fix817: Annelida (Polychaeta) - Polychaete tubes

Fix: 70 **E:** 388020 **N:** 6081038 **Depth:** 37

Fix: 70 **E:** 388020 **N:** 6081038 **Retention:** MF

Station: TCC_118
Sediment Description:
Grab: Fine sand with some shell fragments

Sieve: Shells and shell fragments

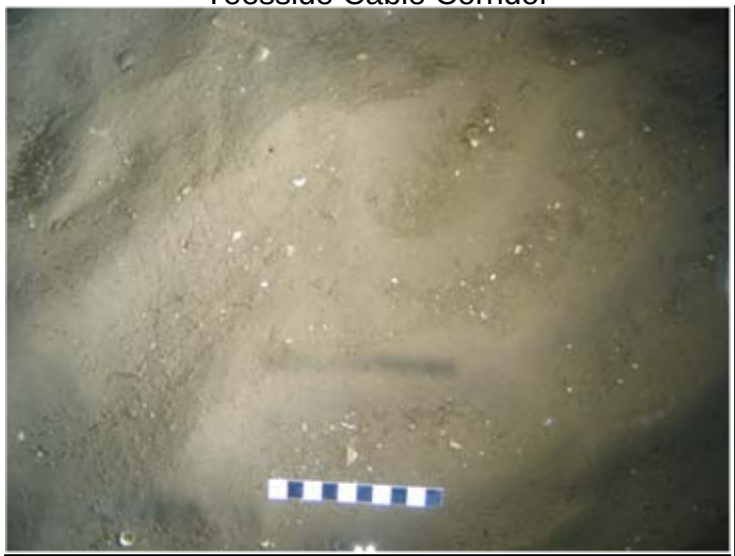
Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta) - Aphroditidae

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor

Fix: 803 **E:** 389867 **N:** 6081256 **Depth:** 33m



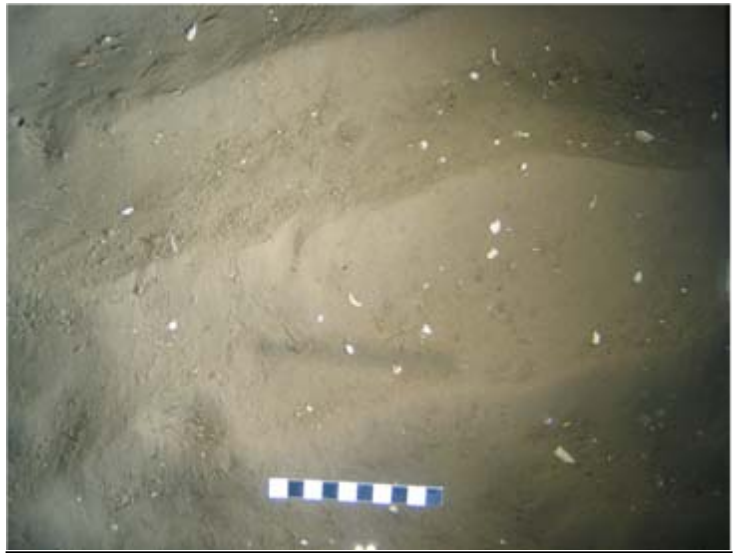
Fix: 805 **E:** 389876 **N:** 6081245 **Depth:** 33m

Station: TCC_119
Sediment Description:
Fix803: Fine sand with some shell fragments

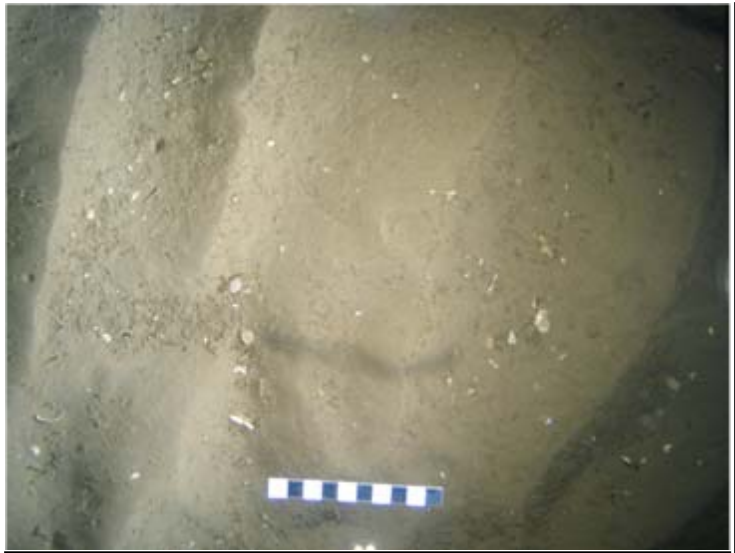
Fix805: Fine sand with some shell fragments

Fauna Description:
Fix803: Annelida (Polychaeta) - Polychaete tubes

Fix805: Annelida (Polychaeta) - Polychaete tubes



Fix: 809 **E:** 389883 **N:** 6081243 **Depth:** 33m



Fix: 811 **E:** 389869 **N:** 6081239 **Depth:** 33m

Station: TCC_119
Sediment Description:
Fix809: Fine sand with some shell fragments

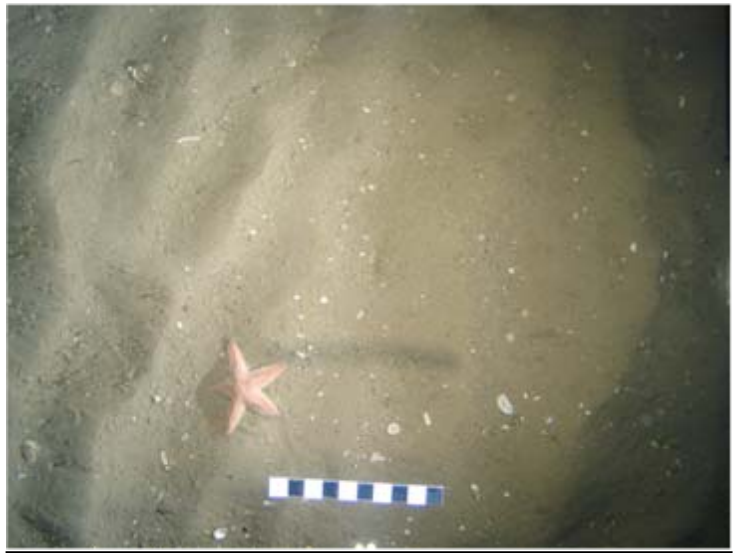
Fix811: Fine sand with some shell fragments

Fauna Description:
Fix809: Annelida (Polychaeta) - Polychaete tubes

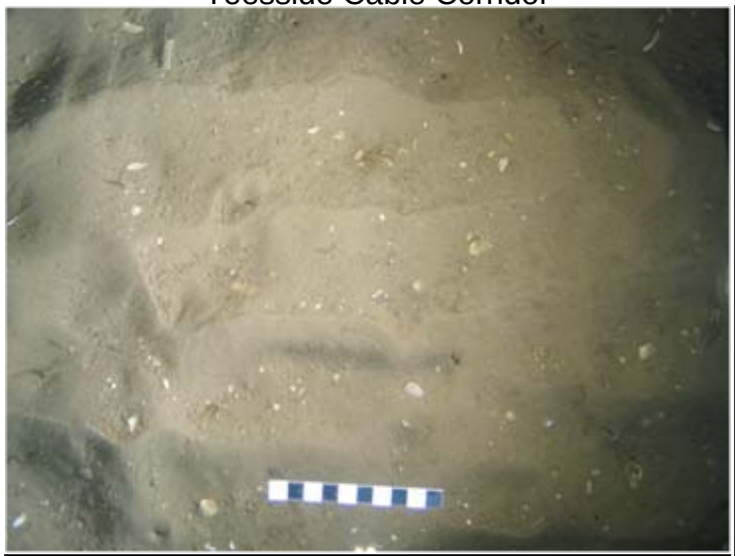
Fix811: Annelida (Polychaeta) - Polychaete tubes

APPENDIX B - SAMPLING AND SEABED IMAGERY

Teesside Cable Corridor



Fix: 794 **E:** 391490 **N:** 6081376 **Depth:** 30



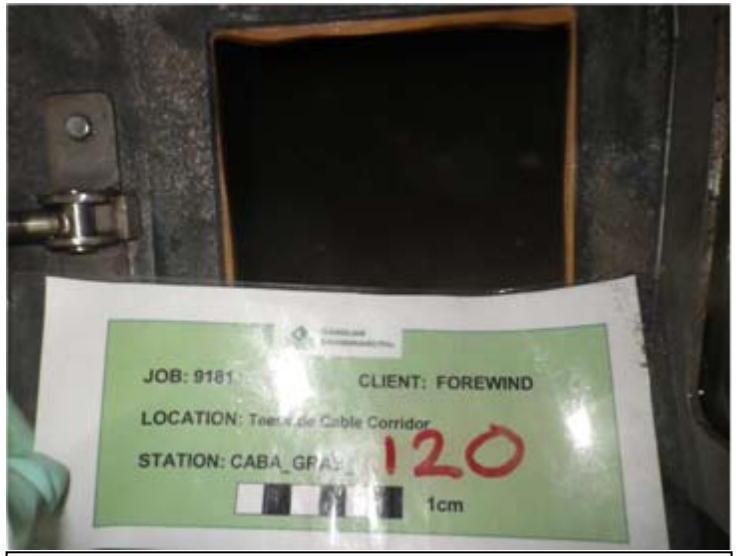
Fix: 802 **E:** 391467 **N:** 6081390 **Depth:** 30

Station: TCC_120
Sediment Description:
Fix794: Fine sand with some shell fragments

Fix802: Fine sand with some shell fragments

Fauna Description:
Fix794: Annelida (Polychaeta) - Polychaete tubes, Echinodermata - *Astropecten irregularis*

Fix802: Annelida (Polychaeta) - Polychaete tubes



Fix: 71 **E:** 391434 **N:** 6081345 **Depth:** 30

Fix: 71 **E:** 391434 **N:** 6081345 **Retention:** MF

Station: TCC_120
Sediment Description:
Grab: Fine sand with shells

Sieve: Shells and shell fragments

Fauna Description:
Grab: No visible fauna

Sieve: Annelida (Polychaeta)

APPENDIX C – PARTICLE SIZE ANALYSIS

APPENDIX C - PARTICLE SIZE ANALYSIS
Tranche B

Table C.1 Tranche B Sediment Characteristics

Station	Mean Diameter (µm)	Mean Diameter (phi)	Fines %	Sand %	Gravel %	Wentworth Classification (based on mean grain size)	Sorting[1]	Modified Folk Classification	Total Organic Carbon[2] (%)
TB_01	169.2	2.6	1.5	96.4	2	Fine Sand	Well	(g)S	<0.4
TB_02	169.9	2.6	1.7	92.6	5.7	Fine Sand	Moderate	gS	
TB_03	185.7	2.4	1.3	95.5	3.2	Fine Sand	Moderately Well	(g)S	
TB_04	175.6	2.5	1.4	95.4	3.2	Fine Sand	Well	(g)S	<0.4
TB_05	363.1	1.5	1.4	82.6	16.1	Medium Sand	Poor	gS	
TB_06	525.4	0.9	1.1	75.5	23.4	Coarse Sand	Very Poor	gS	<0.4
TB_07	172.9	2.5	1.1	95.4	3.4	Fine Sand	Moderately Well	(g)S	
TB_08	176	2.5	1	98.3	0.7	Fine Sand	Well	(g)S	
TB_09	161.3	2.6	1.3	96.2	2.5	Fine sand	Well	(g)S	
TB_10	179.5	2.5	1.3	97.3	1.5	Fine Sand	Well	(g)S	<0.4
TB_11	173.1	2.5	1.4	98.2	0.4	Fine Sand	Well	(g)S	
TB_12	377	1.4	1	82.9	16.1	Medium Sand	Very Poor	gS	
TB_13	176.3	2.5	1.3	95.5	3.2	Fine Sand	Moderately Well	(g)S	<0.4
TB_14	177.1	2.5	1.3	98.4	0.3	Fine Sand	Well	(g)S	
TB_15	177.2	2.5	0.9	95.1	4	Fine Sand	Moderately Well	(g)S	
TB_16	185.1	2.4	1.4	94.2	4.3	Fine Sand	Moderate	(g)S	
TB_17	405.6	1.3	1.3	81.9	16.8	Medium Sand	Very Poor	gS	<0.4
TB_18	174	2.5	1.1	96.2	2.7	Fine Sand	Moderately Well	(g)S	
TB_19	286.2	1.8	1.2	85	13.8	Medium Sand	Poor	gS	<0.4
TB_20	447.3	1.2	0.9	80.2	18.8	Medium Sand	Very Poor	gS	
TB_21	175.5	2.5	1.1	98.8	0.1	Fine Sand	Well	(g)S	
TB_22	174.5	2.5	1.2	98.6	0.3	Fine Sand	Well	(g)S	
TB_23	175.1	2.5	1.2	98.2	0.5	Fine Sand	Well	(g)S	
TB_24	196.6	2.3	1.9	90.4	7.7	Fine Sand	Poor	gS	
TB_25	176.2	2.5	1.3	95.2	3.6	Fine Sand	Moderately Well	(g)S	<0.4
TB_26	177	2.5	1.8	97.4	0.8	Fine Sand	Well	(g)S	
TB_27	188.2	2.4	1.2	98.7	0.2	Fine Sand	Well	(g)S	
TB_28	176.6	2.5	1.3	96.2	2.5	Fine Sand	Moderately Well	(g)S	
TB_29	178.9	2.5	0.9	95.2	3.9	Fine Sand	Moderately Well	(g)S	
TB_30	3373.2	-1.8	1.1	26.7	72.1	Very Fine Gravel	Very Poor	sG	
TB_32	180.2	2.5	1.1	98.6	0.3	Fine Sand	Well	(g)S	
TB_33	174.2	2.5	1.3	98.5	0.2	Fine Sand	Well	(g)S	<0.4
TB_34	172.5	2.5	1.6	97.8	0.6	Fine Sand	Well	(g)S	
TB_35	172.9	2.5	1.4	97	1.6	Fine Sand	Well	(g)S	
TB_36	205.1	2.3	1.5	89.2	9.3	Fine Sand	Poor	gS	<0.4
TB_37	198.7	2.3	3.7	86.1	10.1	Fine Sand	Poor	gS	
TB_38	175	2.5	1.6	96.7	1.7	Fine Sand	Well	(g)S	
TB_39	177.4	2.5	1.2	98.7	0.1	Fine Sand	Well	(g)S	
TB_40	178.5	2.5	1.3	98.2	0.4	Fine Sand	Well	(g)S	<0.4
TB_41	176.8	2.5	1	98.8	0.2	Fine Sand	Well	(g)S	
TB_42	174.9	2.5	1.6	97.1	1.3	Fine Sand	Well	(g)S	
TB_43	168.1	2.6	1.4	97.8	0.8	Fine Sand	Well	(g)S	
TB_44	177	2.5	1.3	98.4	0.3	Fine Sand	Well	(g)S	
TB_45	173.2	2.5	1.1	98	0.9	Fine Sand	Well	(g)S	
TB_46	176.5	2.5	1.2	97.9	0.9	Fine Sand	Well	(g)S	
TB_48	9100.6	-3.2	0.3	6.4	93.3	Medium Gravel	Poor	G	
TB_49	1865.6	-0.9	1.7	49.3	49	Very Coarse Sand	Very Poor	sG	
TB_50	9281.8	-3.2	0.3	18.1	81.6	Medium Gravel	Very Poor	G	
TB_51	169.4	2.6	1.5	98.2	0.3	Fine Sand	Well	(g)S	
TB_52	166.3	2.6	1.6	97.5	0.9	Fine Sand	Very Well	(g)S	
TB_53	3510.2	-1.8	7.2	20.4	72.4	Very Fine Gravel	Very Poor	msG	
Min	**161.3**	**-3.2**	**0.3**	**6.4**	**0.1**				**<0.4**
Max	**9281.8**	**2.6**	**7.2**	**98.8**	**93.3**	**Fine Sand to Medium Gravel**	**Very poor to Well**	**(g)S to G**	**<0.4**
Mean	**718.1**	**1.9**	**1.4**	**87.6**	**11**				**NC**
SD	**1855.3**	**1.4**	**0.9**	**22.3**	**22.1**				**NC**

Sediments were not treated to remove carbonates prior to analyses

1 Sorting according to Folk and Ward (1957)

2 Concentrations only available for 11 stations selected for physico-chemistry sampling

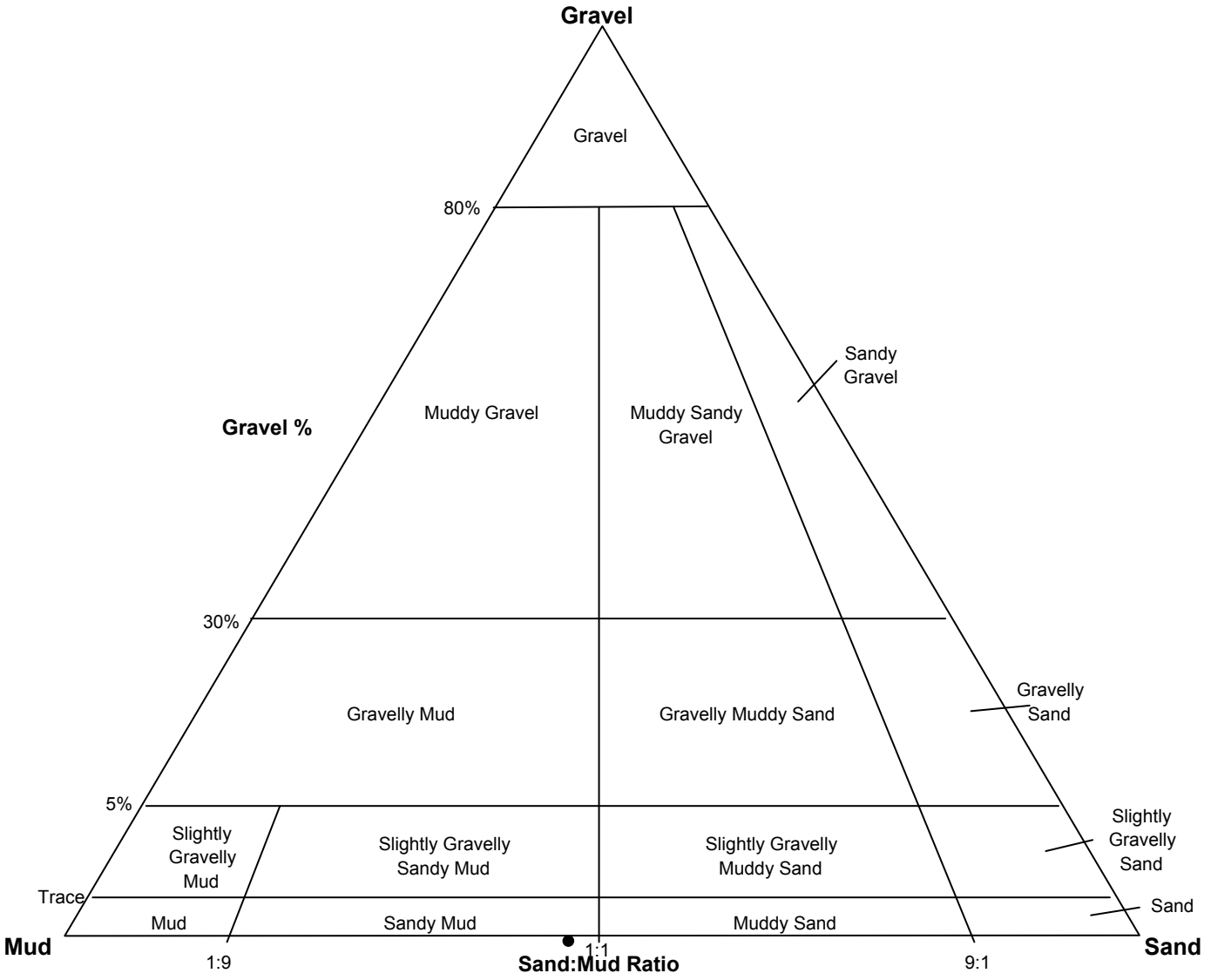
NC Not calculable

(g)S: slightly gravelly sand; gS: gravelly sand; sG: sandy gravel; G: gravel; msG: muddy sandy gravel

APPENDIX C - PARTICLE SIZE ANALYSIS

Tranche B

GRADISTAT MODIFIED FOLK TRIANGLE



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_01**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

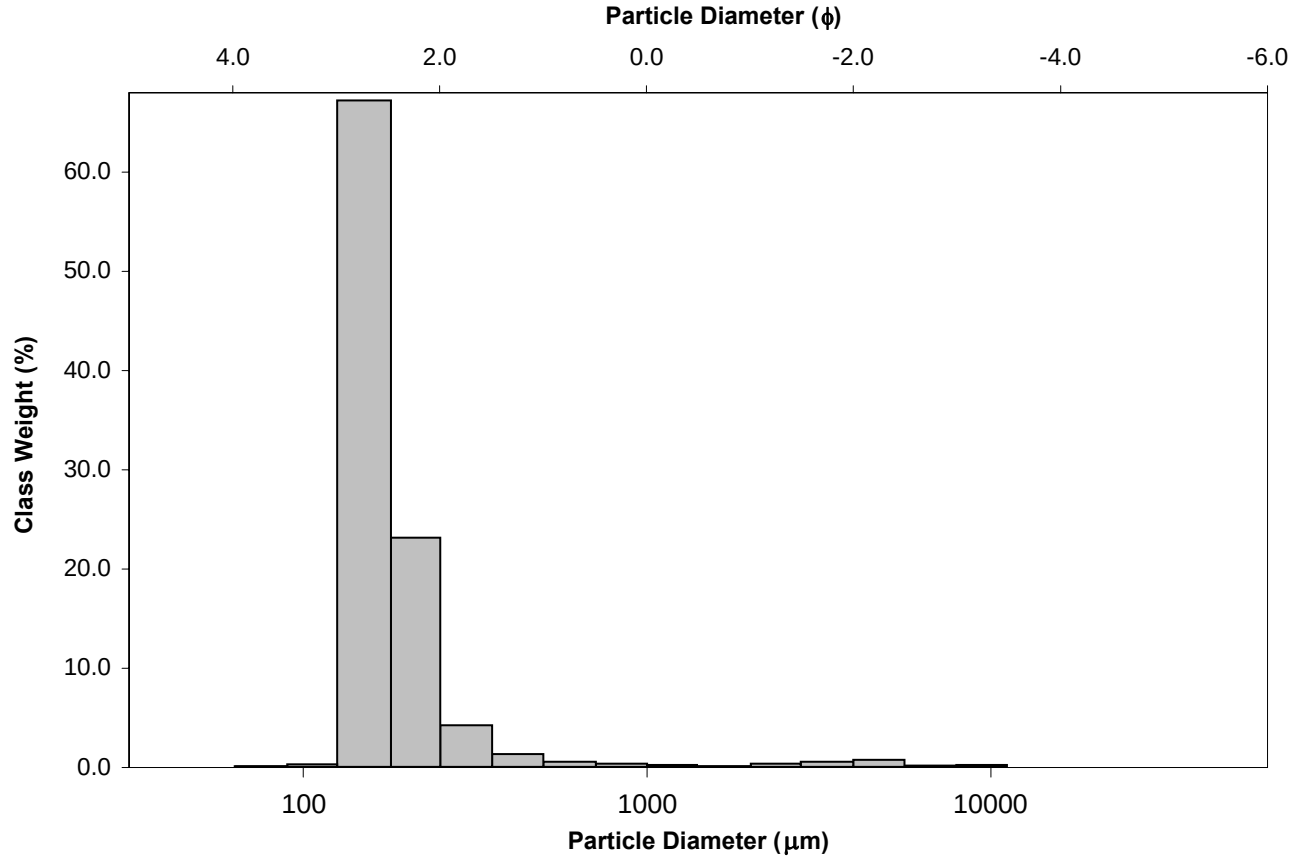
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.5	2.032
MEDIAN or D_{50}:	161.5	2.630
D_{90}:	244.5	2.938
(D_{90} / D_{10}):	1.874	1.446
(D_{90} - D_{10}):	114.0	0.906
(D_{75} / D_{25}):	1.370	1.192
(D_{75} - D_{25}):	52.31	0.454

GRAIN SIZE DISTRIBUTION

GRAVEL:	2.0%	COARSE SAND:	0.9%
SAND:	96.4%	MEDIUM SAND:	5.4%
MUD:	1.5%	FINE SAND:	89.5%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.3%
MEDIUM GRAVEL:	0.3%	MEDIUM SILT:	0.3%
FINE GRAVEL:	0.9%	FINE SILT:	0.3%
V FINE GRAVEL:	0.9%	V FINE SILT:	0.3%
V COARSE SAND:	0.3%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	274.9	175.1	2.514	169.2	2.563	Fine Sand
SORTING (σ):	719.8	1.935	0.952	1.316	0.396	Well Sorted
SKEWNESS (Sk):	8.950	1.021	-1.021	0.394	-0.394	Very Coarse Skewed
KURTOSIS (K):	94.85	20.38	20.38	1.276	1.276	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_02**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Moderately Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Fine Gravelly Fine Sand

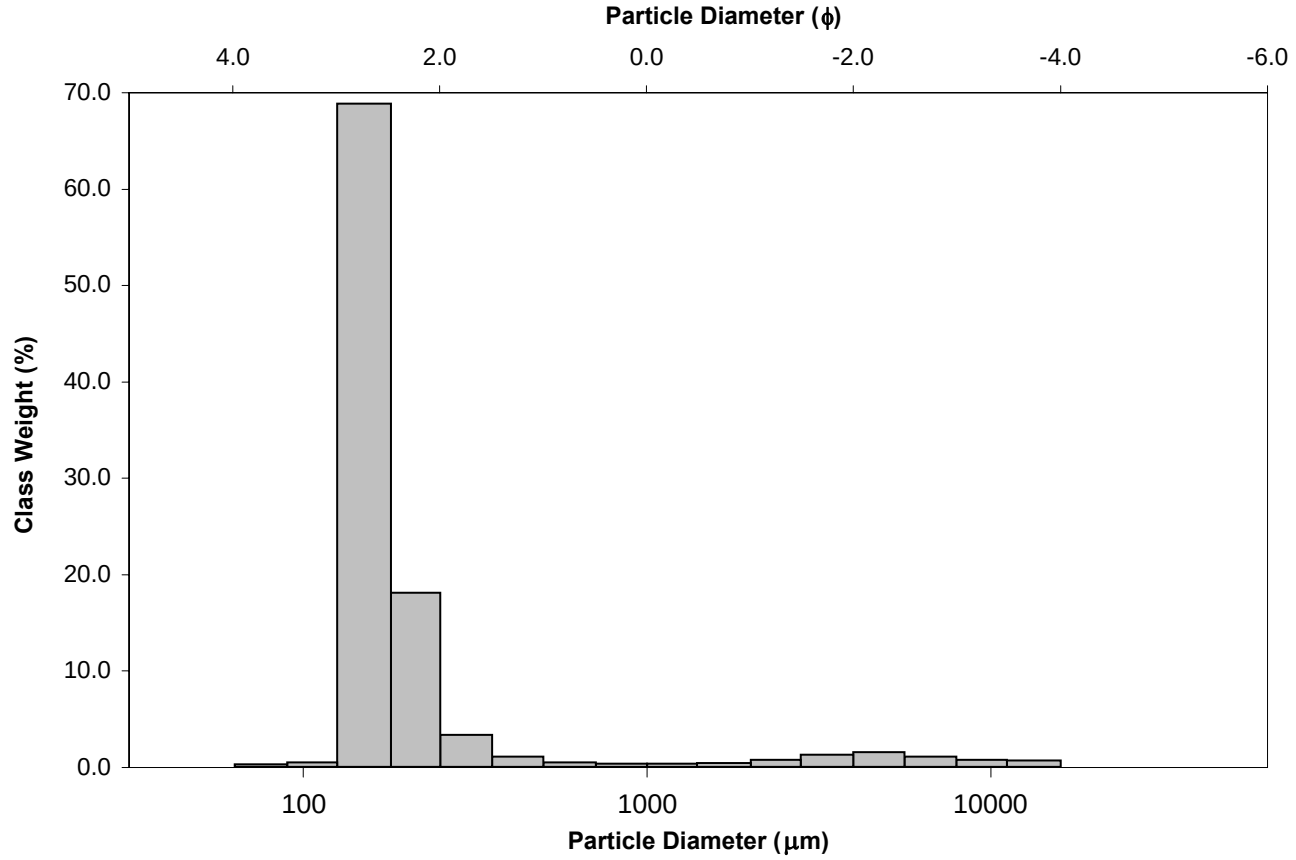
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.0	1.777
MEDIAN or D_{50}:	160.3	2.641
D_{90}:	291.7	2.943
(D_{90} / D_{10}):	2.244	1.656
(D_{90} - D_{10}):	161.7	1.166
(D_{75} / D_{25}):	1.356	1.184
(D_{75} - D_{25}):	50.01	0.439

GRAIN SIZE DISTRIBUTION

GRAVEL:	5.7%	COARSE SAND:	0.8%
SAND:	92.6%	MEDIUM SAND:	4.2%
MUD:	1.7%	FINE SAND:	86.1%
		V FINE SAND:	0.8%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.3%
MEDIUM GRAVEL:	1.3%	MEDIUM SILT:	0.3%
FINE GRAVEL:	2.5%	FINE SILT:	0.3%
V FINE GRAVEL:	1.9%	V FINE SILT:	0.3%
V COARSE SAND:	0.8%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	518.7	195.5	2.355	169.9	2.557	Fine Sand
SORTING (σ):	1588.3	2.603	1.380	1.825	0.868	Moderately Sorted
SKEWNESS (Sk):	5.685	1.890	-1.890	0.588	-0.588	Very Coarse Skewed
KURTOSIS (K):	38.97	11.51	11.51	4.169	4.169	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_03**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

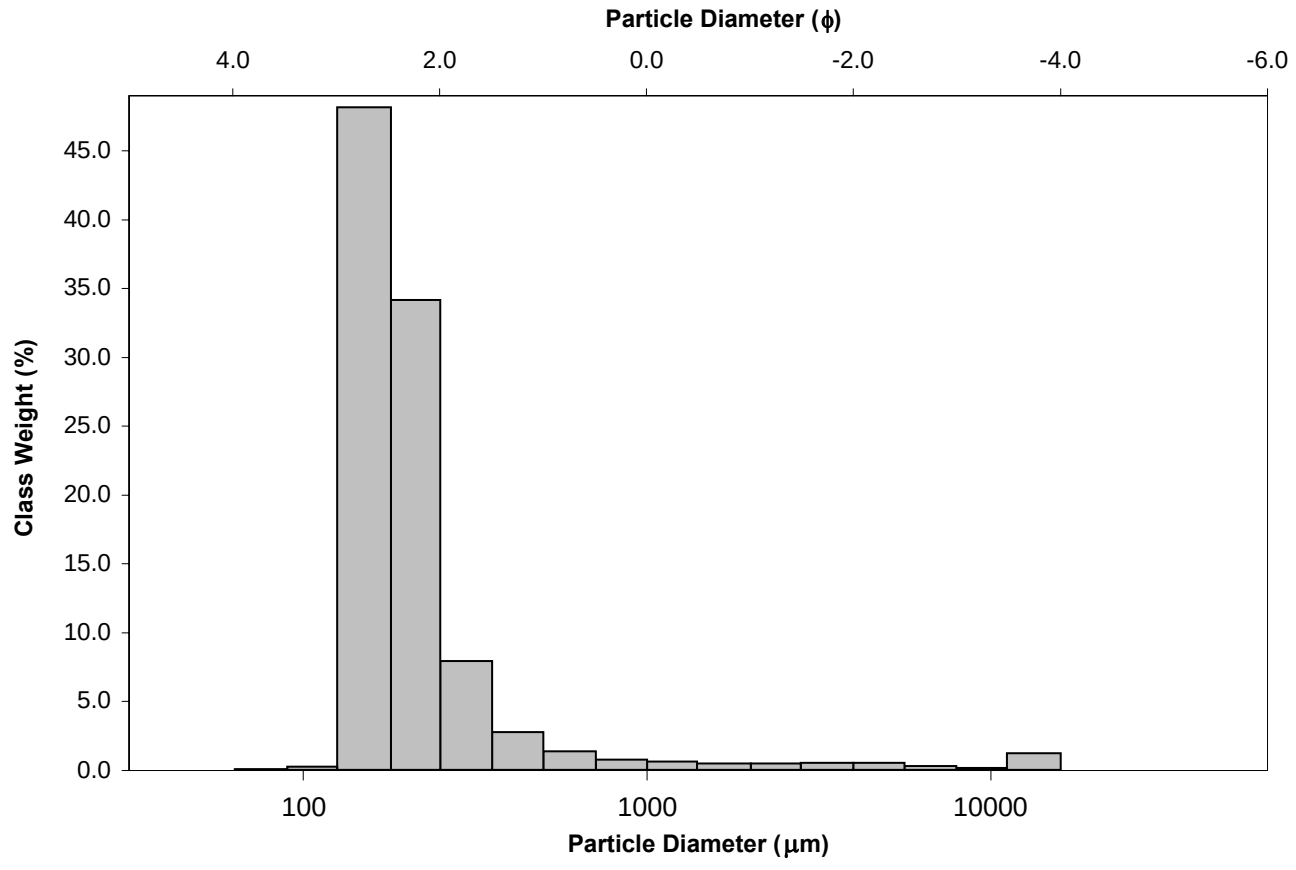
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	132.9	1.562
MEDIAN or D_{50}:	178.1	2.489
D_{90}:	338.7	2.912
(D_{90} / D_{10}):	2.549	1.864
(D_{90} - D_{10}):	205.8	1.350
(D_{75} / D_{25}):	1.549	1.297
(D_{75} - D_{25}):	81.35	0.631

GRAIN SIZE DISTRIBUTION

GRAVEL:	3.2%	COARSE SAND:	2.1%
SAND:	95.5%	MEDIUM SAND:	10.5%
MUD:	1.3%	FINE SAND:	81.6%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	1.4%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.8%	FINE SILT:	0.2%
V FINE GRAVEL:	0.9%	V FINE SILT:	0.2%
V COARSE SAND:	1.0%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	468.0	207.7	2.268	185.7	2.429	Fine Sand
SORTING (σ):	1629.7	2.279	1.188	1.511	0.595	Moderately Well Sorted
SKEWNESS (Sk):	7.126	1.958	-1.958	0.406	-0.406	Very Coarse Skewed
KURTOSIS (K):	55.19	15.68	15.68	1.588	1.588	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_04**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

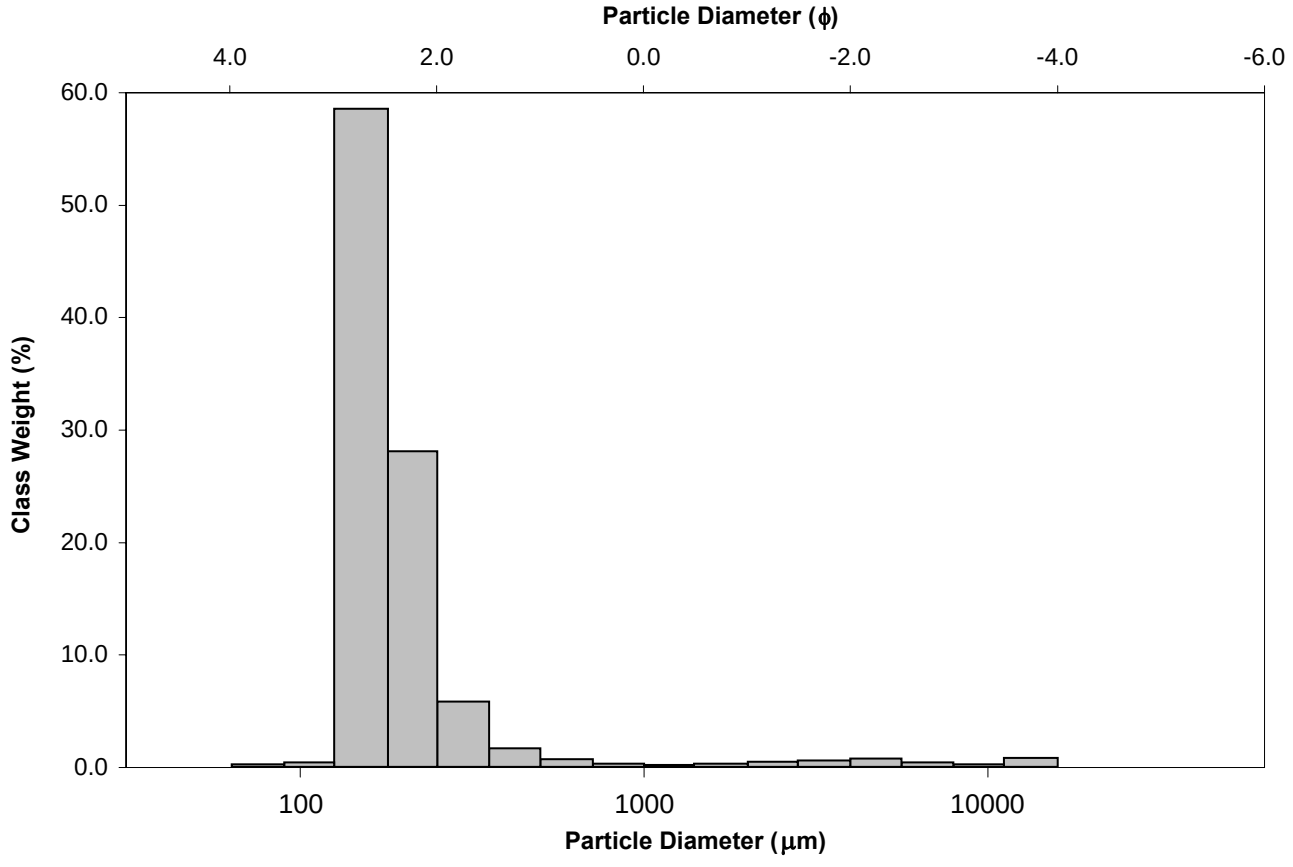
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.2	1.823
MEDIAN or D_{50}:	167.3	2.579
D_{90}:	282.6	2.930
(D_{90} / D_{10}):	2.154	1.607
(D_{90} - D_{10}):	151.4	1.107
(D_{75} / D_{25}):	1.476	1.251
(D_{75} - D_{25}):	68.40	0.562

GRAIN SIZE DISTRIBUTION

GRAVEL:	3.2%	COARSE SAND:	0.9%
SAND:	95.4%	MEDIUM SAND:	7.4%
MUD:	1.4%	FINE SAND:	85.9%
		V FINE SAND:	0.7%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	1.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	1.2%	FINE SILT:	0.2%
V FINE GRAVEL:	1.0%	V FINE SILT:	0.2%
V COARSE SAND:	0.5%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	410.8	191.6	2.384	175.6	2.510	Fine Sand
SORTING (σ):	1416.6	2.200	1.138	1.399	0.484	Well Sorted
SKEWNESS (Sk):	7.627	2.038	-2.038	0.418	-0.418	Very Coarse Skewed
KURTOSIS (K):	65.45	17.27	17.27	1.363	1.363	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_05**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Fine Gravelly Fine Sand

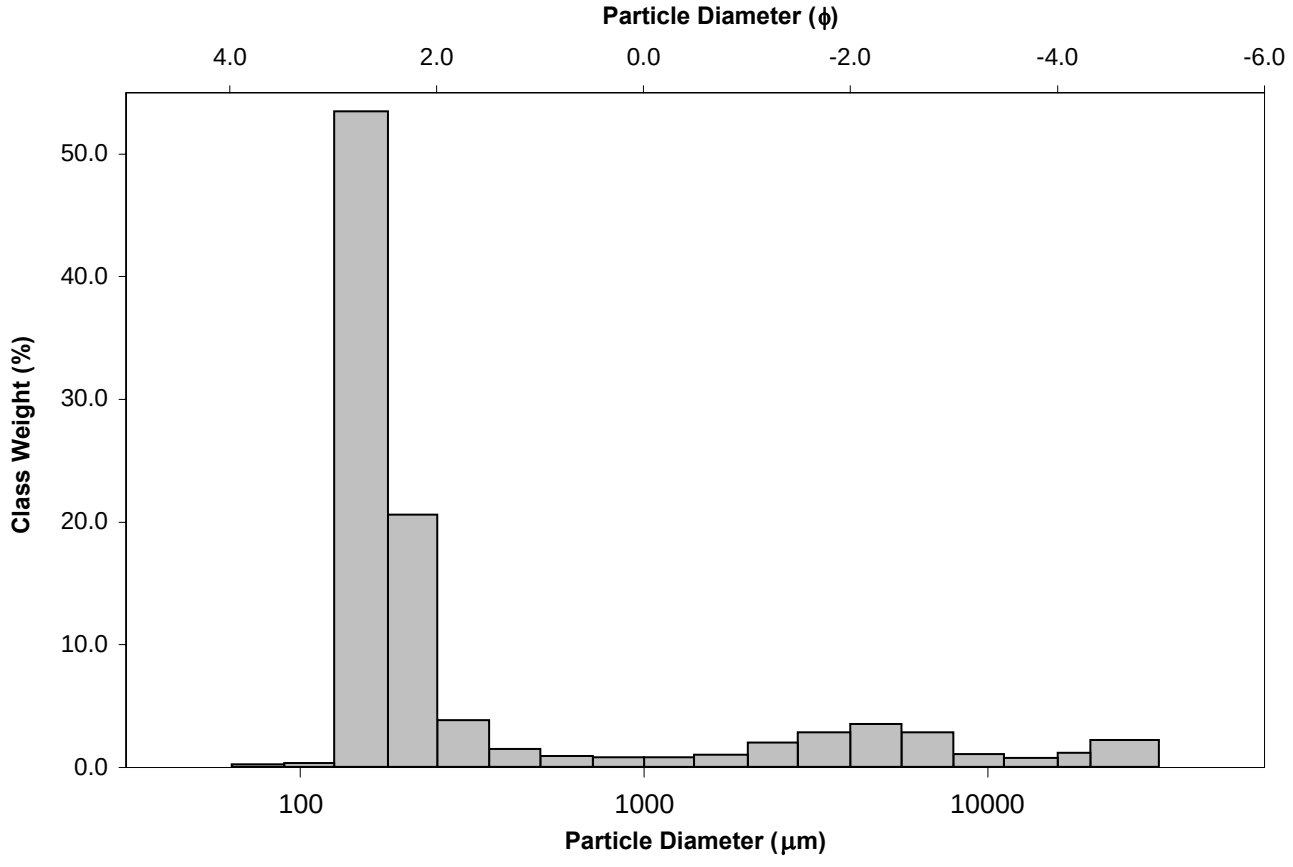
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.9	-2.203
MEDIAN or D_{50}:	172.3	2.537
D_{90}:	4604.5	2.922
(D_{90} / D_{10}):	34.90	-1.326
(D_{90} - D_{10}):	4472.6	5.125
(D_{75} / D_{25}):	1.700	1.380
(D_{75} - D_{25}):	102.0	0.765

GRAIN SIZE DISTRIBUTION

GRAVEL:	16.1%	COARSE SAND:	1.6%
SAND:	82.6%	MEDIUM SAND:	5.1%
MUD:	1.4%	FINE SAND:	73.6%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	3.5%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	1.7%	MEDIUM SILT:	0.2%
FINE GRAVEL:	6.1%	FINE SILT:	0.2%
V FINE GRAVEL:	4.7%	V FINE SILT:	0.2%
V COARSE SAND:	1.7%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	1719.8	313.8	1.672	363.1	1.462	Medium Sand
SORTING (σ):	4784.5	4.398	2.137	3.719	1.895	Poorly Sorted
SKEWNESS (Sk):	4.023	1.464	-1.464	0.845	-0.845	Very Coarse Skewed
KURTOSIS (K):	19.27	4.865	4.865	3.268	3.268	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_06**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Very Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Medium Gravelly Fine Sand

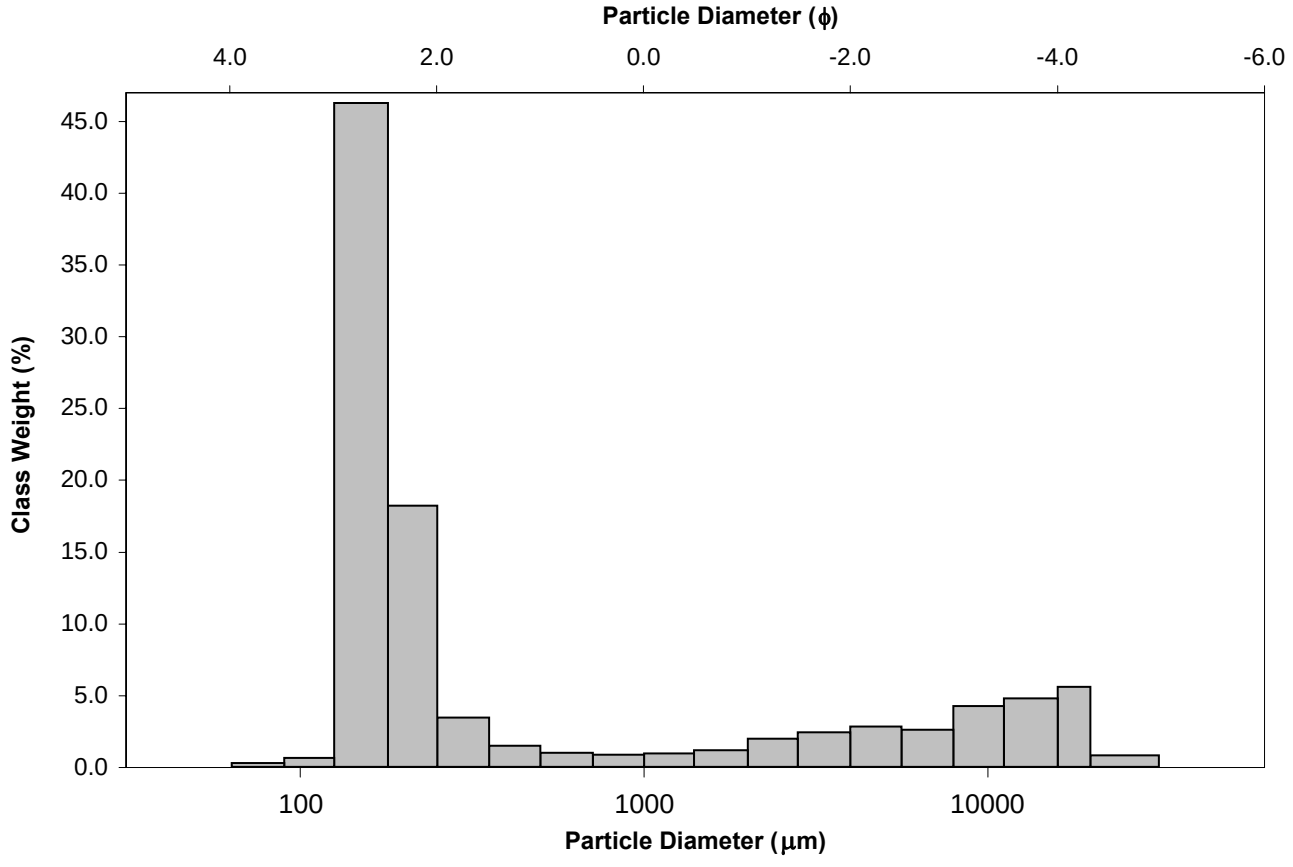
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	132.8	-3.427
MEDIAN or D_{50}:	179.4	2.479
D_{90}:	10755.4	2.913
(D_{90} / D_{10}):	81.02	-0.850
(D_{90} - D_{10}):	10622.6	6.340
(D_{75} / D_{25}):	8.380	-8.688
(D_{75} - D_{25}):	1096.8	3.067

GRAIN SIZE DISTRIBUTION

GRAVEL:	23.4%	COARSE SAND:	1.8%
SAND:	75.5%	MEDIUM SAND:	4.9%
MUD:	1.1%	FINE SAND:	65.7%
		V FINE SAND:	0.9%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	4.6%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	9.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	5.4%	FINE SILT:	0.2%
V FINE GRAVEL:	4.4%	V FINE SILT:	0.2%
V COARSE SAND:	2.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	2590.3	441.7	1.179	525.4	0.928	Coarse Sand
SORTING (σ):	5193.8	5.684	2.507	5.268	2.397	Very Poorly Sorted
SKEWNESS (Sk):	2.367	1.038	-1.038	0.861	-0.861	Very Coarse Skewed
KURTOSIS (K):	8.057	2.885	2.885	0.926	0.926	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_07** ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

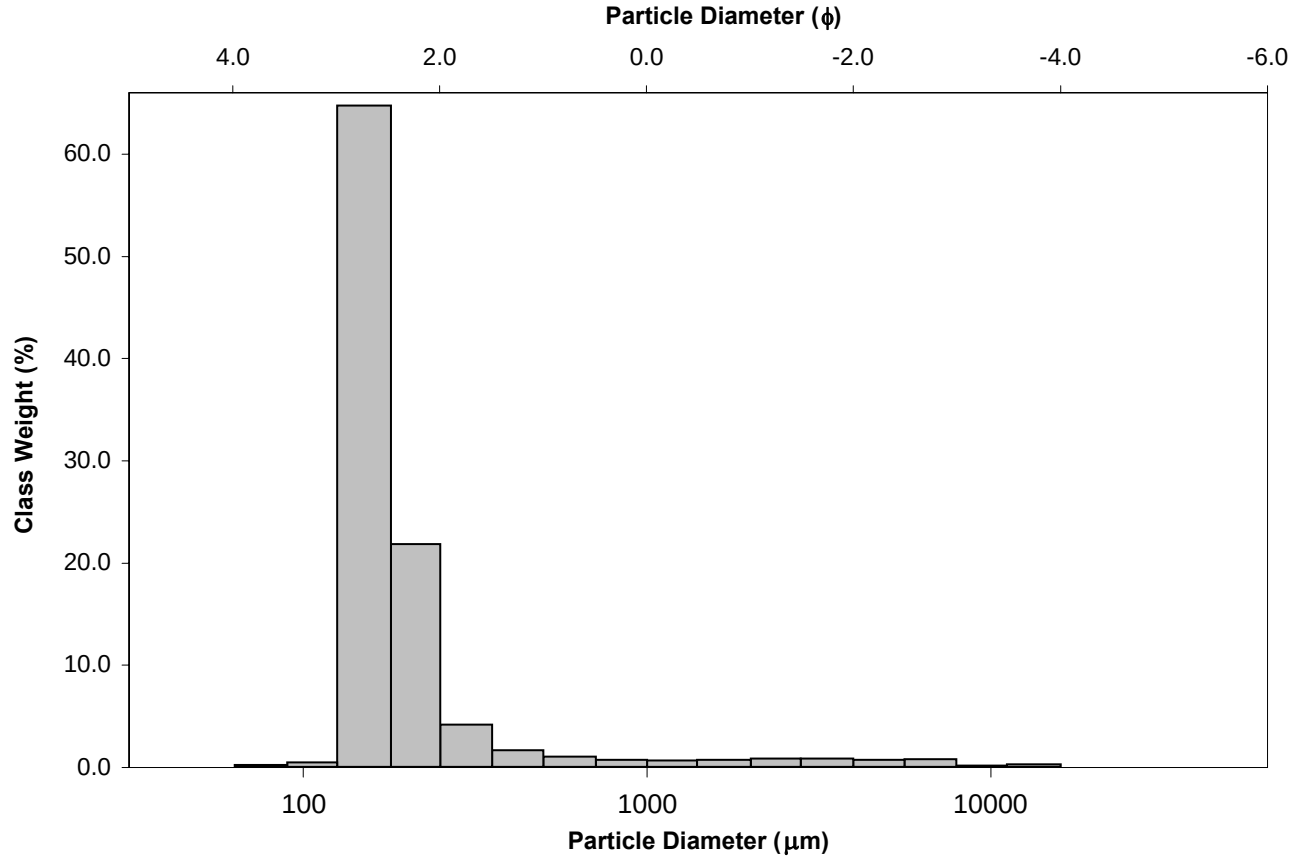
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.8	1.751
MEDIAN or D_{50}:	163.1	2.616
D_{90}:	297.1	2.935
(D_{90} / D_{10}):	2.272	1.676
(D_{90} - D_{10}):	166.3	1.184
(D_{75} / D_{25}):	1.423	1.221
(D_{75} - D_{25}):	60.14	0.509

GRAIN SIZE DISTRIBUTION

GRAVEL:	3.4%	COARSE SAND:	1.6%
SAND:	95.4%	MEDIUM SAND:	5.7%
MUD:	1.1%	FINE SAND:	86.2%
		V FINE SAND:	0.7%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.4%	MEDIUM SILT:	0.2%
FINE GRAVEL:	1.4%	FINE SILT:	0.2%
V FINE GRAVEL:	1.6%	V FINE SILT:	0.2%
V COARSE SAND:	1.3%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	375.1	192.1	2.380	172.9	2.532	Fine Sand
SORTING (σ):	1099.5	2.184	1.127	1.535	0.618	Moderately Well Sorted
SKEWNESS (Sk):	7.820	1.946	-1.946	0.530	-0.530	Very Coarse Skewed
KURTOSIS (K):	76.22	14.63	14.63	2.230	2.230	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_08**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

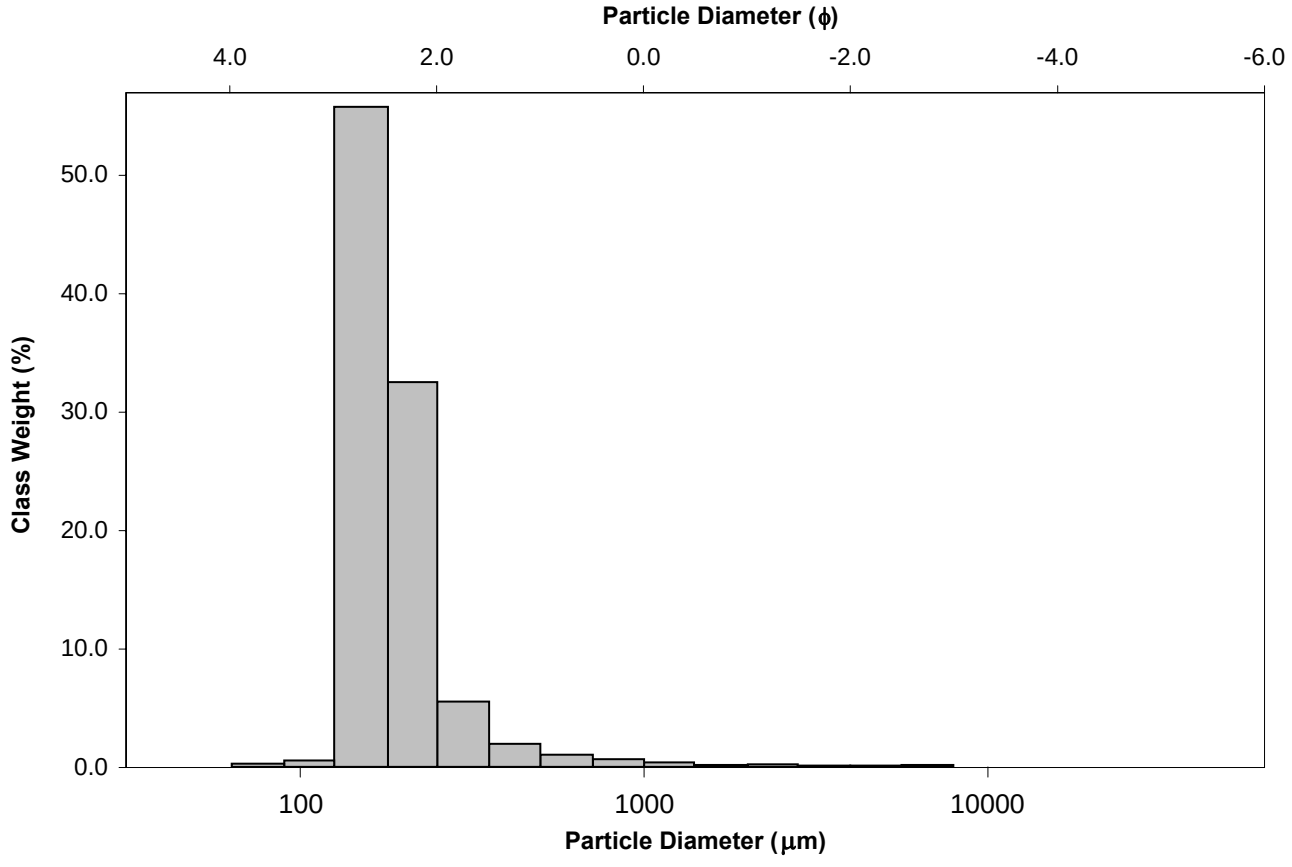
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.7	1.967
MEDIAN or D_{50}:	169.6	2.560
D_{90}:	255.8	2.925
(D_{90} / D_{10}):	1.943	1.487
(D_{90} - D_{10}):	124.1	0.958
(D_{75} / D_{25}):	1.473	1.251
(D_{75} - D_{25}):	68.46	0.559

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.7%	COARSE SAND:	1.6%
SAND:	98.3%	MEDIUM SAND:	7.4%
MUD:	1.0%	FINE SAND:	87.9%
		V FINE SAND:	0.8%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.3%	FINE SILT:	0.2%
V FINE GRAVEL:	0.4%	V FINE SILT:	0.2%
V COARSE SAND:	0.6%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	229.2	181.5	2.462	176.0	2.506	Fine Sand
SORTING (σ):	395.4	1.695	0.761	1.335	0.417	Well Sorted
SKEWNESS (Sk):	12.40	0.070	-0.070	0.322	-0.322	Very Coarse Skewed
KURTOSIS (K):	181.2	23.70	23.70	1.073	1.073	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_09**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

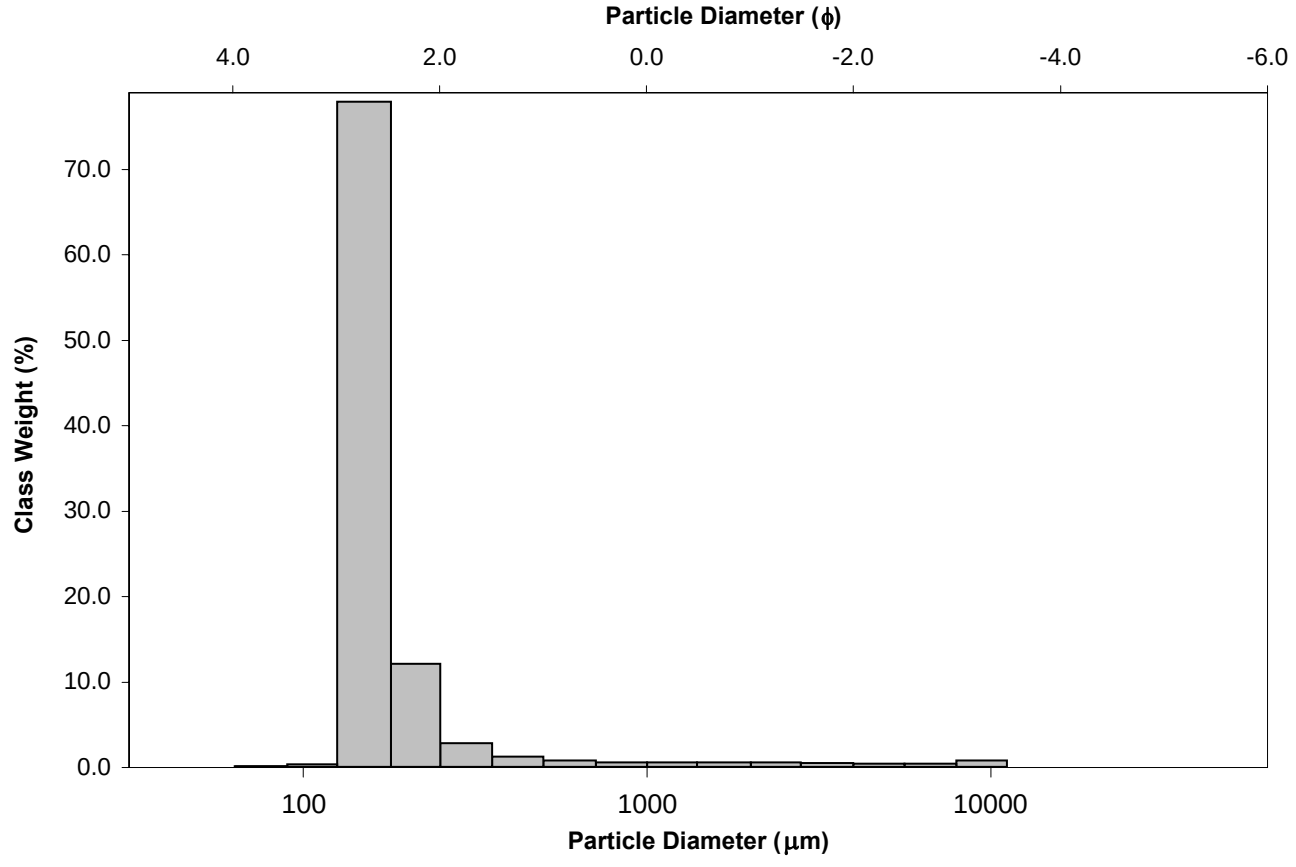
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	129.9	2.055
MEDIAN or D_{50}:	156.4	2.677
D_{90}:	240.6	2.945
(D_{90} / D_{10}):	1.852	1.433
(D_{90} - D_{10}):	110.7	0.889
(D_{75} / D_{25}):	1.261	1.133
(D_{75} - D_{25}):	36.38	0.335

GRAIN SIZE DISTRIBUTION

GRAVEL:	2.5%	COARSE SAND:	1.3%
SAND:	96.2%	MEDIUM SAND:	3.8%
MUD:	1.3%	FINE SAND:	89.5%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.7%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.8%	FINE SILT:	0.2%
V FINE GRAVEL:	1.0%	V FINE SILT:	0.2%
V COARSE SAND:	1.1%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	323.6	175.9	2.507	161.3	2.632	Fine Sand
SORTING (σ):	973.3	2.064	1.045	1.359	0.443	Well Sorted
SKEWNESS (Sk):	7.746	1.924	-1.924	0.460	-0.460	Very Coarse Skewed
KURTOSIS (K):	67.36	18.14	18.14	2.386	2.386	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_10**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Coarse Gravelly Fine Sand

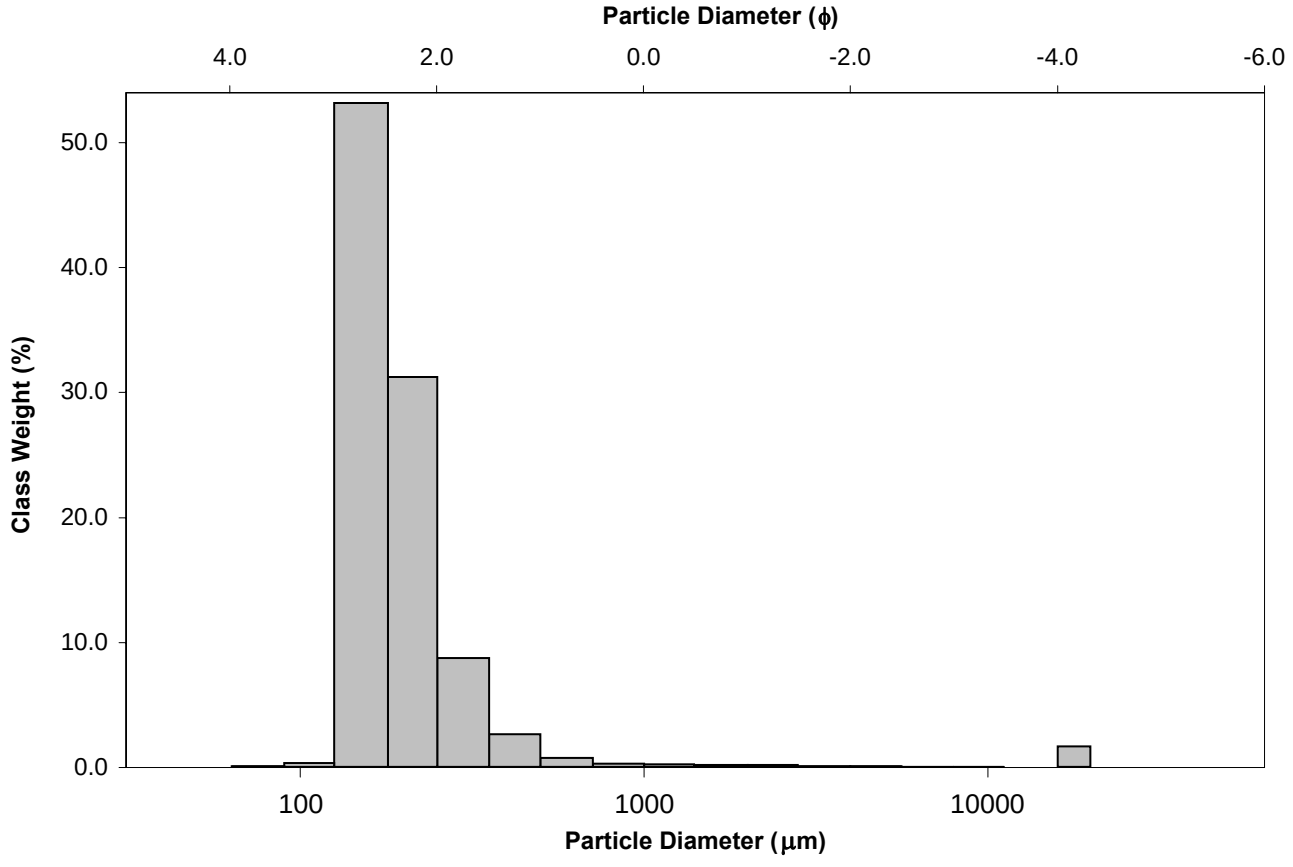
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	132.1	1.763
MEDIAN or D_{50}:	172.1	2.539
D_{90}:	294.6	2.920
(D_{90} / D_{10}):	2.230	1.656
(D_{90} - D_{10}):	162.5	1.157
(D_{75} / D_{25}):	1.515	1.275
(D_{75} - D_{25}):	75.14	0.599

GRAIN SIZE DISTRIBUTION

GRAVEL:	1.5%	COARSE SAND:	1.0%
SAND:	97.3%	MEDIUM SAND:	11.2%
MUD:	1.3%	FINE SAND:	84.3%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	1.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.1%	FINE SILT:	0.2%
V FINE GRAVEL:	0.3%	V FINE SILT:	0.2%
V COARSE SAND:	0.4%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	399.5	189.4	2.400	179.5	2.478	Fine Sand
SORTING (σ):	1820.3	2.001	1.001	1.359	0.442	Well Sorted
SKEWNESS (Sk):	9.362	2.205	-2.205	0.333	-0.333	Very Coarse Skewed
KURTOSIS (K):	90.02	26.78	26.78	1.058	1.058	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_11**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

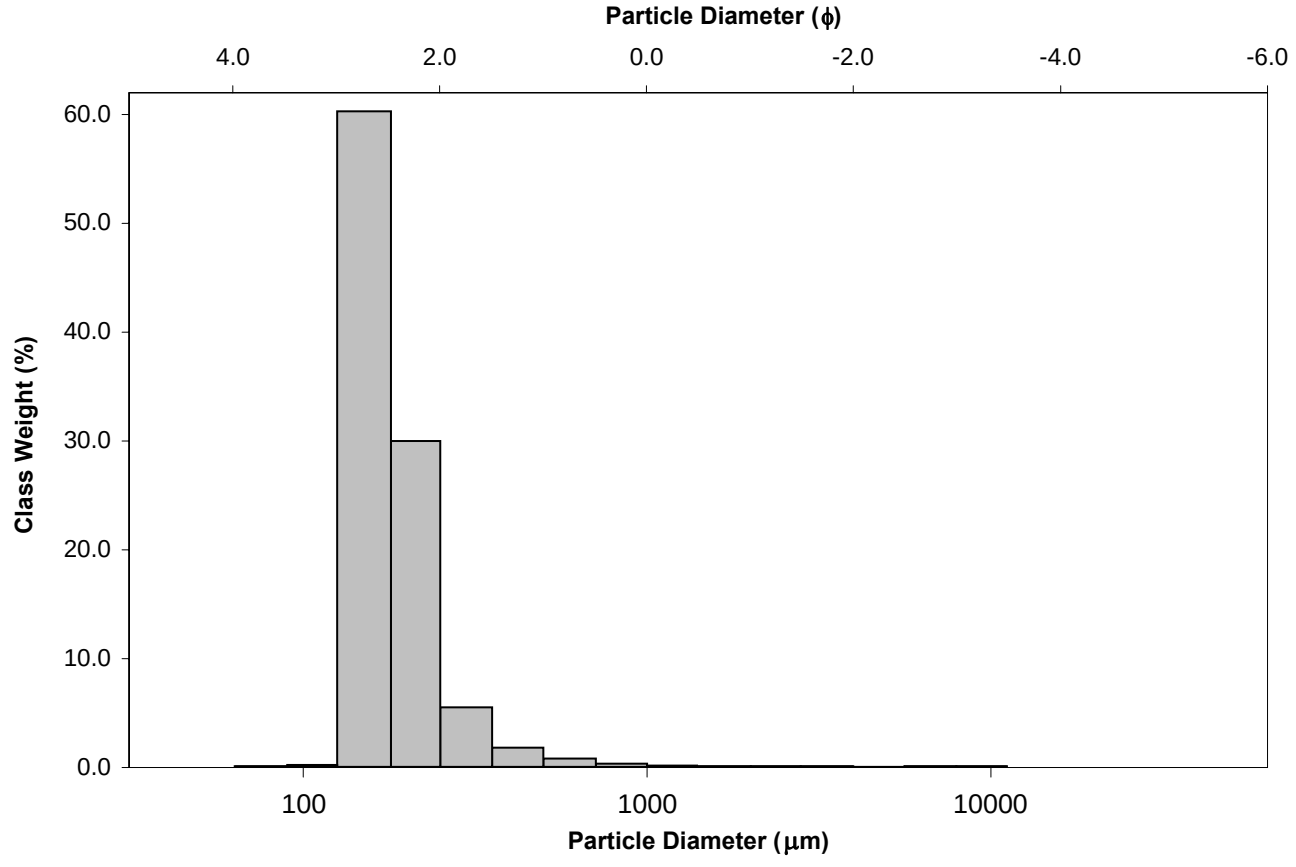
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.3	2.020
MEDIAN or D_{50}:	166.2	2.589
D_{90}:	246.6	2.929
(D_{90} / D_{10}):	1.879	1.450
(D_{90} - D_{10}):	115.3	0.910
(D_{75} / D_{25}):	1.439	1.231
(D_{75} - D_{25}):	62.93	0.525

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.4%	COARSE SAND:	1.0%
SAND:	98.2%	MEDIUM SAND:	7.2%
MUD:	1.4%	FINE SAND:	89.5%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.1%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.1%	FINE SILT:	0.2%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.2%
V COARSE SAND:	0.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	211.3	173.1	2.530	173.1	2.530	Fine Sand
SORTING (σ):	391.0	1.671	0.741	1.311	0.391	Well Sorted
SKEWNESS (Sk):	18.32	-1.352	1.352	0.329	-0.329	Very Coarse Skewed
KURTOSIS (K):	385.7	27.90	27.90	1.040	1.040	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_12**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Bimodal, Very Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Coarse Gravelly Fine Sand

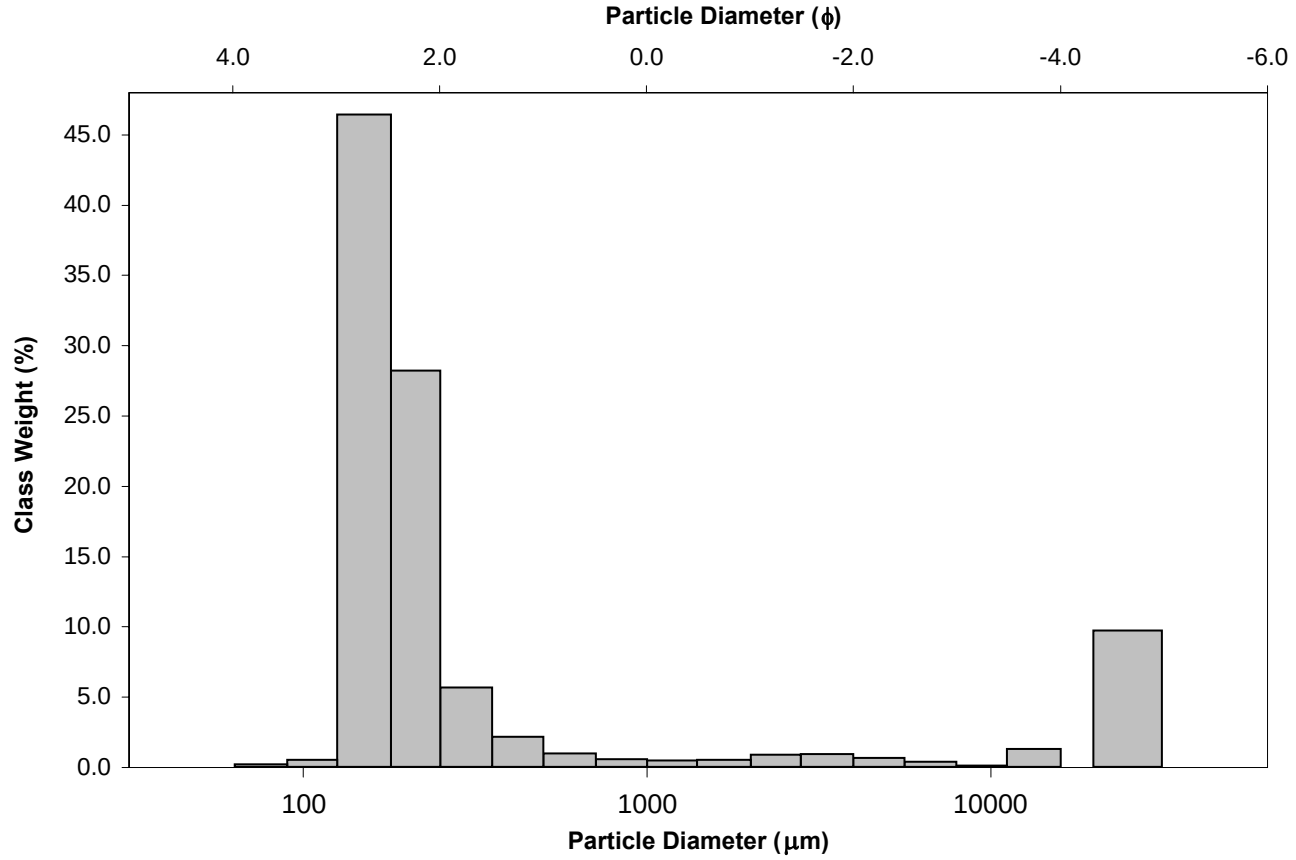
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:	25750.0	-4.650
MODE 3:		
D_{10}:	133.3	-4.437
MEDIAN or D_{50}:	183.8	2.444
D_{90}:	21655.4	2.907
(D_{90} / D_{10}):	162.4	-0.655
(D_{90} - D_{10}):	21522.1	7.343
(D_{75} / D_{25}):	1.785	1.439
(D_{75} - D_{25}):	117.7	0.836

GRAIN SIZE DISTRIBUTION

GRAVEL:	16.1%	COARSE SAND:	1.5%
SAND:	82.9%	MEDIUM SAND:	7.6%
MUD:	1.0%	FINE SAND:	72.2%
		V FINE SAND:	0.7%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	12.1%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	1.3%	MEDIUM SILT:	0.2%
FINE GRAVEL:	1.0%	FINE SILT:	0.2%
V FINE GRAVEL:	1.7%	V FINE SILT:	0.2%
V COARSE SAND:	0.9%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	3577.5	376.6	1.409	377.0	1.407	Medium Sand
SORTING (σ):	8394.1	5.846	2.547	4.399	2.137	Very Poorly Sorted
SKEWNESS (Sk):	2.201	1.613	-1.613	0.831	-0.831	Very Coarse Skewed
KURTOSIS (K):	5.949	4.462	4.462	3.761	3.761	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_13**

ANALYST & DATE: michelle.grey, 8/8/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

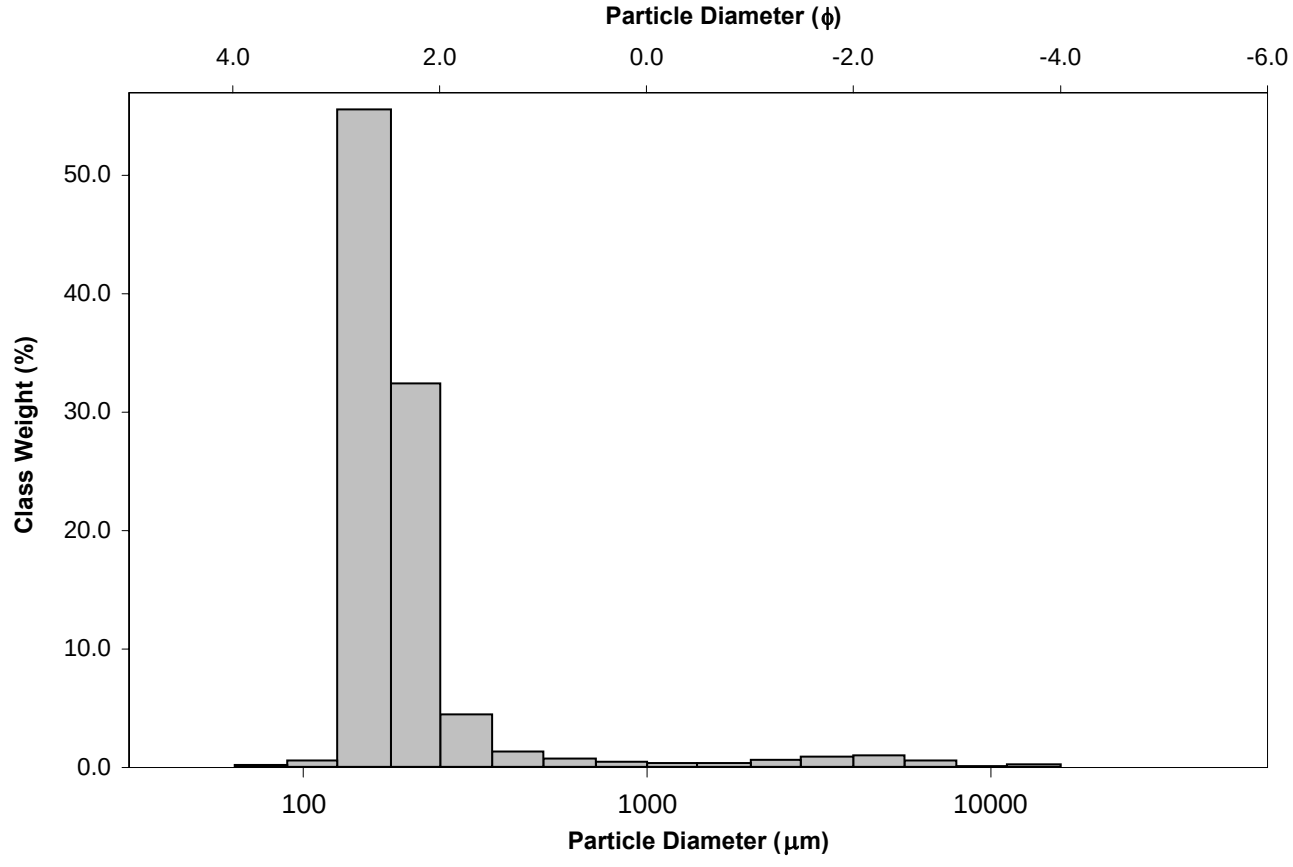
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.6	1.915
MEDIAN or D_{50}:	169.8	2.558
D_{90}:	265.3	2.926
(D_{90} / D_{10}):	2.016	1.528
(D_{90} - D_{10}):	133.7	1.012
(D_{75} / D_{25}):	1.478	1.253
(D_{75} - D_{25}):	69.18	0.564

GRAIN SIZE DISTRIBUTION

GRAVEL:	3.2%	COARSE SAND:	1.2%
SAND:	95.5%	MEDIUM SAND:	5.7%
MUD:	1.3%	FINE SAND:	87.3%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.3%	MEDIUM SILT:	0.2%
FINE GRAVEL:	1.4%	FINE SILT:	0.2%
V FINE GRAVEL:	1.4%	V FINE SILT:	0.2%
V COARSE SAND:	0.7%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	350.9	192.0	2.381	176.3	2.504	Fine Sand
SORTING (σ):	1002.9	2.114	1.080	1.416	0.501	Moderately Well Sorted
SKEWNESS (Sk):	8.348	1.652	-1.652	0.397	-0.397	Very Coarse Skewed
KURTOSIS (K):	88.97	16.13	16.13	1.461	1.461	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_14**

ANALYST & DATE: michelle.grey, 8/9/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

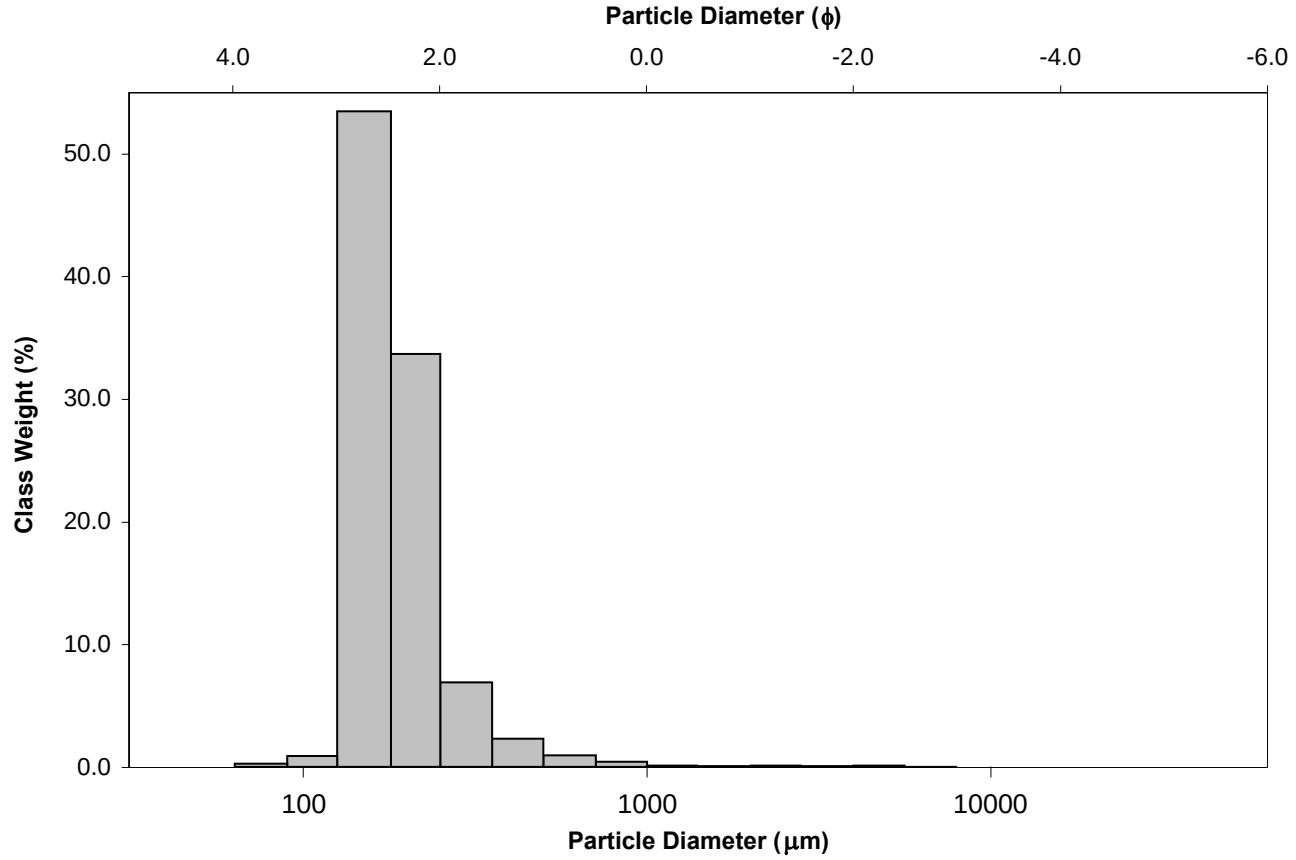
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.4	1.923
MEDIAN or D_{50}:	171.2	2.547
D_{90}:	263.7	2.928
(D_{90} / D_{10}):	2.006	1.522
(D_{90} - D_{10}):	132.3	1.005
(D_{75} / D_{25}):	1.488	1.259
(D_{75} - D_{25}):	70.85	0.574

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.3%	COARSE SAND:	1.4%
SAND:	98.4%	MEDIUM SAND:	9.1%
MUD:	1.3%	FINE SAND:	86.6%
		V FINE SAND:	1.1%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.2%	FINE SILT:	0.2%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.2%
V COARSE SAND:	0.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	209.2	178.2	2.489	177.1	2.497	Fine Sand
SORTING (σ):	251.5	1.657	0.729	1.333	0.414	Well Sorted
SKEWNESS (Sk):	15.82	-1.747	1.747	0.291	-0.291	Coarse Skewed
KURTOSIS (K):	310.1	25.07	25.07	1.016	1.016	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_15**

ANALYST & DATE: michelle.grey, 8/9/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

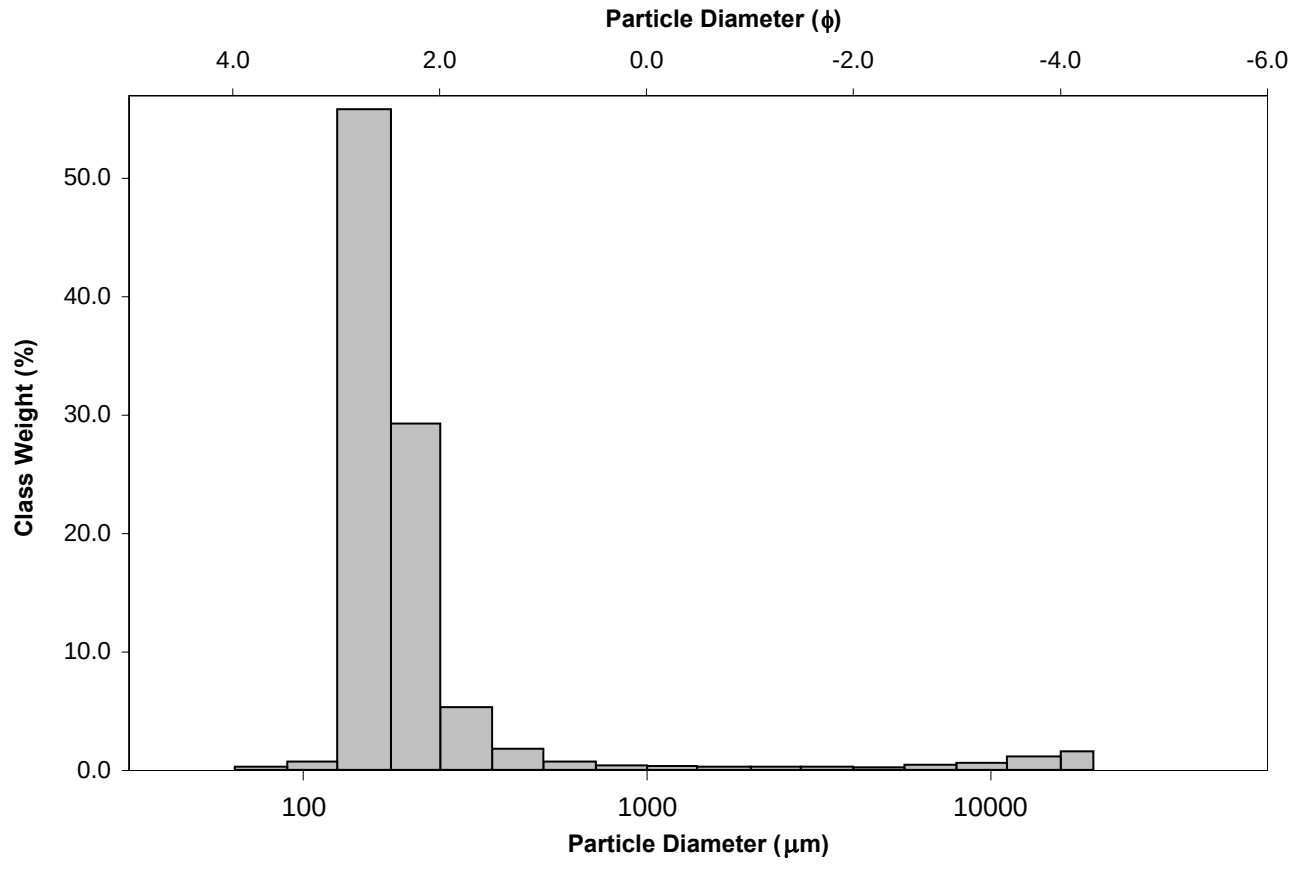
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.6	1.731
MEDIAN or D_{50}:	169.3	2.563
D_{90}:	301.2	2.926
(D_{90} / D_{10}):	2.289	1.690
(D_{90} - D_{10}):	169.6	1.195
(D_{75} / D_{25}):	1.494	1.262
(D_{75} - D_{25}):	71.44	0.579

GRAIN SIZE DISTRIBUTION

GRAVEL:	4.0%	COARSE SAND:	1.1%
SAND:	95.1%	MEDIUM SAND:	7.1%
MUD:	0.9%	FINE SAND:	85.3%
		V FINE SAND:	1.0%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	1.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	1.8%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.7%	FINE SILT:	0.2%
V FINE GRAVEL:	0.5%	V FINE SILT:	0.2%
V COARSE SAND:	0.6%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	643.9	205.8	2.281	177.2	2.496	Fine Sand
SORTING (σ):	2429.4	2.478	1.309	1.497	0.582	Moderately Well Sorted
SKEWNESS (Sk):	5.792	2.919	-2.919	0.458	-0.458	Very Coarse Skewed
KURTOSIS (K):	36.72	16.44	16.44	1.766	1.766	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_16**

ANALYST & DATE: michelle.grey, 8/9/2012

SAMPLE TYPE: Unimodal, Moderately Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

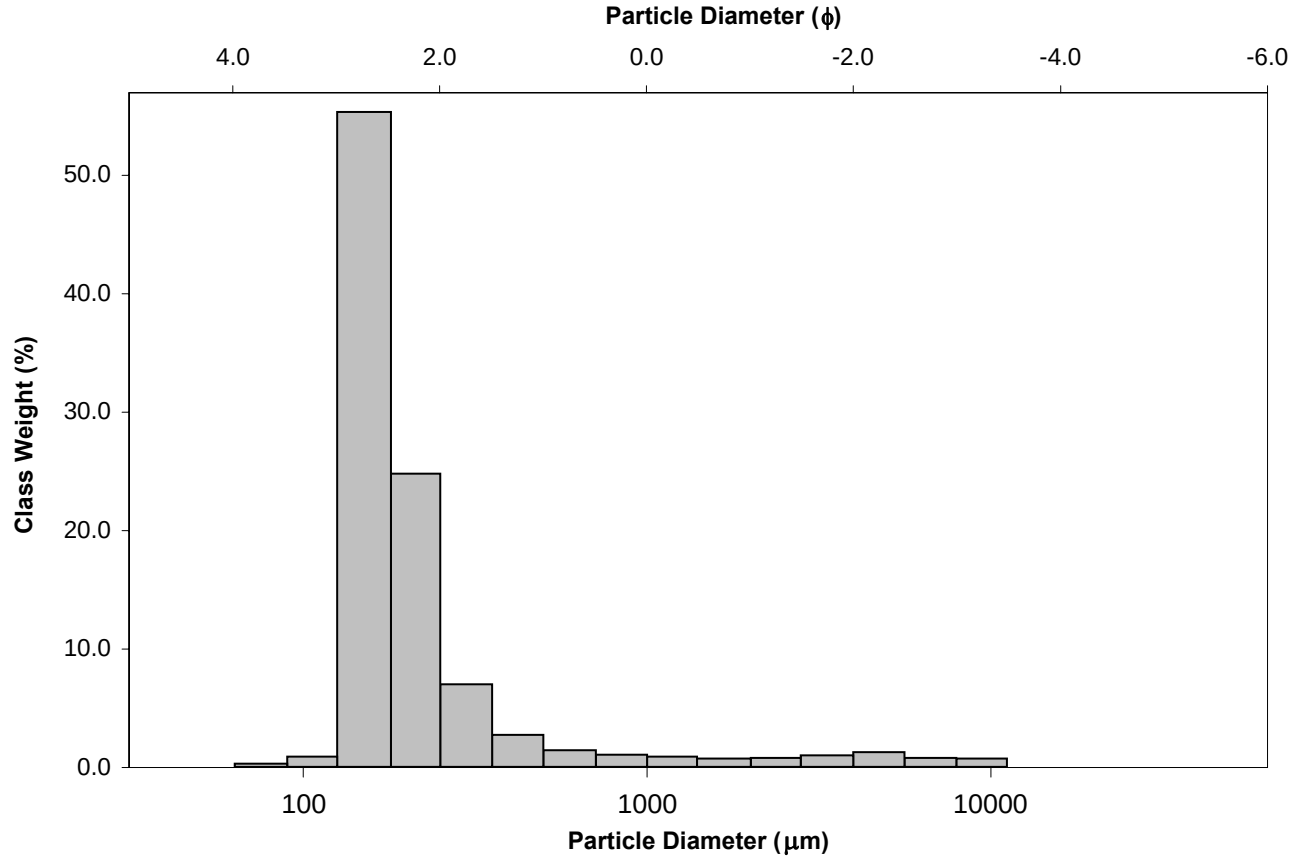
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.1	1.315
MEDIAN or D_{50}:	169.6	2.560
D_{90}:	402.0	2.931
(D_{90} / D_{10}):	3.065	2.229
(D_{90} - D_{10}):	270.9	1.616
(D_{75} / D_{25}):	1.562	1.299
(D_{75} - D_{25}):	81.14	0.643

GRAIN SIZE DISTRIBUTION

GRAVEL:	4.3%	COARSE SAND:	2.4%
SAND:	94.2%	MEDIUM SAND:	9.5%
MUD:	1.4%	FINE SAND:	79.6%
		V FINE SAND:	1.1%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.7%	MEDIUM SILT:	0.2%
FINE GRAVEL:	2.0%	FINE SILT:	0.2%
V FINE GRAVEL:	1.7%	V FINE SILT:	0.2%
V COARSE SAND:	1.6%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	434.8	208.2	2.264	185.1	2.434	Fine Sand
SORTING (σ):	1143.5	2.392	1.258	1.723	0.785	Moderately Sorted
SKEWNESS (Sk):	5.722	1.542	-1.542	0.569	-0.569	Very Coarse Skewed
KURTOSIS (K):	38.66	11.16	11.16	2.239	2.239	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_17**

ANALYST & DATE: michelle.grey, 9/7/2012

SAMPLE TYPE: Unimodal, Very Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Medium Gravelly Fine Sand

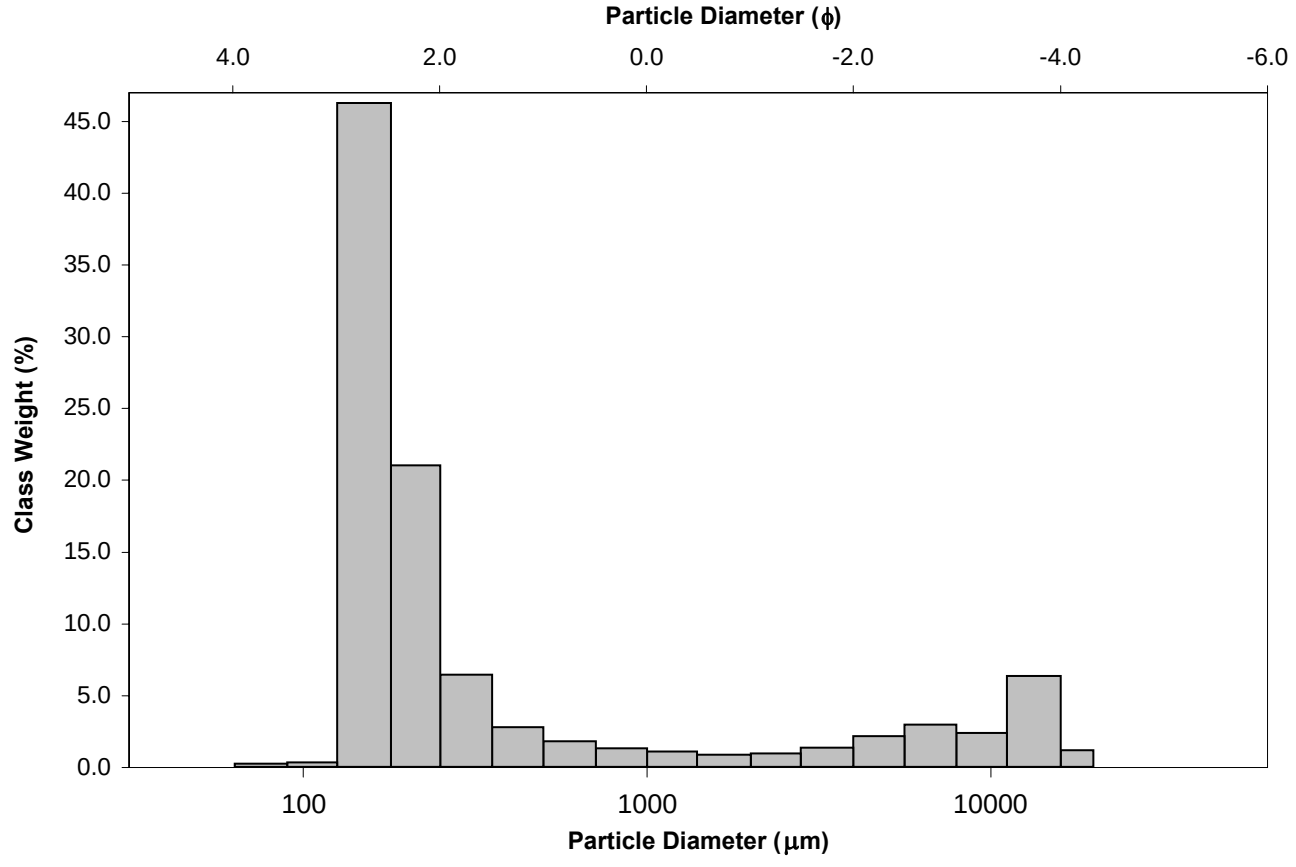
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	133.0	-2.900
MEDIAN or D_{50}:	181.1	2.465
D_{90}:	7465.1	2.911
(D_{90} / D_{10}):	56.14	-1.004
(D_{90} - D_{10}):	7332.1	5.811
(D_{75} / D_{25}):	2.306	1.783
(D_{75} - D_{25}):	194.8	1.206

GRAIN SIZE DISTRIBUTION

GRAVEL:	16.8%	COARSE SAND:	3.1%
SAND:	81.9%	MEDIUM SAND:	9.1%
MUD:	1.3%	FINE SAND:	67.3%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.8%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	8.7%	MEDIUM SILT:	0.2%
FINE GRAVEL:	5.0%	FINE SILT:	0.2%
V FINE GRAVEL:	2.3%	V FINE SILT:	0.2%
V COARSE SAND:	1.9%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	1790.6	353.0	1.502	405.6	1.302	Medium Sand
SORTING (σ):	3916.0	4.656	2.219	4.188	2.066	Very Poorly Sorted
SKEWNESS (Sk):	2.492	1.281	-1.281	0.835	-0.835	Very Coarse Skewed
KURTOSIS (K):	7.993	4.012	4.012	2.252	2.252	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_18** ANALYST & DATE: michelle.grey, 9/7/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

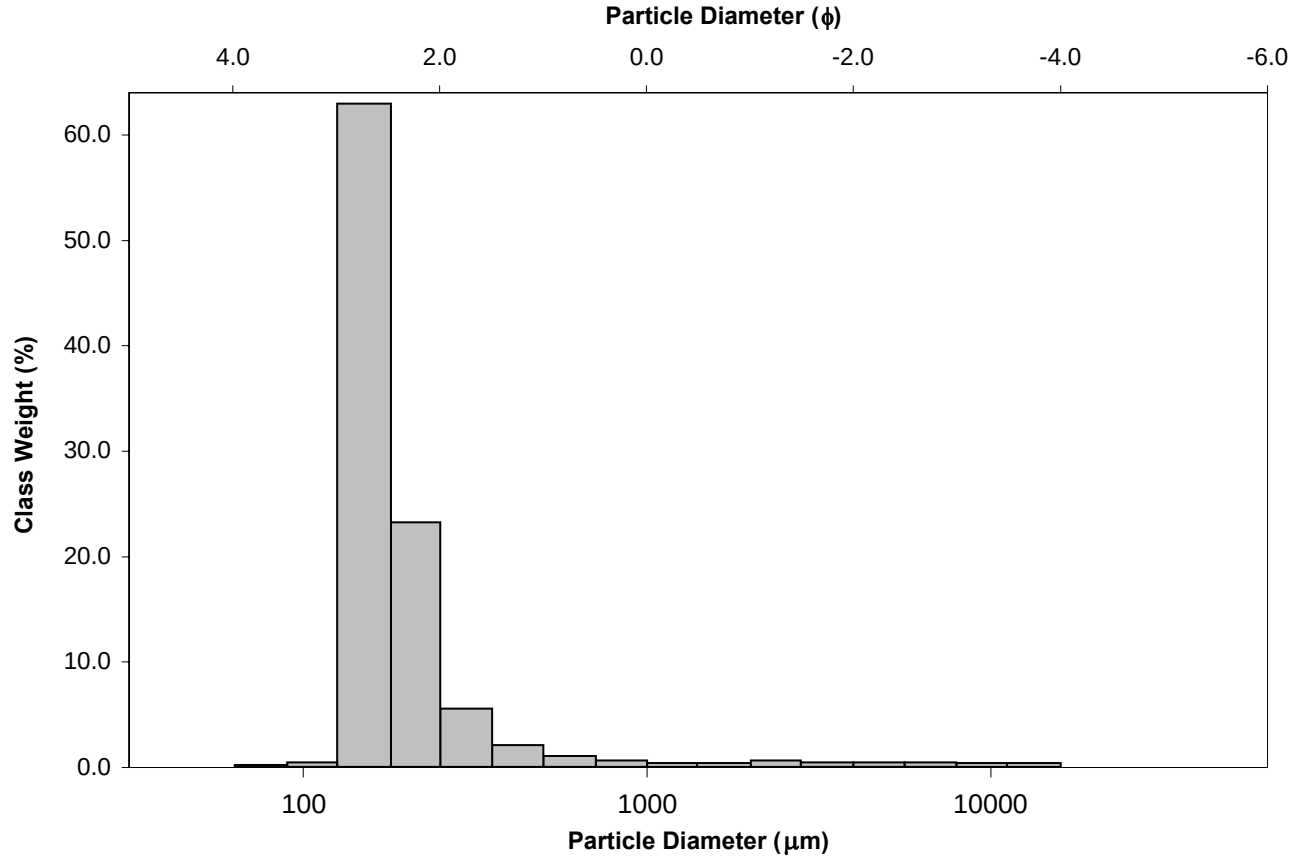
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.9	1.771
MEDIAN or D_{50}:	164.2	2.606
D_{90}:	293.1	2.933
(D_{90} / D_{10}):	2.238	1.656
(D_{90} - D_{10}):	162.1	1.162
(D_{75} / D_{25}):	1.446	1.234
(D_{75} - D_{25}):	63.63	0.532

GRAIN SIZE DISTRIBUTION

GRAVEL:	2.7%	COARSE SAND:	1.6%
SAND:	96.2%	MEDIUM SAND:	7.4%
MUD:	1.1%	FINE SAND:	85.7%
		V FINE SAND:	0.7%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.8%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.9%	FINE SILT:	0.2%
V FINE GRAVEL:	1.0%	V FINE SILT:	0.2%
V COARSE SAND:	0.7%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	362.6	189.1	2.402	174.0	2.523	Fine Sand
SORTING (σ):	1180.5	2.086	1.061	1.417	0.503	Moderately Well Sorted
SKEWNESS (Sk):	8.372	2.064	-2.064	0.471	-0.471	Very Coarse Skewed
KURTOSIS (K):	80.55	18.00	18.00	1.534	1.534	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_19**

ANALYST & DATE: michelle.grey, 9/7/2012

SAMPLE TYPE: Unimodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Fine Gravelly Fine Sand

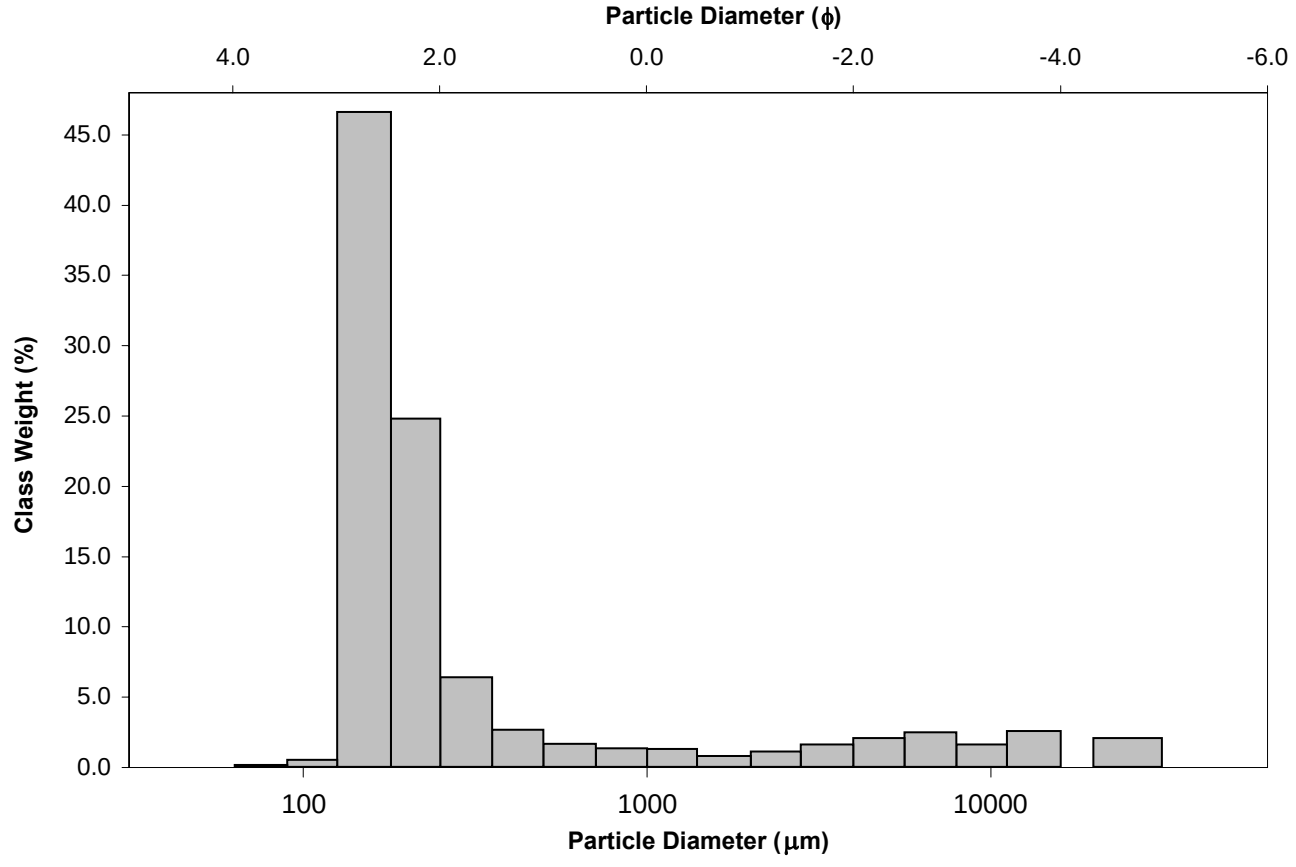
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	133.1	-2.279
MEDIAN or D_{50}:	181.0	2.466
D_{90}:	4852.0	2.910
(D_{90} / D_{10}):	36.47	-1.277
(D_{90} - D_{10}):	4719.0	5.189
(D_{75} / D_{25}):	1.923	1.524
(D_{75} - D_{25}):	137.7	0.943

GRAIN SIZE DISTRIBUTION

GRAVEL:	13.8%	COARSE SAND:	2.9%
SAND:	85.0%	MEDIUM SAND:	8.8%
MUD:	1.2%	FINE SAND:	70.7%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	2.6%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	4.1%	MEDIUM SILT:	0.2%
FINE GRAVEL:	4.4%	FINE SILT:	0.2%
V FINE GRAVEL:	2.7%	V FINE SILT:	0.2%
V COARSE SAND:	1.9%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	1712.6	317.8	1.654	286.2	1.805	Medium Sand
SORTING (σ):	4746.4	4.227	2.080	3.178	1.668	Poorly Sorted
SKEWNESS (Sk):	3.888	1.586	-1.586	0.785	-0.785	Very Coarse Skewed
KURTOSIS (K):	18.41	5.310	5.310	2.819	2.819	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_20**

ANALYST & DATE: michelle.grey, 9/7/2012

SAMPLE TYPE: Unimodal, Very Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Fine Gravelly Fine Sand

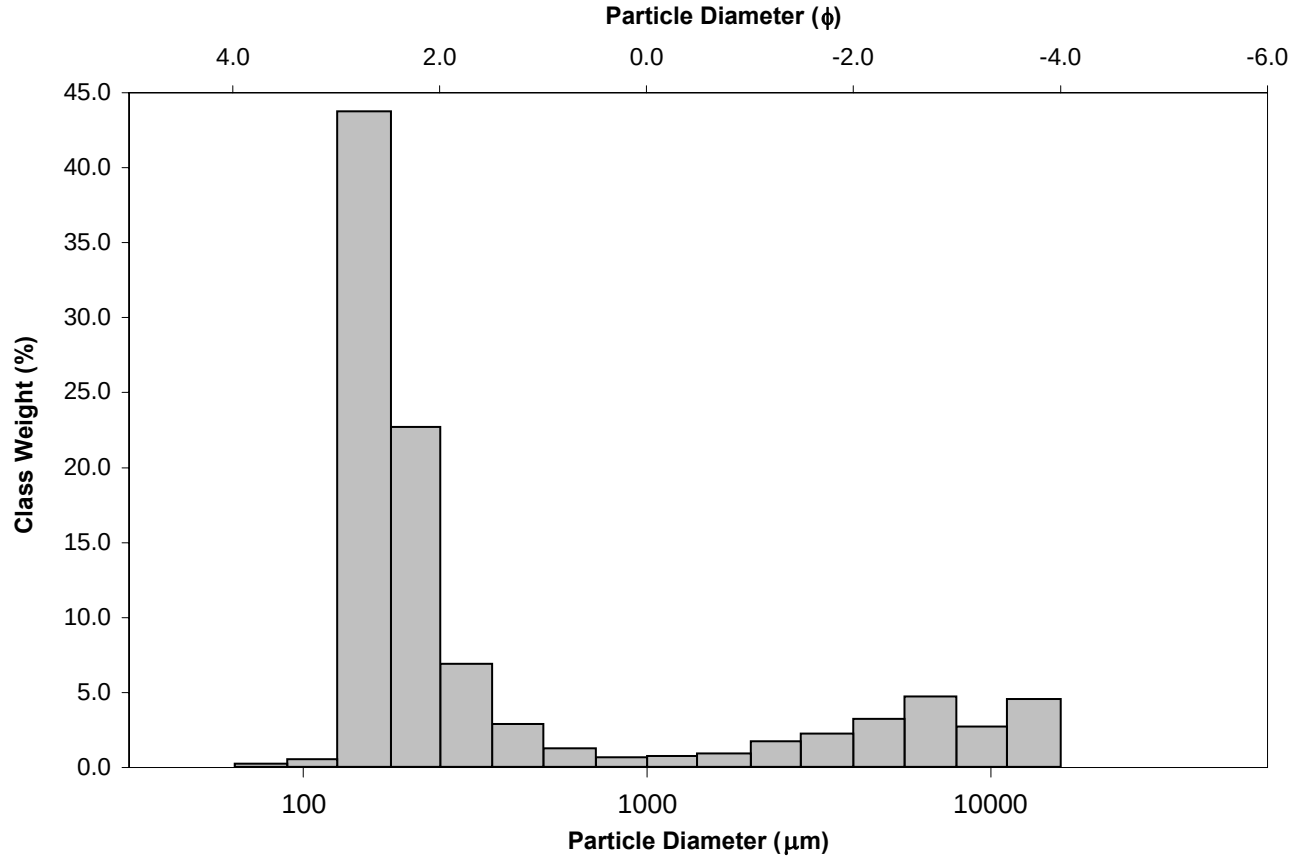
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	133.7	-2.688
MEDIAN or D_{50}:	188.9	2.404
D_{90}:	6446.4	2.903
(D_{90} / D_{10}):	48.22	-1.080
(D_{90} - D_{10}):	6312.7	5.592
(D_{75} / D_{25}):	2.380	1.846
(D_{75} - D_{25}):	208.1	1.251

GRAIN SIZE DISTRIBUTION

GRAVEL:	18.8%	COARSE SAND:	1.8%
SAND:	80.2%	MEDIUM SAND:	9.7%
MUD:	0.9%	FINE SAND:	66.4%
		V FINE SAND:	0.7%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	7.1%	MEDIUM SILT:	0.2%
FINE GRAVEL:	7.8%	FINE SILT:	0.2%
V FINE GRAVEL:	3.9%	V FINE SILT:	0.2%
V COARSE SAND:	1.6%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	1637.2	367.0	1.446	447.3	1.161	Medium Sand
SORTING (σ):	3384.3	4.478	2.163	4.321	2.111	Very Poorly Sorted
SKEWNESS (Sk):	2.484	1.236	-1.236	0.819	-0.819	Very Coarse Skewed
KURTOSIS (K):	8.216	3.635	3.635	2.085	2.085	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_21**

ANALYST & DATE: michelle.grey, 9/7/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

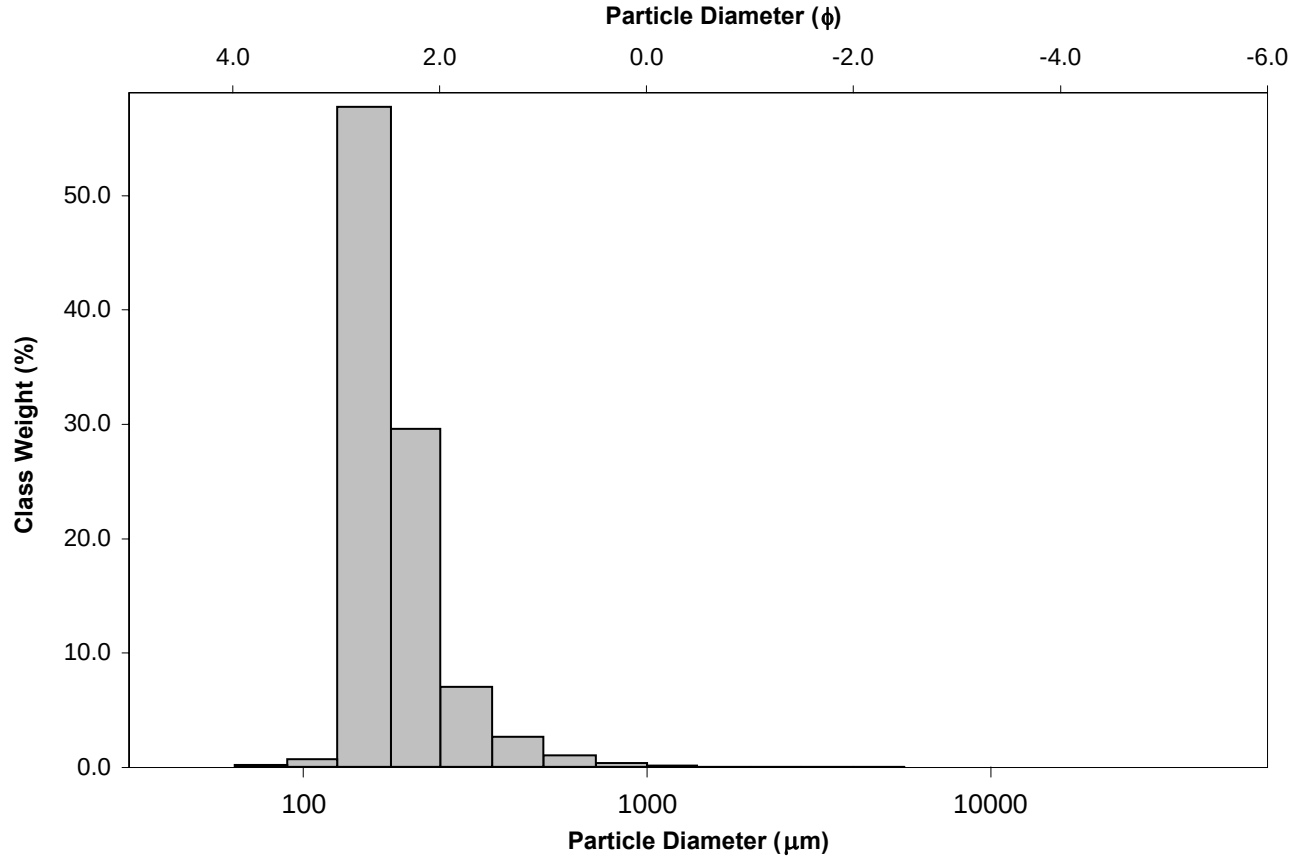
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.4	1.913
MEDIAN or D_{50}:	167.9	2.574
D_{90}:	265.5	2.928
(D_{90} / D_{10}):	2.021	1.530
(D_{90} - D_{10}):	134.1	1.015
(D_{75} / D_{25}):	1.471	1.249
(D_{75} - D_{25}):	67.91	0.557

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	1.3%
SAND:	98.8%	MEDIUM SAND:	9.5%
MUD:	1.1%	FINE SAND:	86.9%
		V FINE SAND:	0.8%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.0%	FINE SILT:	0.2%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.2%
V COARSE SAND:	0.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	198.9	176.5	2.503	175.5	2.511	Fine Sand
SORTING (σ):	156.1	1.584	0.664	1.332	0.413	Well Sorted
SKEWNESS (Sk):	16.43	-2.230	2.230	0.340	-0.340	Very Coarse Skewed
KURTOSIS (K):	404.4	26.63	26.63	1.045	1.045	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_22**

ANALYST & DATE: michelle.grey, 9/7/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

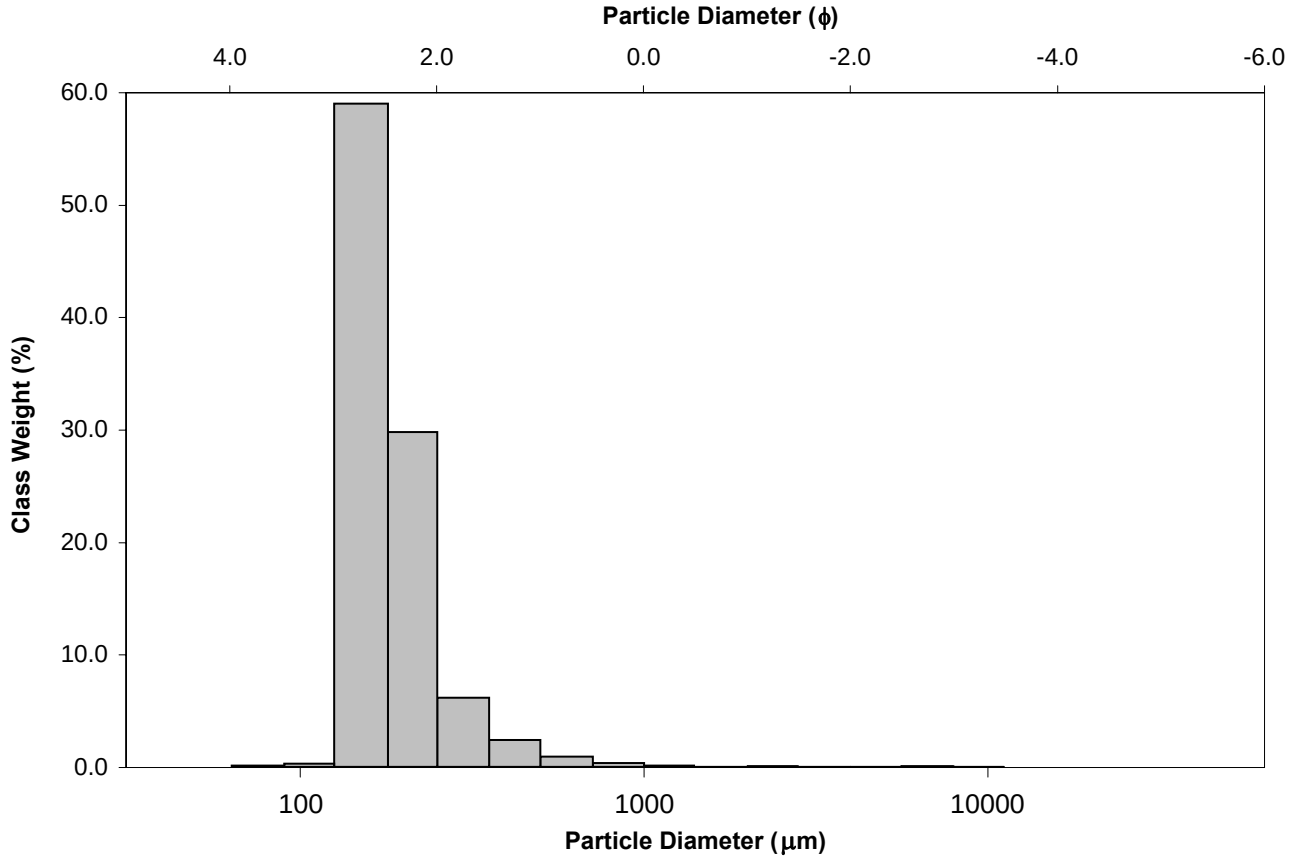
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.5	1.985
MEDIAN or D_{50}:	167.2	2.580
D_{90}:	252.5	2.927
(D_{90} / D_{10}):	1.920	1.474
(D_{90} - D_{10}):	121.0	0.941
(D_{75} / D_{25}):	1.456	1.240
(D_{75} - D_{25}):	65.63	0.542

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.3%	COARSE SAND:	1.3%
SAND:	98.6%	MEDIUM SAND:	8.5%
MUD:	1.2%	FINE SAND:	88.3%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.1%	FINE SILT:	0.2%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.2%
V COARSE SAND:	0.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	206.2	175.5	2.510	174.5	2.518	Fine Sand
SORTING (σ):	311.5	1.620	0.696	1.325	0.406	Well Sorted
SKEWNESS (Sk):	21.62	-1.636	1.636	0.341	-0.341	Very Coarse Skewed
KURTOSIS (K):	548.8	28.24	28.24	1.058	1.058	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_23**

ANALYST & DATE: michelle.grey, 9/7/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

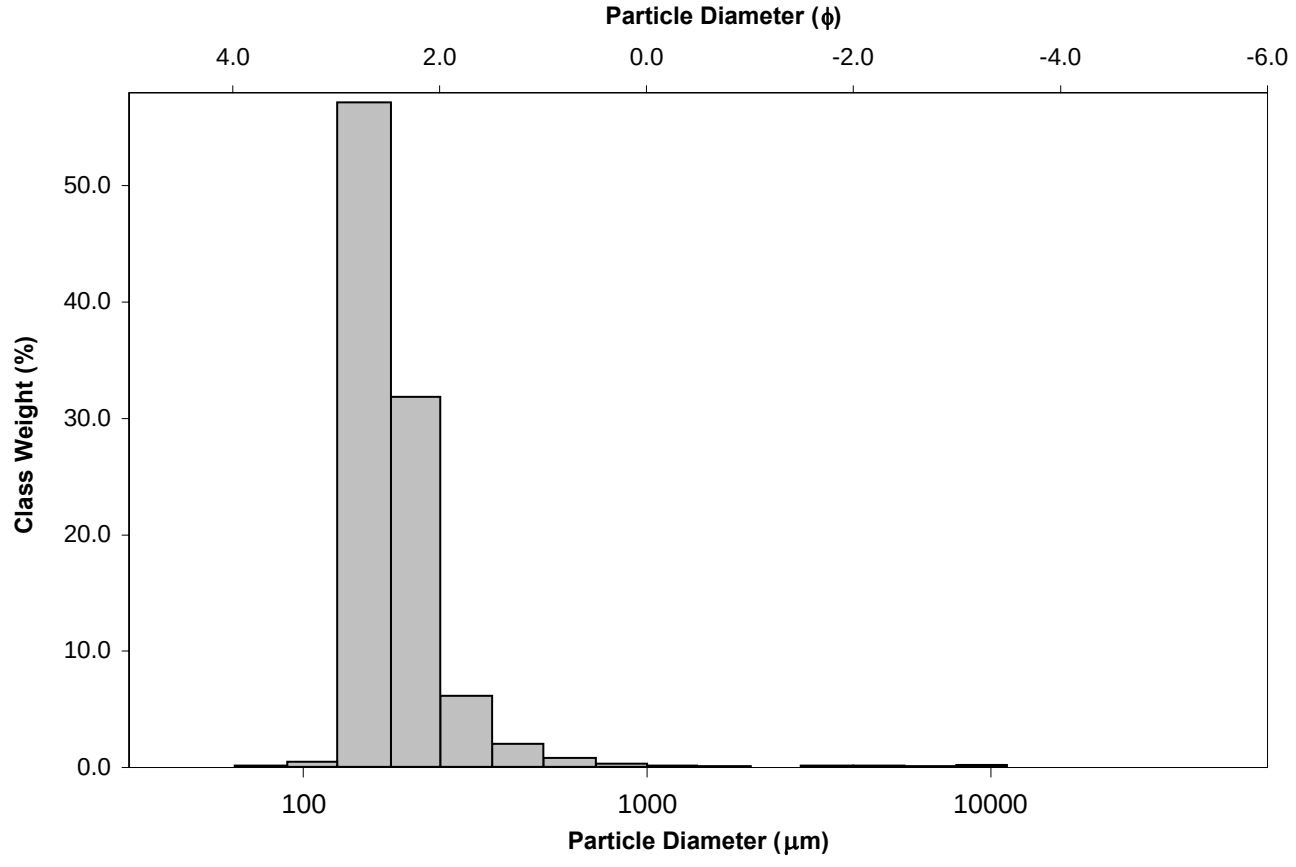
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.5	2.003
MEDIAN or D_{50}:	168.5	2.569
D_{90}:	249.5	2.927
(D_{90} / D_{10}):	1.898	1.461
(D_{90} - D_{10}):	118.0	0.924
(D_{75} / D_{25}):	1.463	1.245
(D_{75} - D_{25}):	66.84	0.549

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.5%	COARSE SAND:	1.1%
SAND:	98.2%	MEDIUM SAND:	8.0%
MUD:	1.2%	FINE SAND:	88.3%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.2%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.2%	FINE SILT:	0.2%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.2%
V COARSE SAND:	0.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	226.8	176.9	2.499	175.1	2.514	Fine Sand
SORTING (σ):	519.4	1.689	0.756	1.321	0.402	Well Sorted
SKEWNESS (Sk):	15.33	-0.454	0.454	0.314	-0.314	Very Coarse Skewed
KURTOSIS (K):	256.8	28.66	28.66	1.026	1.026	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_24**

ANALYST & DATE: Dan Gregory, 10/4/2012

SAMPLE TYPE: Unimodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Fine Gravelly Fine Sand

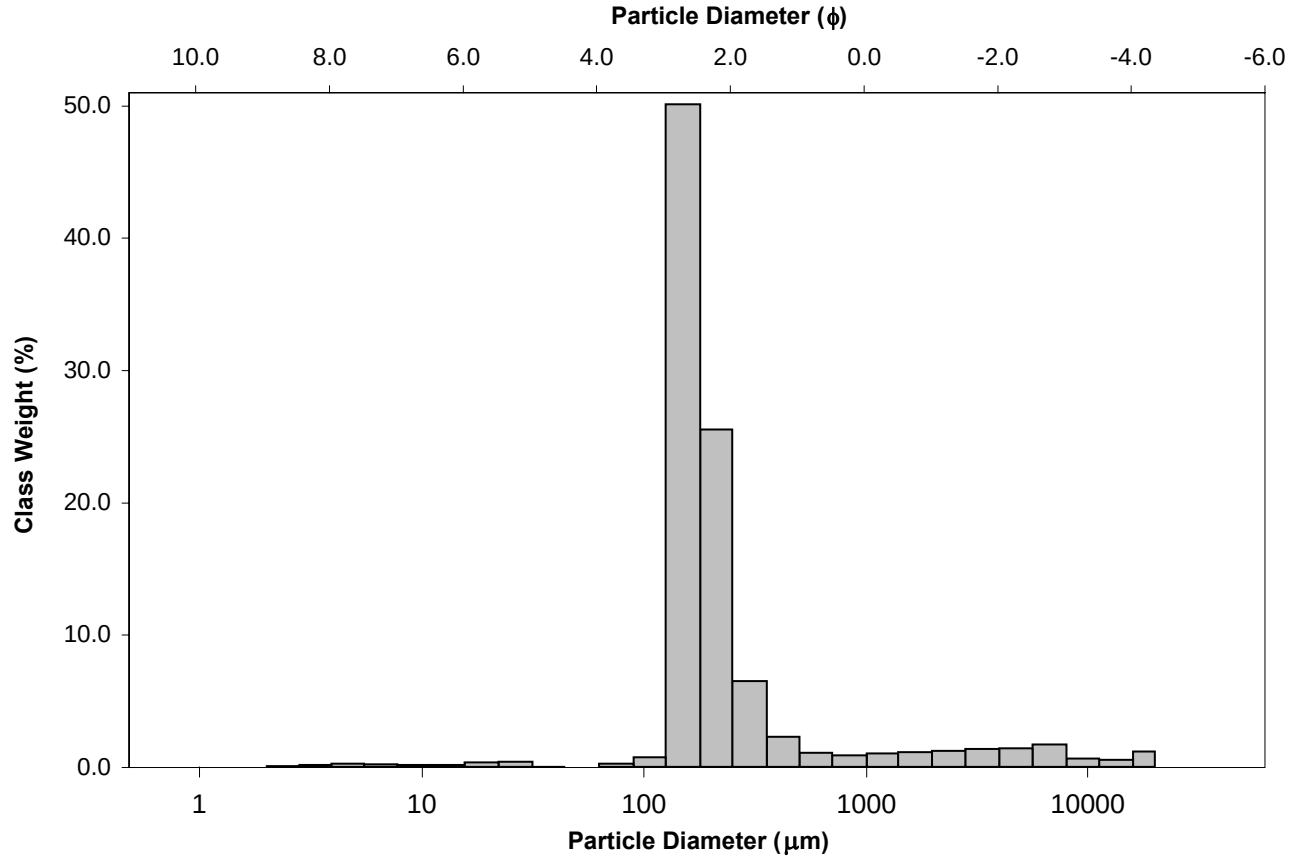
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.3	0.095
MEDIAN or D_{50}:	173.4	2.527
D_{90}:	936.2	2.929
(D_{90} / D_{10}):	7.127	30.77
(D_{90} - D_{10}):	804.8	2.833
(D_{75} / D_{25}):	1.615	1.331
(D_{75} - D_{25}):	89.59	0.691

GRAIN SIZE DISTRIBUTION

GRAVEL:	7.7%	COARSE SAND:	2.0%
SAND:	90.4%	MEDIUM SAND:	8.7%
MUD:	1.9%	FINE SAND:	76.6%
		V FINE SAND:	0.9%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.8%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	1.2%	MEDIUM SILT:	0.4%
FINE GRAVEL:	3.2%	FINE SILT:	0.5%
V FINE GRAVEL:	2.6%	V FINE SILT:	0.3%
V COARSE SAND:	2.2%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	740.8	235.8	2.085	196.6	2.347	Fine Sand
SORTING (σ):	2224.6	3.022	1.595	2.091	1.064	Poorly Sorted
SKEWNESS (Sk):	5.455	1.575	-1.575	0.631	-0.631	Very Coarse Skewed
KURTOSIS (K):	36.39	8.359	8.359	2.968	2.968	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_25** ANALYST & DATE: Dan Gregory, 10/4/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

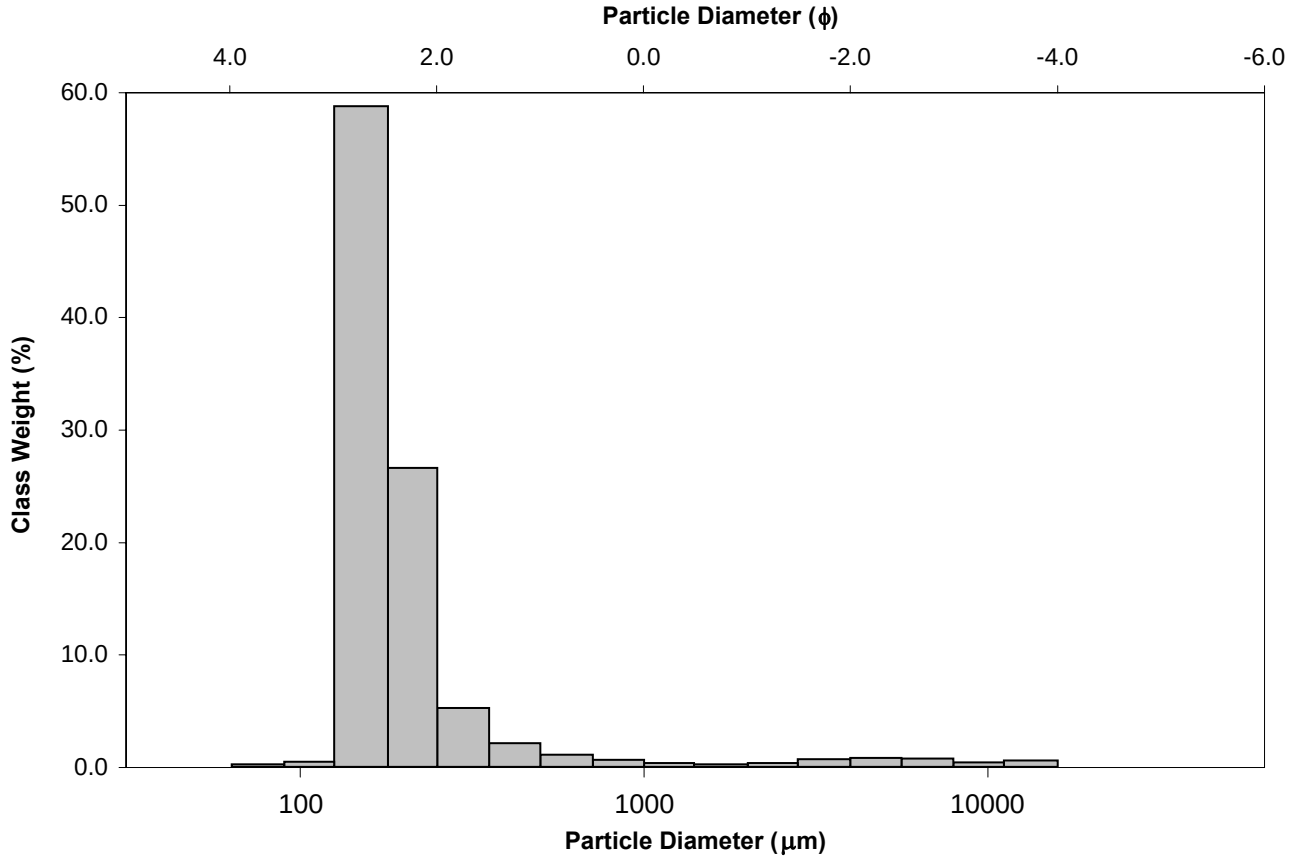
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.2	1.692
MEDIAN or D_{50}:	167.1	2.581
D_{90}:	309.4	2.930
(D_{90} / D_{10}):	2.358	1.731
(D_{90} - D_{10}):	178.2	1.238
(D_{75} / D_{25}):	1.485	1.256
(D_{75} - D_{25}):	69.74	0.571

GRAIN SIZE DISTRIBUTION

GRAVEL:	3.6%	COARSE SAND:	1.7%
SAND:	95.2%	MEDIUM SAND:	7.2%
MUD:	1.3%	FINE SAND:	84.9%
		V FINE SAND:	0.7%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	1.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	1.5%	FINE SILT:	0.2%
V FINE GRAVEL:	1.1%	V FINE SILT:	0.2%
V COARSE SAND:	0.6%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	431.2	196.8	2.345	176.2	2.504	Fine Sand
SORTING (σ):	1402.3	2.264	1.179	1.483	0.568	Moderately Well Sorted
SKEWNESS (Sk):	7.042	2.075	-2.075	0.475	-0.475	Very Coarse Skewed
KURTOSIS (K):	57.36	15.35	15.35	1.719	1.719	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_26**

ANALYST & DATE: Dan Gregory, 10/5/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

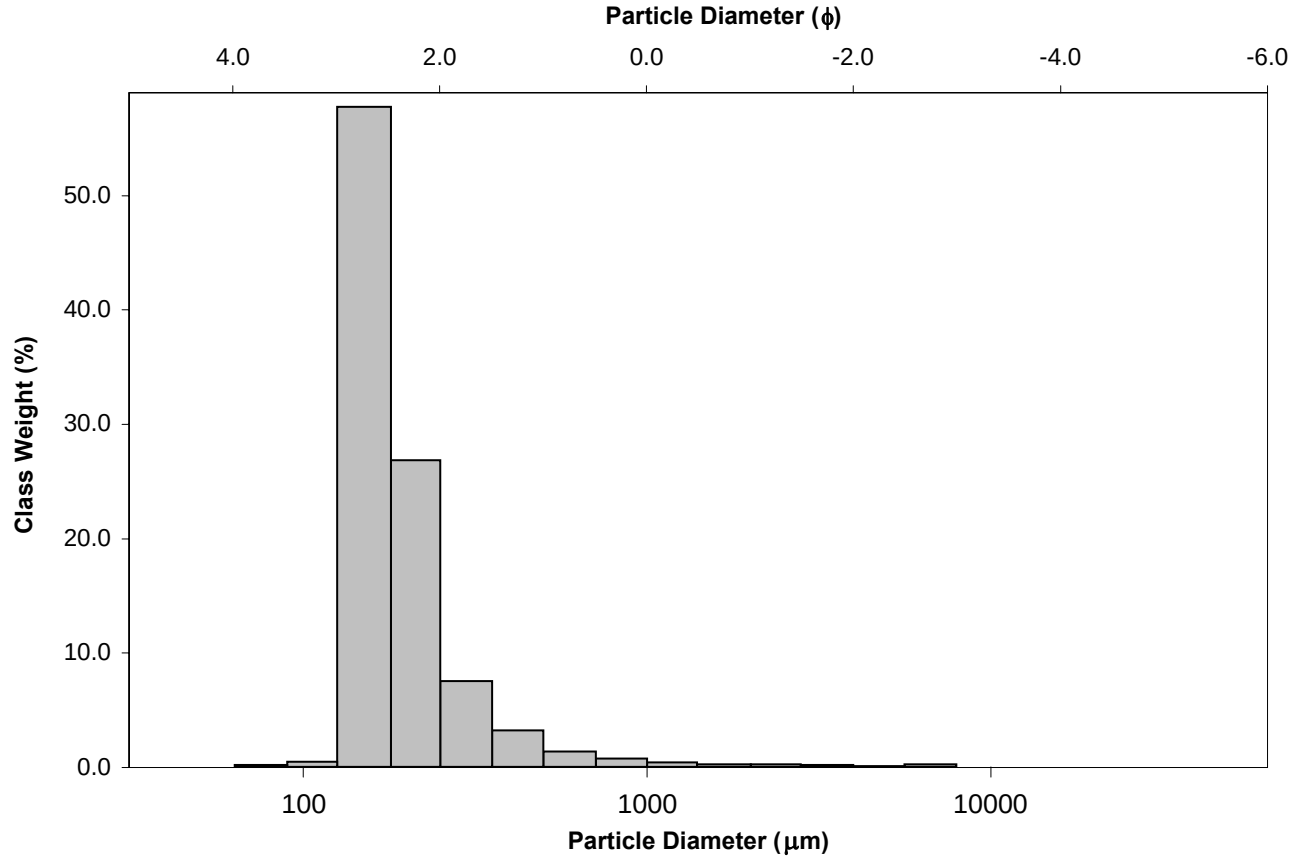
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.0	1.728
MEDIAN or D_{50}:	167.8	2.575
D_{90}:	301.8	2.933
(D_{90} / D_{10}):	2.305	1.697
(D_{90} - D_{10}):	170.9	1.205
(D_{75} / D_{25}):	1.502	1.265
(D_{75} - D_{25}):	72.12	0.587

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.8%	COARSE SAND:	2.1%
SAND:	97.4%	MEDIUM SAND:	10.4%
MUD:	1.8%	FINE SAND:	83.6%
		V FINE SAND:	0.7%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.3%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.3%
FINE GRAVEL:	0.3%	FINE SILT:	0.3%
V FINE GRAVEL:	0.5%	V FINE SILT:	0.3%
V COARSE SAND:	0.7%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	236.2	179.9	2.475	177.0	2.498	Fine Sand
SORTING (σ):	416.9	1.864	0.898	1.388	0.473	Well Sorted
SKEWNESS (Sk):	12.01	-0.824	0.824	0.407	-0.407	Very Coarse Skewed
KURTOSIS (K):	171.4	18.20	18.20	1.214	1.214	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_27**

ANALYST & DATE: Dan Gregory, 10/5/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

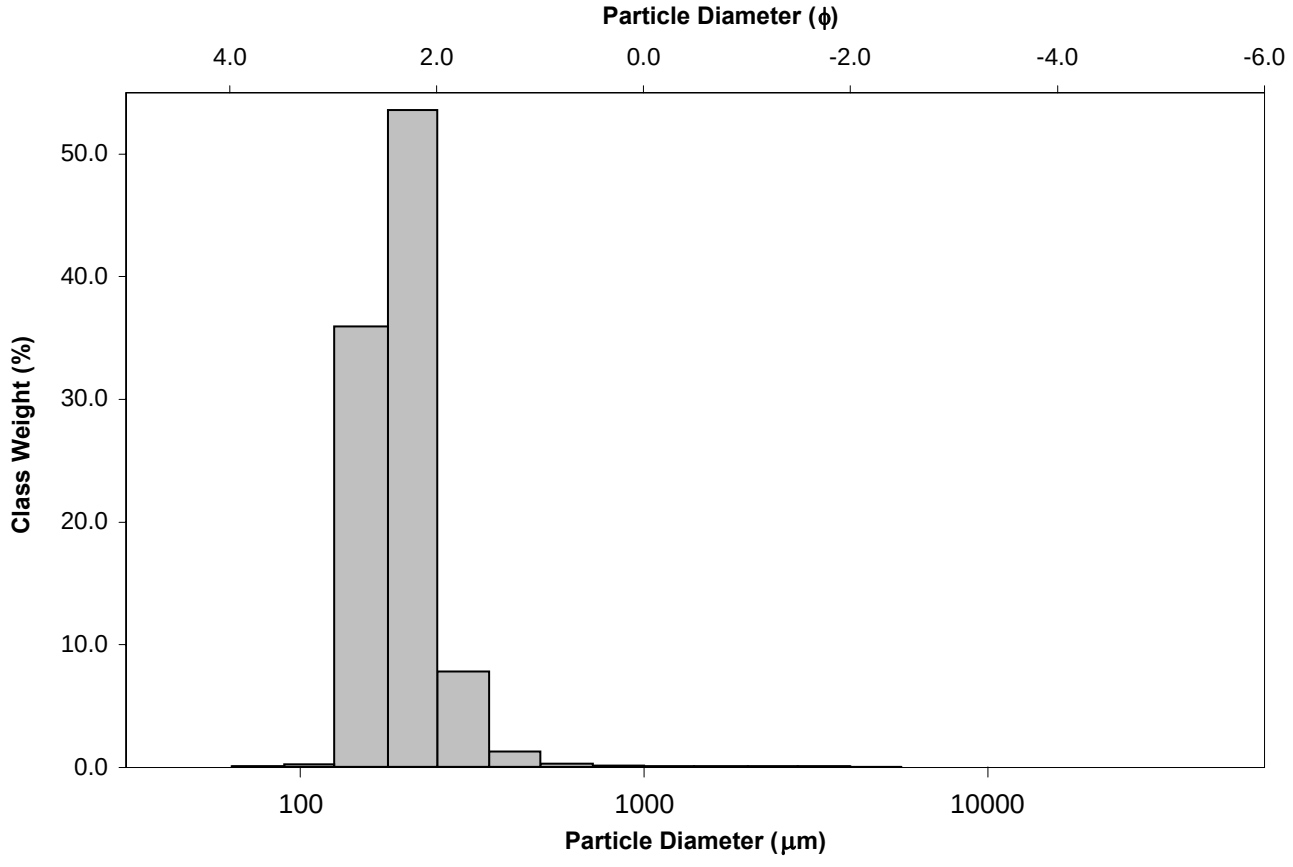
	μm	ϕ
MODE 1:	215.0	2.237
MODE 2:		
MODE 3:		
D_{10}:	135.7	2.001
MEDIAN or D_{50}:	192.9	2.374
D_{90}:	249.8	2.882
(D_{90} / D_{10}):	1.841	1.440
(D_{90} - D_{10}):	114.1	0.881
(D_{75} / D_{25}):	1.446	1.249
(D_{75} - D_{25}):	69.93	0.532

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	0.4%
SAND:	98.7%	MEDIUM SAND:	9.1%
MUD:	1.2%	FINE SAND:	88.6%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.0%	FINE SILT:	0.2%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.2%
V COARSE SAND:	0.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	207.5	187.4	2.416	188.2	2.410	Fine Sand
SORTING (σ):	152.5	1.558	0.639	1.299	0.377	Well Sorted
SKEWNESS (Sk):	17.42	-3.414	3.414	-0.028	0.028	Symmetrical
KURTOSIS (K):	399.8	34.51	34.51	0.974	0.974	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_28** ANALYST & DATE: Dan Gregory, 10/5/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

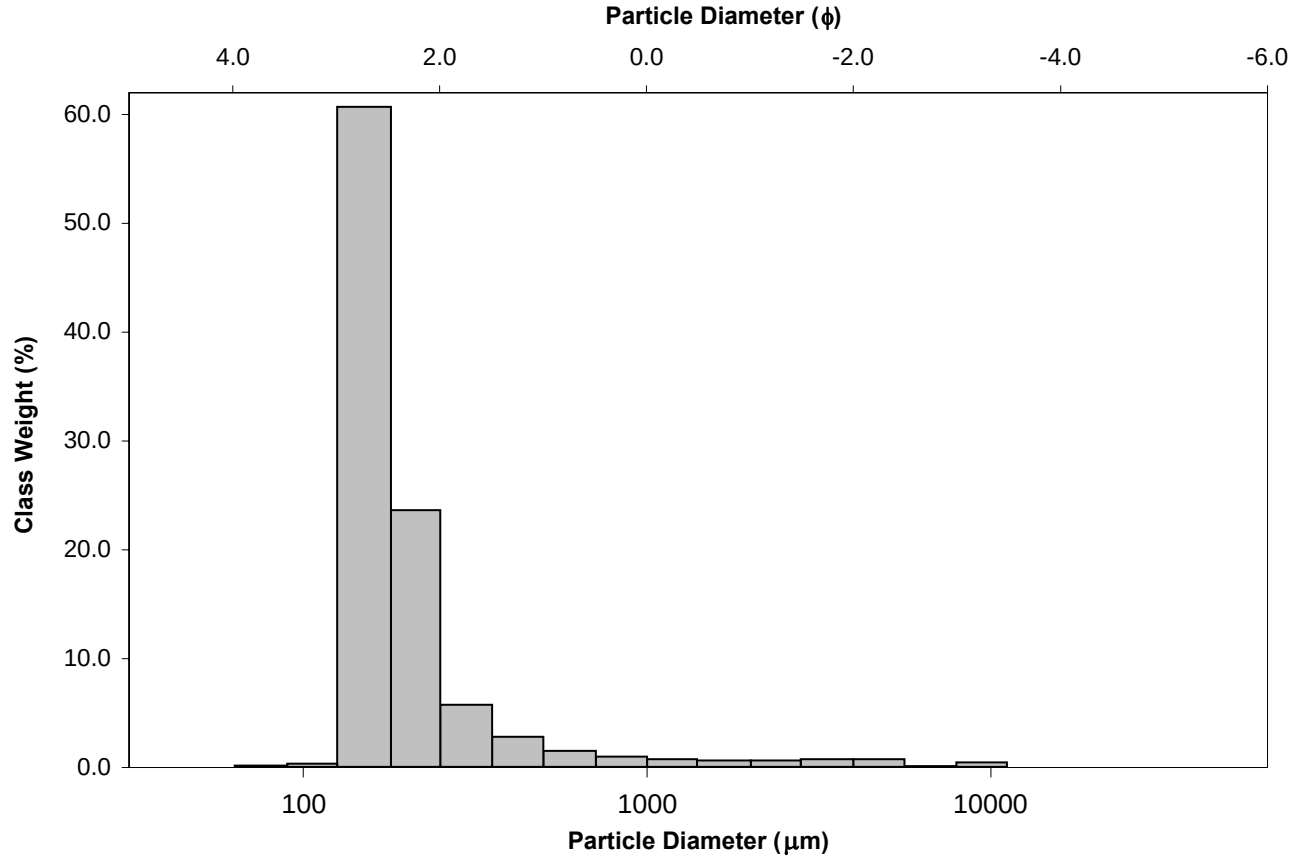
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.2	1.600
MEDIAN or D_{50}:	165.9	2.591
D_{90}:	329.9	2.930
(D_{90} / D_{10}):	2.515	1.832
(D_{90} - D_{10}):	198.7	1.331
(D_{75} / D_{25}):	1.487	1.257
(D_{75} - D_{25}):	69.83	0.573

GRAIN SIZE DISTRIBUTION

GRAVEL:	2.5%	COARSE SAND:	2.4%
SAND:	96.2%	MEDIUM SAND:	8.3%
MUD:	1.3%	FINE SAND:	83.8%
		V FINE SAND:	0.5%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.5%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.8%	FINE SILT:	0.2%
V FINE GRAVEL:	1.3%	V FINE SILT:	0.2%
V COARSE SAND:	1.3%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	326.9	192.3	2.379	176.6	2.502	Fine Sand
SORTING (σ):	842.1	2.083	1.059	1.483	0.569	Moderately Well Sorted
SKEWNESS (Sk):	8.058	1.328	-1.328	0.497	-0.497	Very Coarse Skewed
KURTOSIS (K):	77.64	14.82	14.82	1.688	1.688	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_29**

ANALYST & DATE: Dan Gregory, 10/5/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

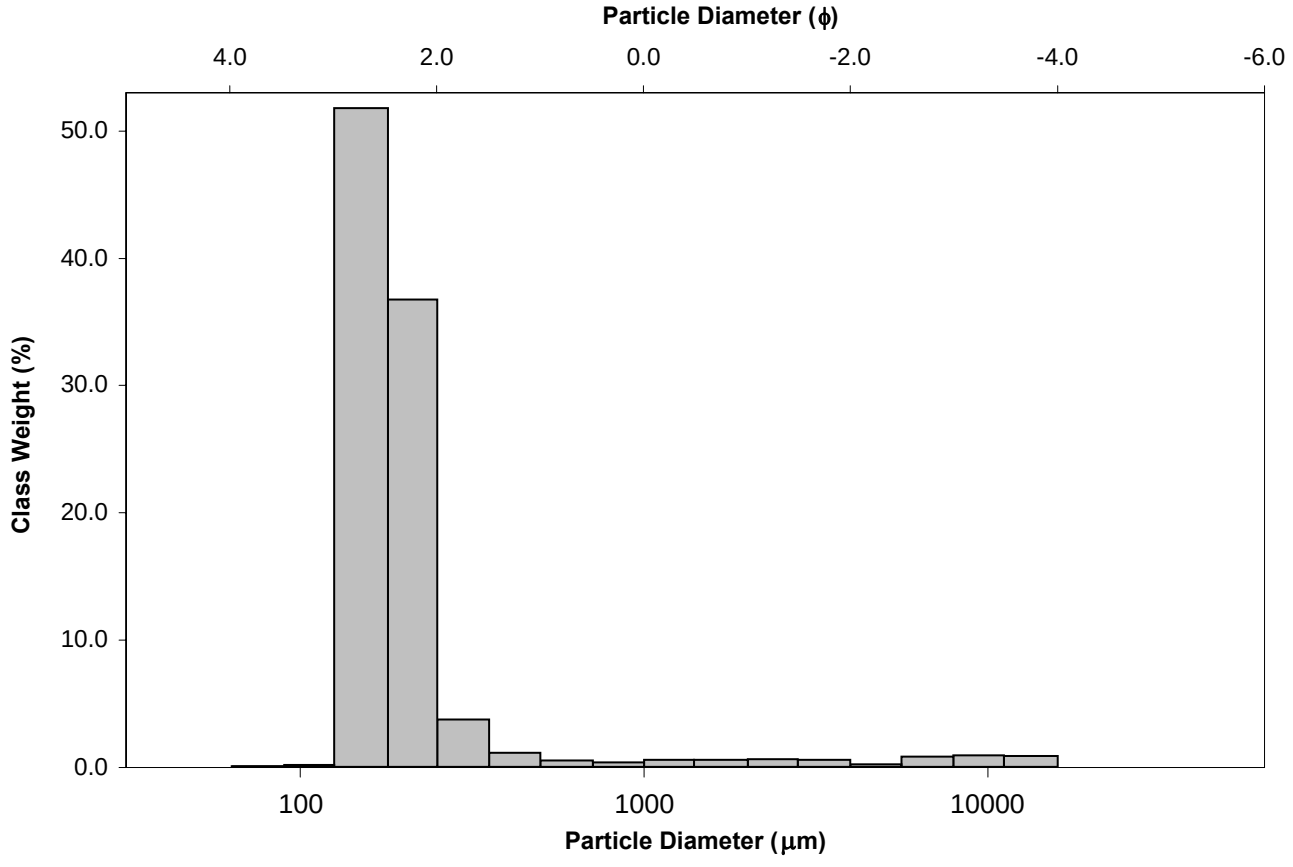
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	132.8	1.904
MEDIAN or D_{50}:	174.1	2.522
D_{90}:	267.1	2.913
(D_{90} / D_{10}):	2.012	1.530
(D_{90} - D_{10}):	134.4	1.009
(D_{75} / D_{25}):	1.484	1.259
(D_{75} - D_{25}):	71.13	0.569

GRAIN SIZE DISTRIBUTION

GRAVEL:	3.9%	COARSE SAND:	0.8%
SAND:	95.2%	MEDIUM SAND:	4.8%
MUD:	0.9%	FINE SAND:	88.2%
		V FINE SAND:	0.2%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.1%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.1%
MEDIUM GRAVEL:	1.8%	MEDIUM SILT:	0.1%
FINE GRAVEL:	1.0%	FINE SILT:	0.1%
V FINE GRAVEL:	1.1%	V FINE SILT:	0.1%
V COARSE SAND:	1.1%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	500.6	205.7	2.282	178.9	2.483	Fine Sand
SORTING (σ):	1678.9	2.305	1.205	1.571	0.651	Moderately Well Sorted
SKEWNESS (Sk):	6.184	2.663	-2.663	0.428	-0.428	Very Coarse Skewed
KURTOSIS (K):	42.72	15.99	15.99	2.166	2.166	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_30**

ANALYST & DATE: Dan Gregory, 10/5/2012

SAMPLE TYPE: Trimodal, Very Poorly Sorted

TEXTURAL GROUP: Sandy Gravel

SEDIMENT NAME: Sandy Coarse Gravel

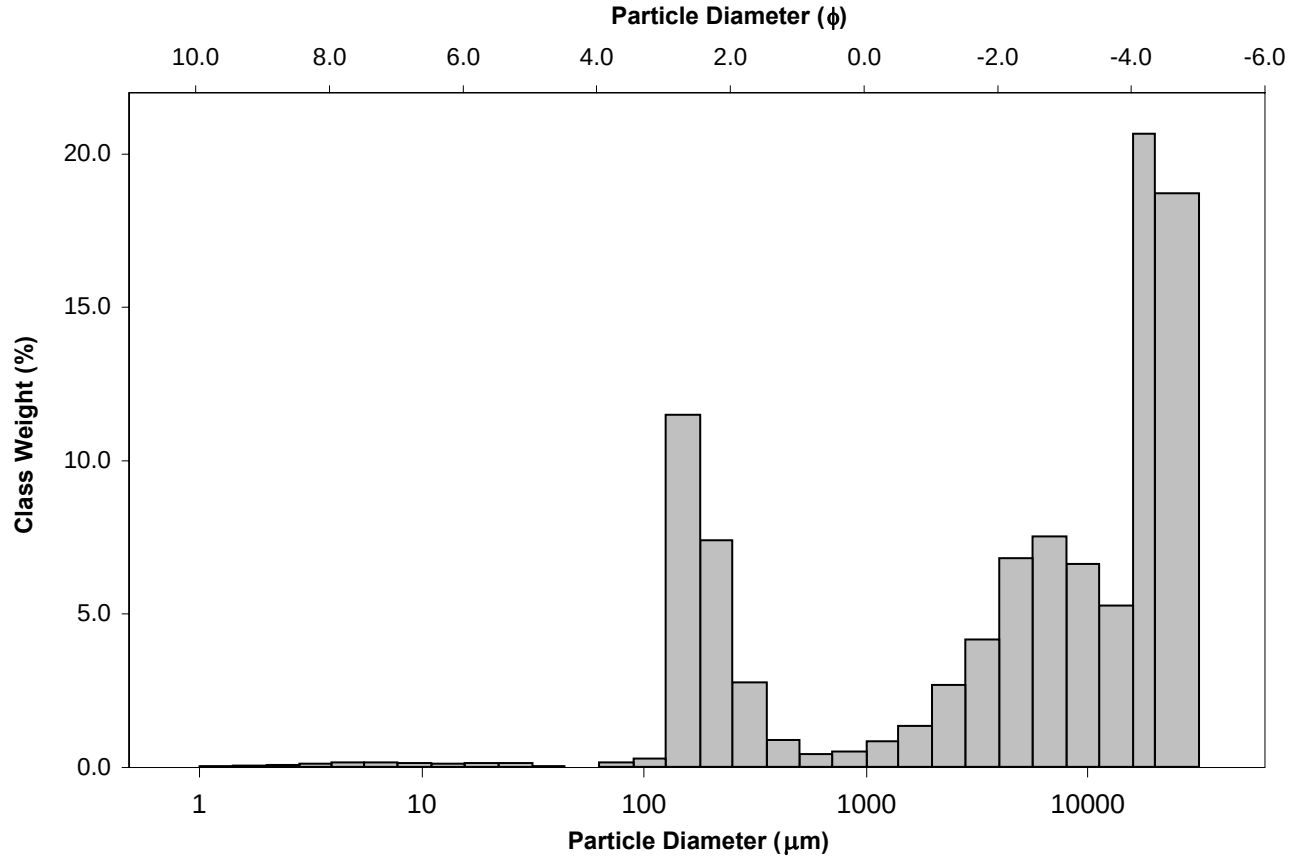
	μm	ϕ
MODE 1:	18000.0	-4.161
MODE 2:	152.5	2.737
MODE 3:	6800.0	-2.743
D_{10}:	160.5	-4.714
MEDIAN or D_{50}:	8211.8	-3.038
D_{90}:	26254.1	2.639
(D_{90} / D_{10}):	163.6	-0.560
(D_{90} - D_{10}):	26093.6	7.354
(D_{75} / D_{25}):	31.89	-0.156
(D_{75} - D_{25}):	19352.6	4.995

GRAIN SIZE DISTRIBUTION

GRAVEL:	72.1%	COARSE SAND:	1.0%
SAND:	26.7%	MEDIUM SAND:	3.7%
MUD:	1.1%	FINE SAND:	19.4%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	38.5%	COARSE SILT:	0.3%
MEDIUM GRAVEL:	12.1%	MEDIUM SILT:	0.3%
FINE GRAVEL:	14.6%	FINE SILT:	0.3%
V FINE GRAVEL:	7.0%	V FINE SILT:	0.2%
V COARSE SAND:	2.2%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	11389.5	3925.0	-1.973	3373.2	-1.754	Very Fine Gravel
SORTING (σ):	10077.5	7.473	2.902	7.406	2.889	Very Poorly Sorted
SKEWNESS (Sk):	0.322	-0.936	0.936	-0.545	0.545	Very Fine Skewed
KURTOSIS (K):	1.513	2.717	2.717	0.632	0.632	Very Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_32** ANALYST & DATE: Dan Gregory, 10/5/2012

SAMPLE TYPE: Unimodal, Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

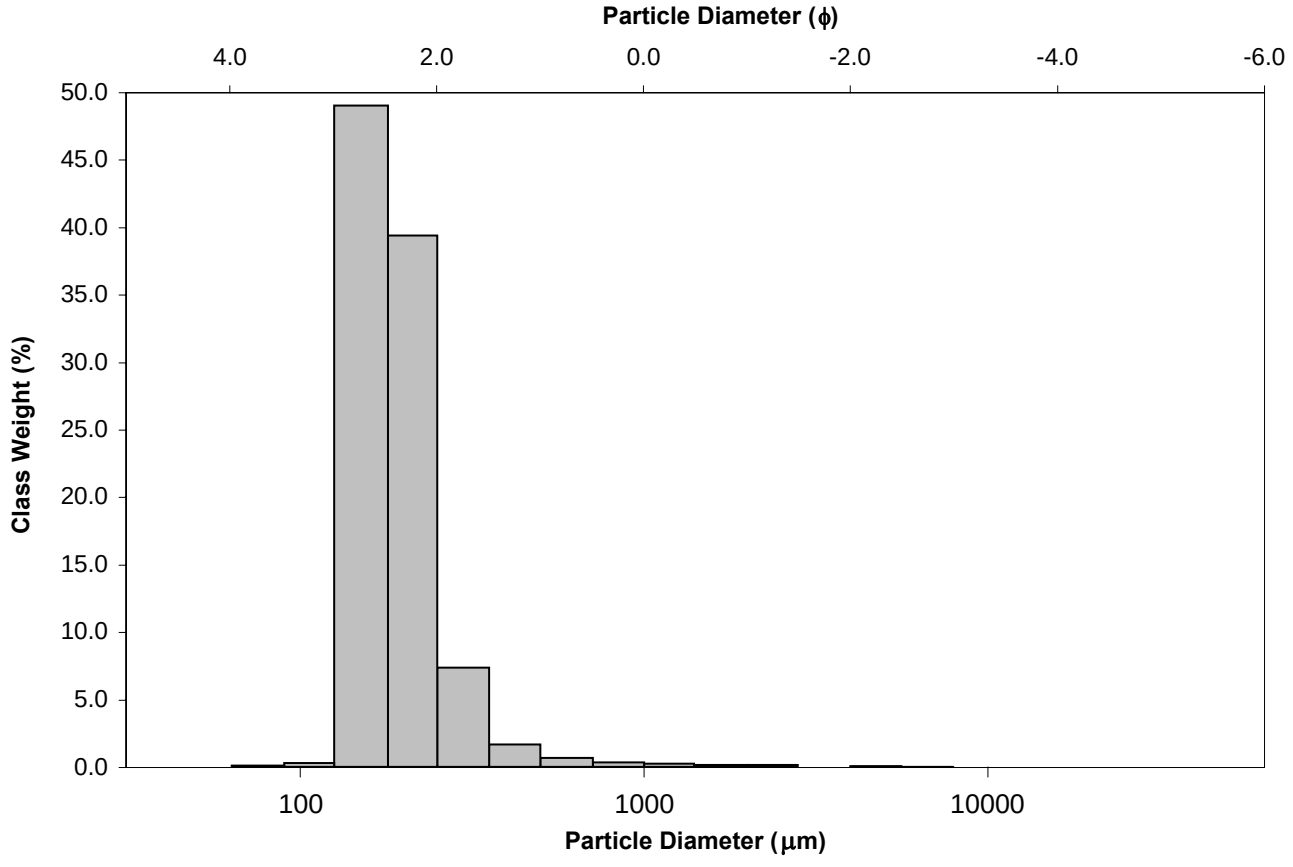
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	132.8	1.950
MEDIAN or D_{50}:	176.9	2.499
D_{90}:	258.8	2.912
(D_{90} / D_{10}):	1.948	1.493
(D_{90} - D_{10}):	125.9	0.962
(D_{75} / D_{25}):	1.488	1.263
(D_{75} - D_{25}):	72.23	0.574

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.3%	COARSE SAND:	1.0%
SAND:	98.6%	MEDIUM SAND:	9.0%
MUD:	1.1%	FINE SAND:	87.8%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.1%	FINE SILT:	0.2%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.2%
V COARSE SAND:	0.5%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	209.9	182.1	2.458	180.2	2.473	Fine Sand
SORTING (σ):	222.3	1.614	0.691	1.321	0.401	Well Sorted
SKEWNESS (Sk):	17.04	-1.876	1.876	0.209	-0.209	Coarse Skewed
KURTOSIS (K):	397.8	27.24	27.24	0.970	0.970	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_33**

ANALYST & DATE: Dan Gregory, 10/5/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

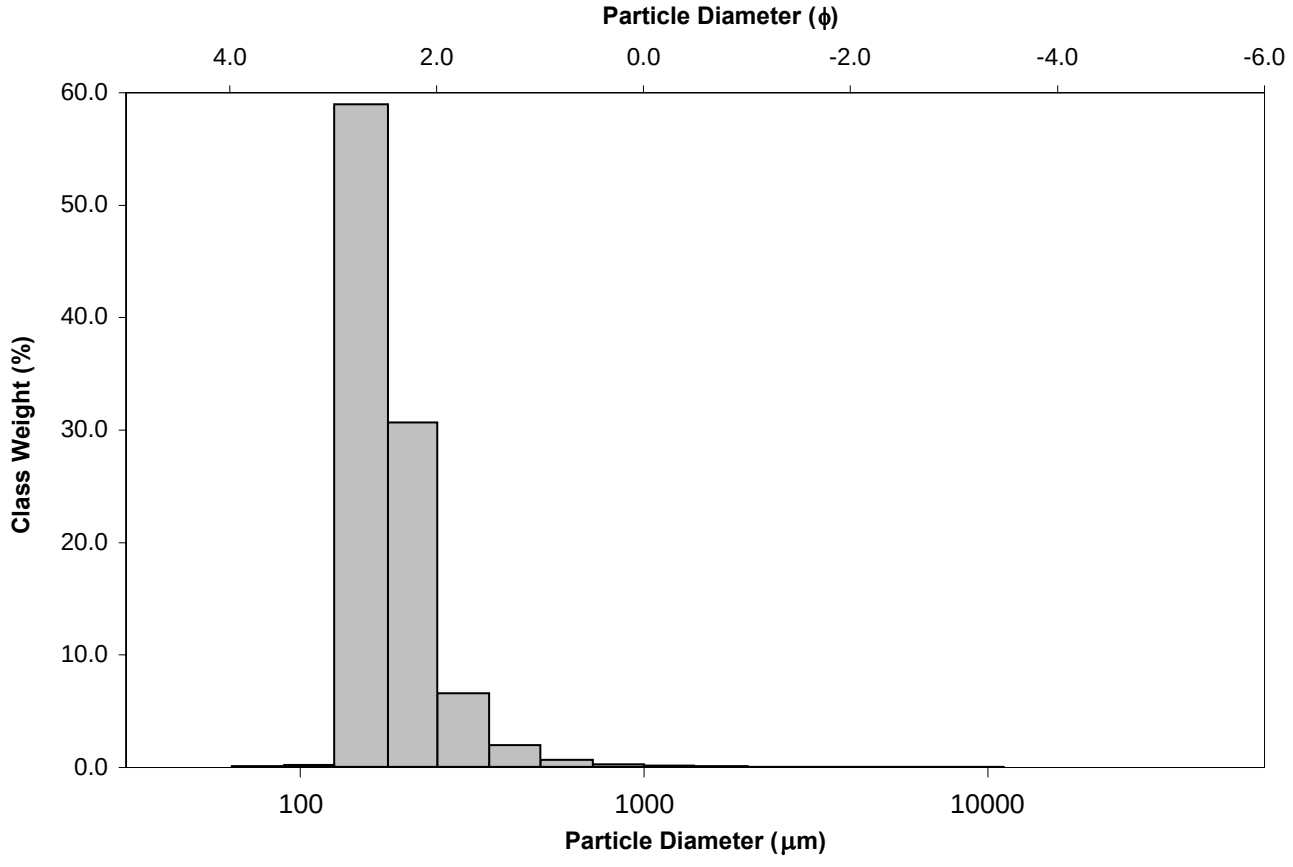
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.5	2.008
MEDIAN or D_{50}:	167.3	2.579
D_{90}:	248.7	2.927
(D_{90} / D_{10}):	1.891	1.458
(D_{90} - D_{10}):	117.2	0.919
(D_{75} / D_{25}):	1.452	1.238
(D_{75} - D_{25}):	65.04	0.538

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	0.9%
SAND:	98.5%	MEDIUM SAND:	8.3%
MUD:	1.3%	FINE SAND:	88.8%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.1%	FINE SILT:	0.2%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.2%
V COARSE SAND:	0.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	199.7	173.2	2.530	174.2	2.521	Fine Sand
SORTING (σ):	269.5	1.617	0.693	1.313	0.393	Well Sorted
SKEWNESS (Sk):	25.39	-2.396	2.396	0.320	-0.320	Very Coarse Skewed
KURTOSIS (K):	772.6	29.34	29.34	1.010	1.010	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_34**

ANALYST & DATE: Dan Gregory, 10/5/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

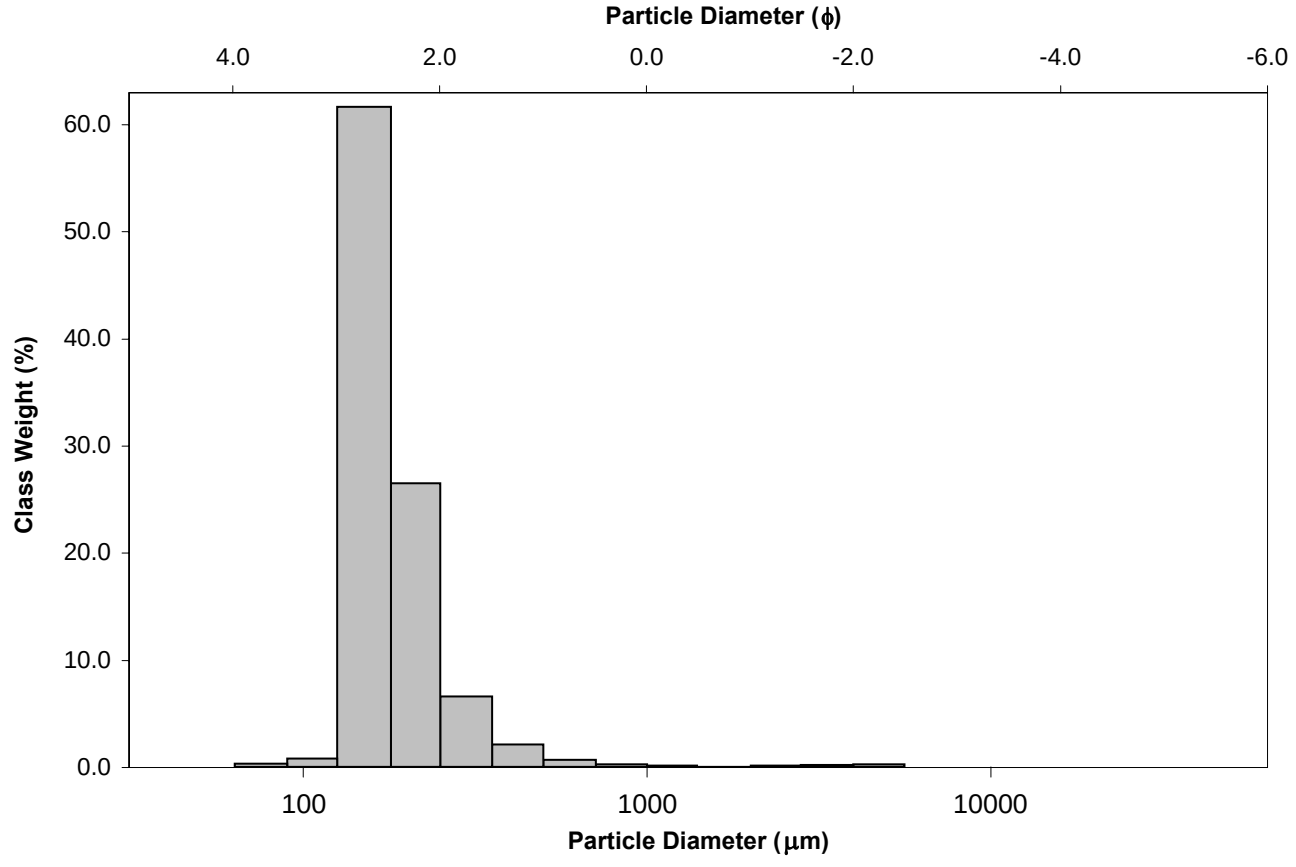
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.4	1.992
MEDIAN or D_{50}:	164.5	2.604
D_{90}:	251.3	2.938
(D_{90} / D_{10}):	1.927	1.475
(D_{90} - D_{10}):	120.9	0.946
(D_{75} / D_{25}):	1.437	1.228
(D_{75} - D_{25}):	62.17	0.523

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.6%	COARSE SAND:	0.9%
SAND:	97.8%	MEDIUM SAND:	8.4%
MUD:	1.6%	FINE SAND:	87.3%
		V FINE SAND:	1.0%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.3%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.3%
FINE GRAVEL:	0.2%	FINE SILT:	0.3%
V FINE GRAVEL:	0.3%	V FINE SILT:	0.3%
V COARSE SAND:	0.2%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	208.6	171.4	2.545	172.5	2.536	Fine Sand
SORTING (σ):	297.0	1.718	0.781	1.322	0.403	Well Sorted
SKEWNESS (Sk):	12.36	-1.495	1.495	0.360	-0.360	Very Coarse Skewed
KURTOSIS (K):	172.7	23.97	23.97	1.082	1.082	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_35**

ANALYST & DATE: Dan Gregory, 10/5/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

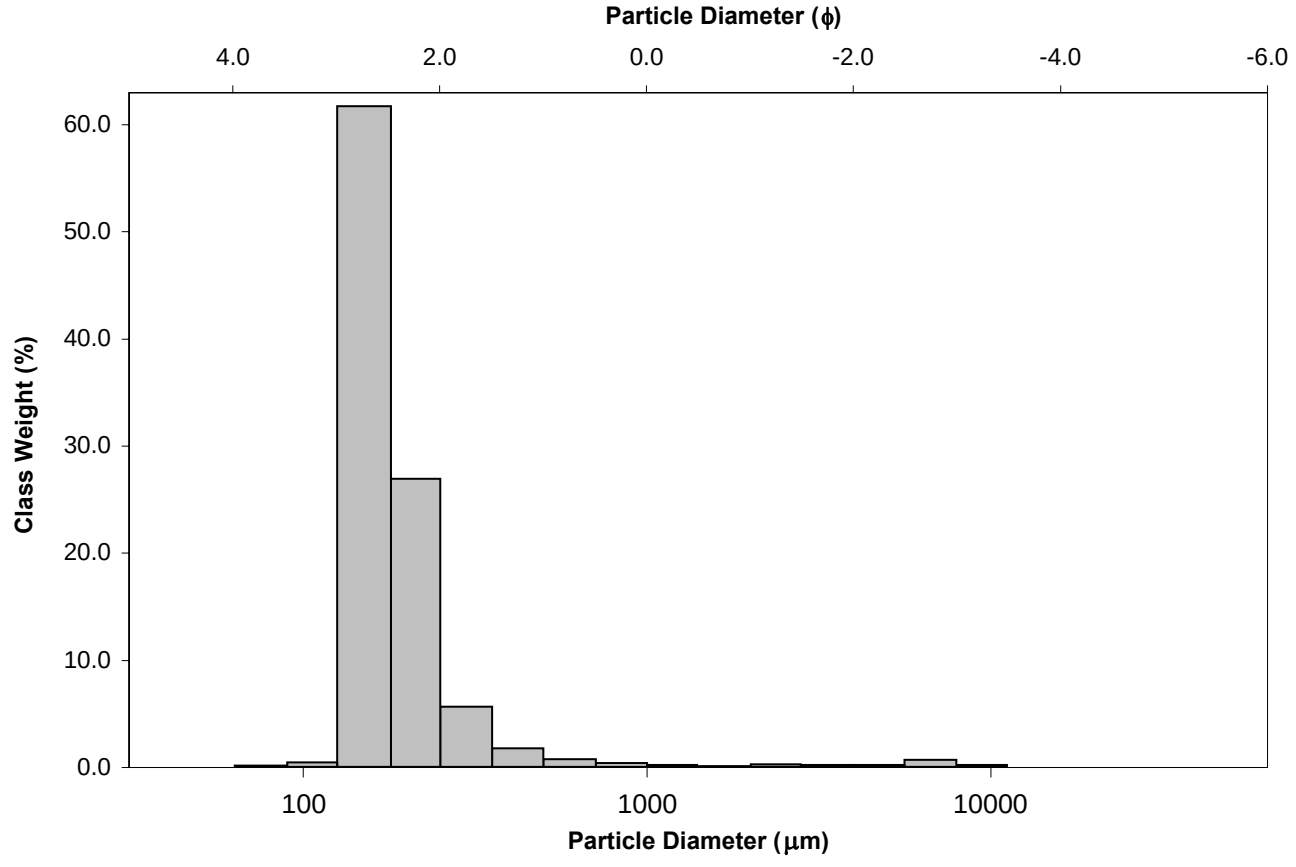
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.9	1.991
MEDIAN or D_{50}:	165.0	2.599
D_{90}:	251.6	2.933
(D_{90} / D_{10}):	1.921	1.473
(D_{90} - D_{10}):	120.7	0.942
(D_{75} / D_{25}):	1.438	1.229
(D_{75} - D_{25}):	62.49	0.524

GRAIN SIZE DISTRIBUTION

GRAVEL:	1.6%	COARSE SAND:	1.1%
SAND:	97.0%	MEDIUM SAND:	7.1%
MUD:	1.4%	FINE SAND:	87.9%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.2%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.9%	FINE SILT:	0.2%
V FINE GRAVEL:	0.5%	V FINE SILT:	0.2%
V COARSE SAND:	0.3%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	275.9	178.9	2.483	172.9	2.532	Fine Sand
SORTING (σ):	753.2	1.884	0.913	1.330	0.411	Well Sorted
SKEWNESS (Sk):	9.180	1.079	-1.079	0.372	-0.372	Very Coarse Skewed
KURTOSIS (K):	93.10	22.48	22.48	1.130	1.130	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_36**

ANALYST & DATE: michelle.grey, 10/5/2012

SAMPLE TYPE: Unimodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Fine Gravelly Fine Sand

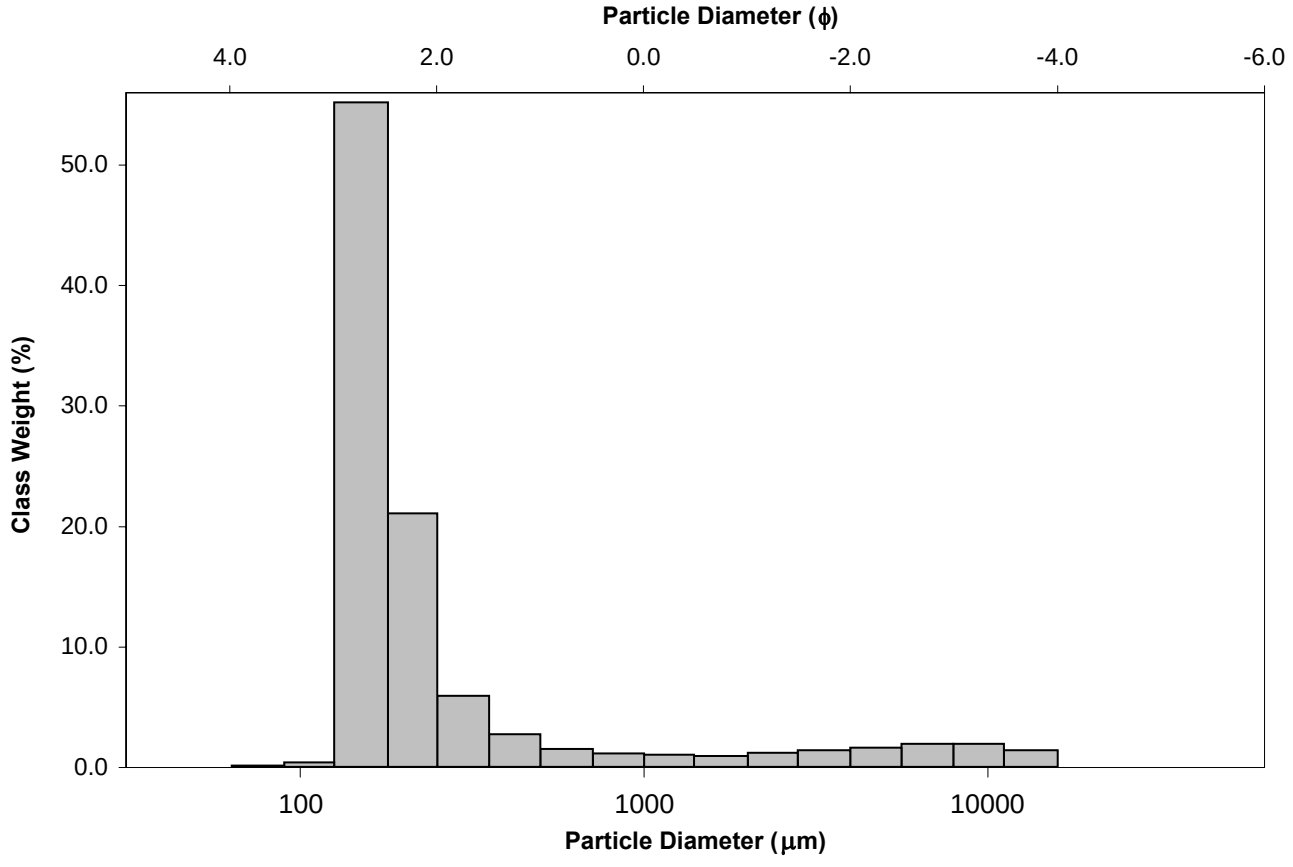
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.6	-0.608
MEDIAN or D_{50}:	170.5	2.552
D_{90}:	1524.6	2.925
(D_{90} / D_{10}):	11.58	-4.807
(D_{90} - D_{10}):	1393.0	3.534
(D_{75} / D_{25}):	1.642	1.346
(D_{75} - D_{25}):	93.16	0.716

GRAIN SIZE DISTRIBUTION

GRAVEL:	9.3%	COARSE SAND:	2.5%
SAND:	89.2%	MEDIUM SAND:	8.4%
MUD:	1.5%	FINE SAND:	75.9%
		V FINE SAND:	0.5%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	3.2%	MEDIUM SILT:	0.2%
FINE GRAVEL:	3.5%	FINE SILT:	0.2%
V FINE GRAVEL:	2.6%	V FINE SILT:	0.2%
V COARSE SAND:	1.9%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	853.7	250.2	1.999	205.1	2.285	Fine Sand
SORTING (σ):	2271.0	3.250	1.700	2.287	1.193	Poorly Sorted
SKEWNESS (Sk):	3.992	1.634	-1.634	0.703	-0.703	Very Coarse Skewed
KURTOSIS (K):	19.24	6.978	6.978	3.154	3.154	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_37**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Medium Gravelly Fine Sand

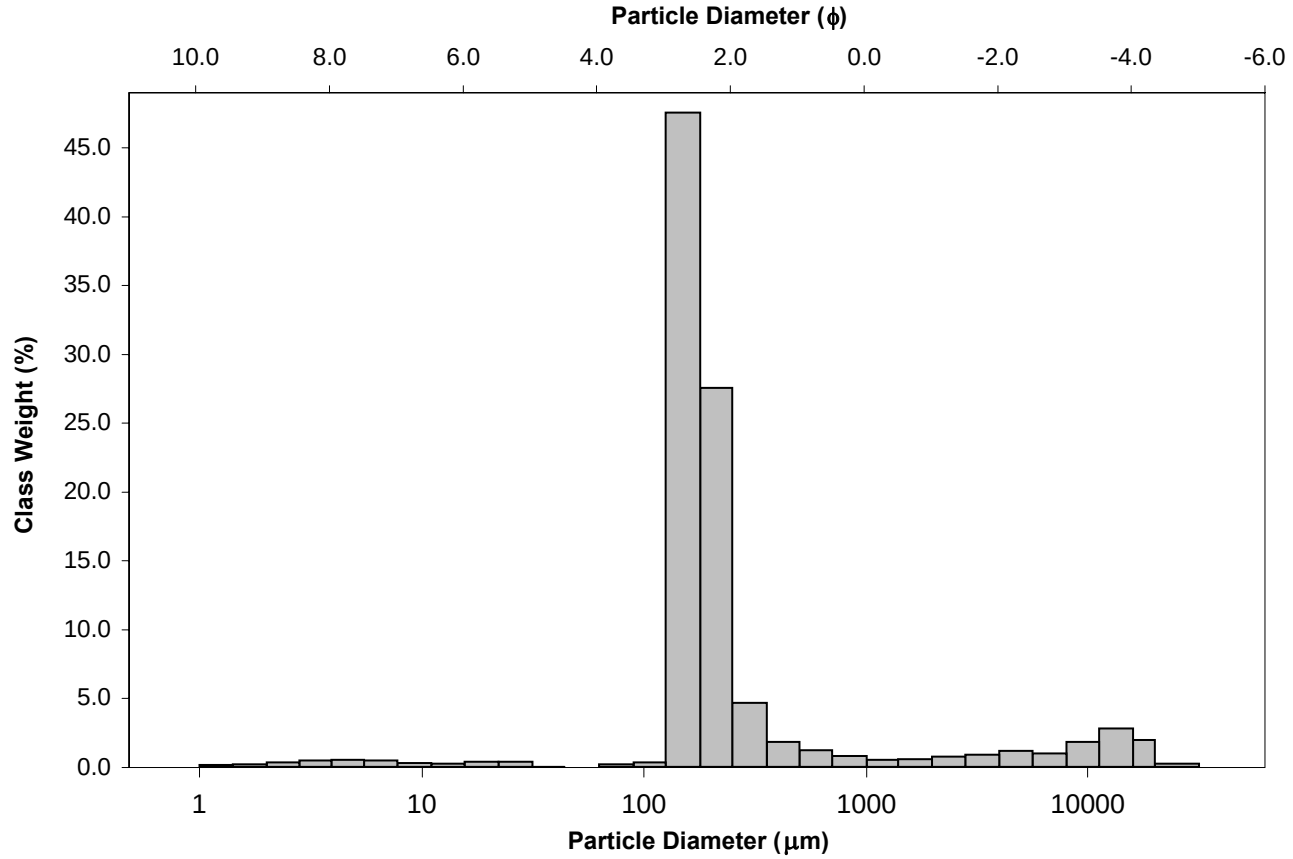
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.3	-1.073
MEDIAN or D_{50}:	174.6	2.518
D_{90}:	2103.5	2.940
(D_{90} / D_{10}):	16.14	-2.740
(D_{90} - D_{10}):	1973.2	4.013
(D_{75} / D_{25}):	1.609	1.328
(D_{75} - D_{25}):	88.58	0.686

GRAIN SIZE DISTRIBUTION

GRAVEL:	10.1%	COARSE SAND:	2.0%
SAND:	86.1%	MEDIUM SAND:	6.5%
MUD:	3.7%	FINE SAND:	75.9%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	1.6%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	4.7%	MEDIUM SILT:	0.6%
FINE GRAVEL:	2.2%	FINE SILT:	1.0%
V FINE GRAVEL:	1.7%	V FINE SILT:	0.8%
V COARSE SAND:	1.1%	CLAY:	0.5%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	1234.7	242.9	2.041	198.7	2.331	Fine Sand
SORTING (σ):	3558.7	4.199	2.070	2.428	1.280	Poorly Sorted
SKEWNESS (Sk):	3.853	0.928	-0.928	0.645	-0.645	Very Coarse Skewed
KURTOSIS (K):	18.33	6.940	6.940	3.785	3.785	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_38**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

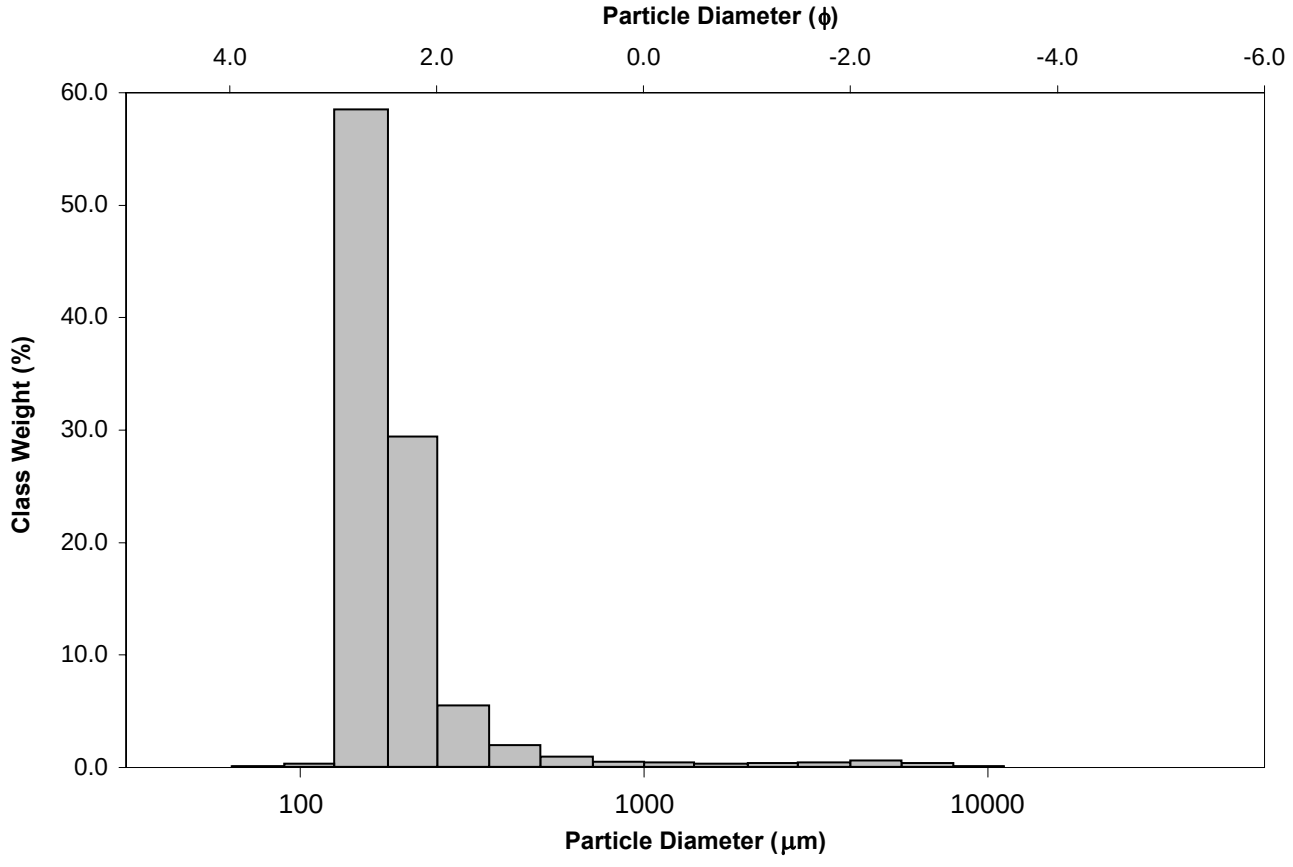
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.2	1.905
MEDIAN or D_{50}:	167.4	2.578
D_{90}:	267.0	2.930
(D_{90} / D_{10}):	2.035	1.538
(D_{90} - D_{10}):	135.8	1.025
(D_{75} / D_{25}):	1.468	1.247
(D_{75} - D_{25}):	67.26	0.554

GRAIN SIZE DISTRIBUTION

GRAVEL:	1.7%	COARSE SAND:	1.4%
SAND:	96.7%	MEDIUM SAND:	7.3%
MUD:	1.6%	FINE SAND:	86.9%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.3%
MEDIUM GRAVEL:	0.1%	MEDIUM SILT:	0.3%
FINE GRAVEL:	0.9%	FINE SILT:	0.3%
V FINE GRAVEL:	0.7%	V FINE SILT:	0.3%
V COARSE SAND:	0.7%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	272.7	181.8	2.459	175.0	2.514	Fine Sand
SORTING (σ):	636.2	1.945	0.959	1.363	0.446	Well Sorted
SKEWNESS (Sk):	8.835	0.496	-0.496	0.381	-0.381	Very Coarse Skewed
KURTOSIS (K):	91.66	18.44	18.44	1.216	1.216	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_39**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

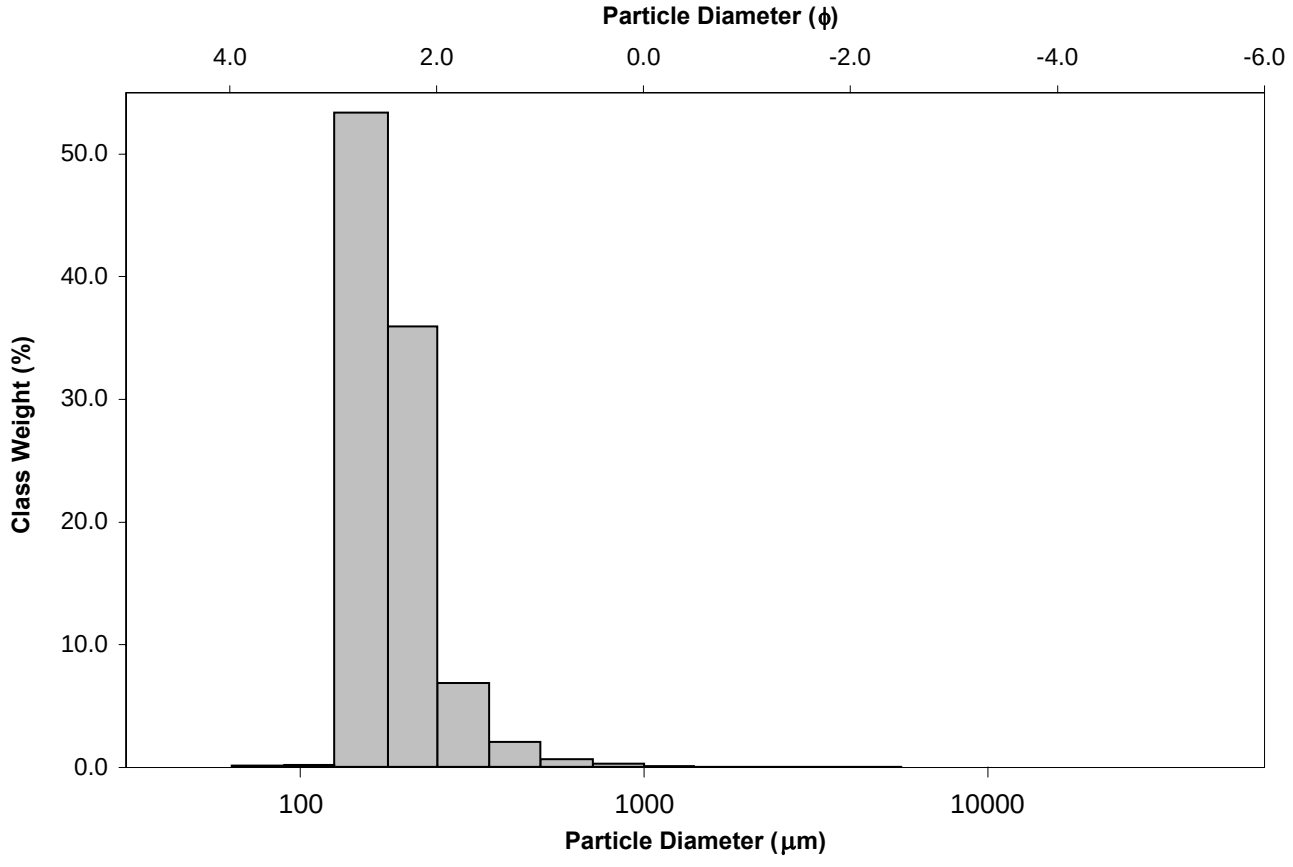
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	132.2	2.001
MEDIAN or D_{50}:	172.3	2.537
D_{90}:	249.8	2.919
(D_{90} / D_{10}):	1.889	1.459
(D_{90} - D_{10}):	117.6	0.918
(D_{75} / D_{25}):	1.476	1.254
(D_{75} - D_{25}):	69.55	0.562

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.9%
SAND:	98.7%	MEDIUM SAND:	8.8%
MUD:	1.2%	FINE SAND:	88.6%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.0%	FINE SILT:	0.2%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.2%
V COARSE SAND:	0.1%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	197.4	176.9	2.499	177.4	2.495	Fine Sand
SORTING (σ):	145.1	1.581	0.661	1.316	0.396	Well Sorted
SKEWNESS (Sk):	18.72	-2.983	2.983	0.259	-0.259	Coarse Skewed
KURTOSIS (K):	503.9	29.70	29.70	0.972	0.972	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_40**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

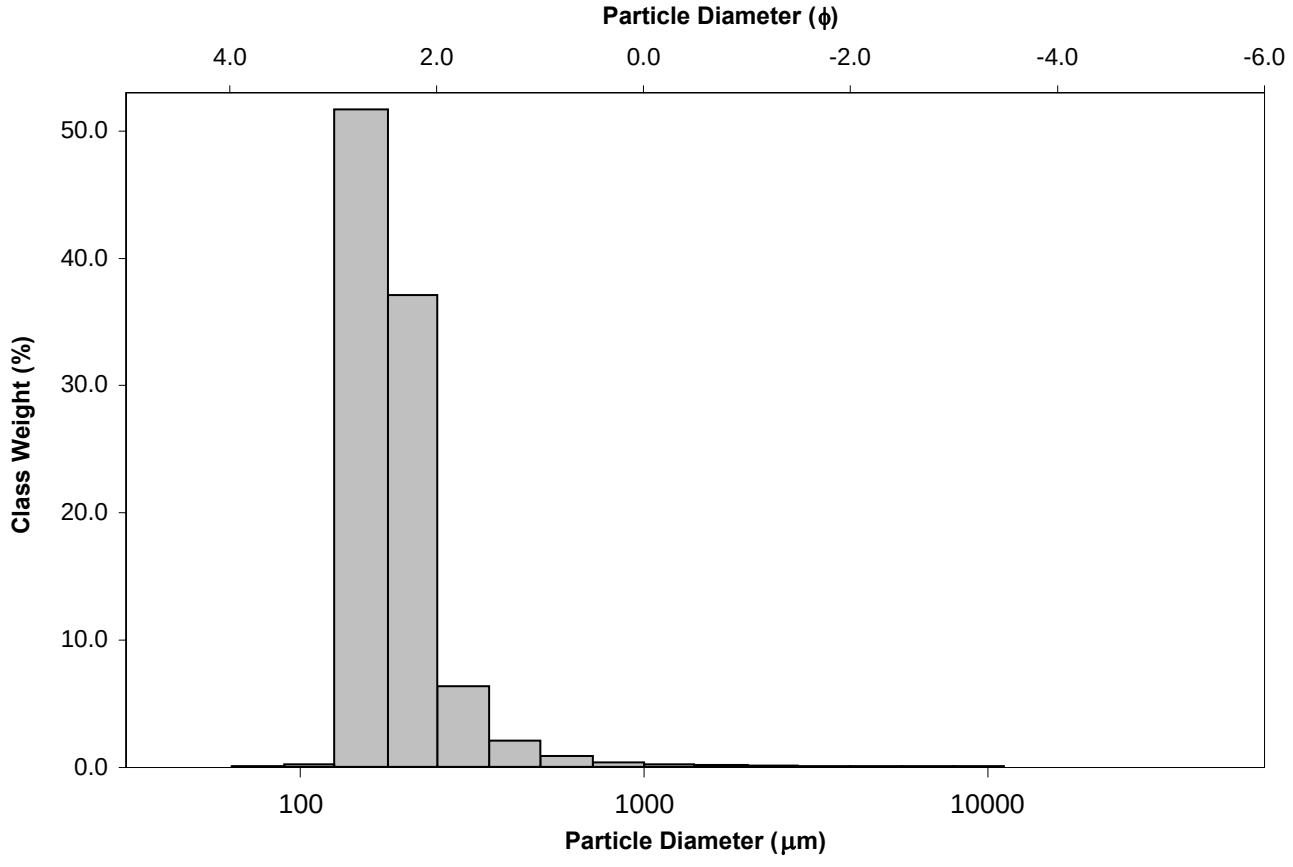
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	132.3	1.963
MEDIAN or D_{50}:	173.9	2.523
D_{90}:	256.6	2.918
(D_{90} / D_{10}):	1.939	1.487
(D_{90} - D_{10}):	124.2	0.955
(D_{75} / D_{25}):	1.485	1.259
(D_{75} - D_{25}):	71.08	0.570

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.4%	COARSE SAND:	1.2%
SAND:	98.2%	MEDIUM SAND:	8.4%
MUD:	1.3%	FINE SAND:	87.9%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.1%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.1%	FINE SILT:	0.2%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.2%
V COARSE SAND:	0.4%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	219.1	180.4	2.470	178.5	2.486	Fine Sand
SORTING (σ):	364.9	1.686	0.754	1.327	0.408	Well Sorted
SKEWNESS (Sk):	18.26	-1.342	1.342	0.256	-0.256	Coarse Skewed
KURTOSIS (K):	401.9	25.67	25.67	1.008	1.008	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_41**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

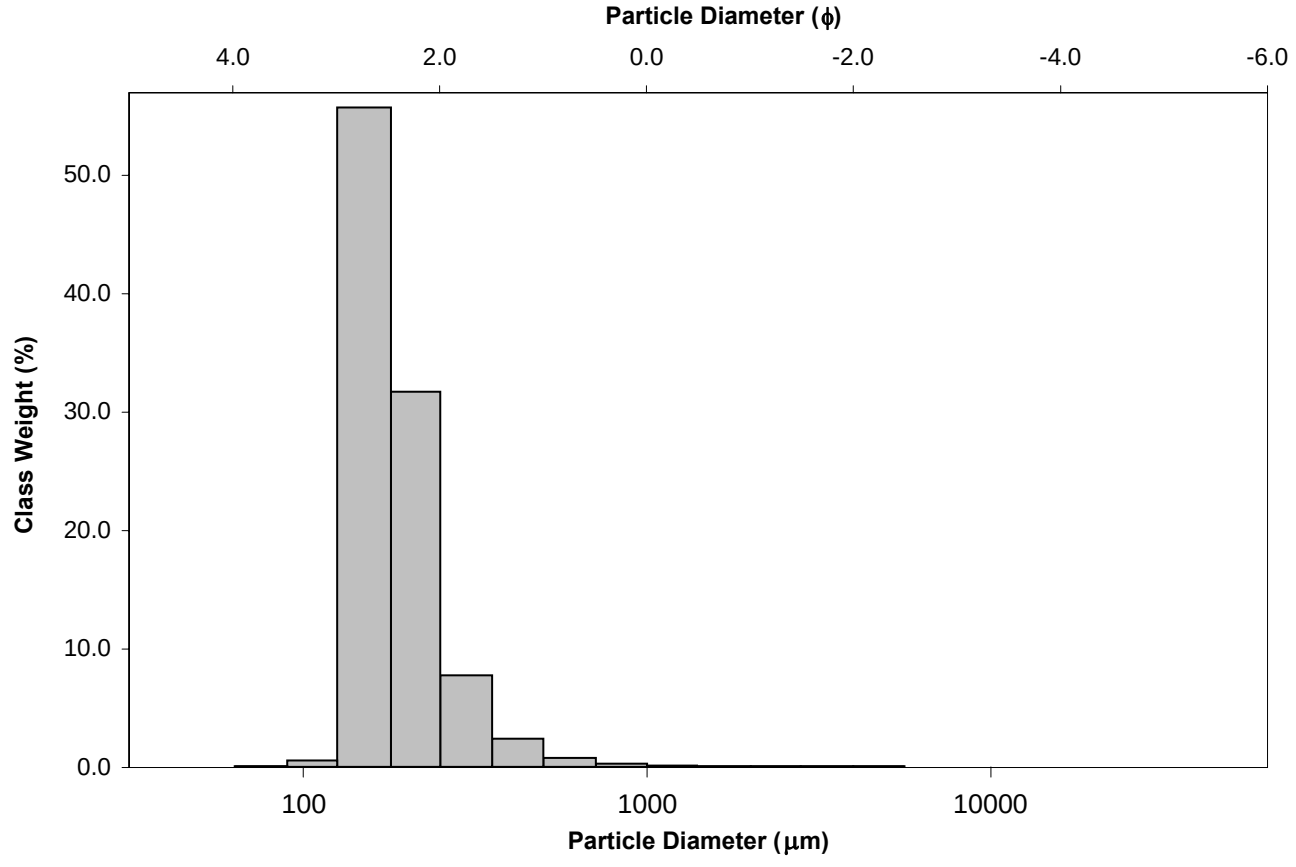
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.8	1.908
MEDIAN or D_{50}:	169.9	2.557
D_{90}:	266.4	2.923
(D_{90} / D_{10}):	2.021	1.532
(D_{90} - D_{10}):	134.6	1.015
(D_{75} / D_{25}):	1.482	1.256
(D_{75} - D_{25}):	69.87	0.568

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	1.0%
SAND:	98.8%	MEDIUM SAND:	10.0%
MUD:	1.0%	FINE SAND:	87.0%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.1%	FINE SILT:	0.2%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.2%
V COARSE SAND:	0.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	200.2	177.8	2.492	176.8	2.500	Fine Sand
SORTING (σ):	167.7	1.572	0.653	1.328	0.409	Well Sorted
SKEWNESS (Sk):	17.14	-2.278	2.278	0.312	-0.312	Very Coarse Skewed
KURTOSIS (K):	401.1	28.29	28.29	1.003	1.003	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_42**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

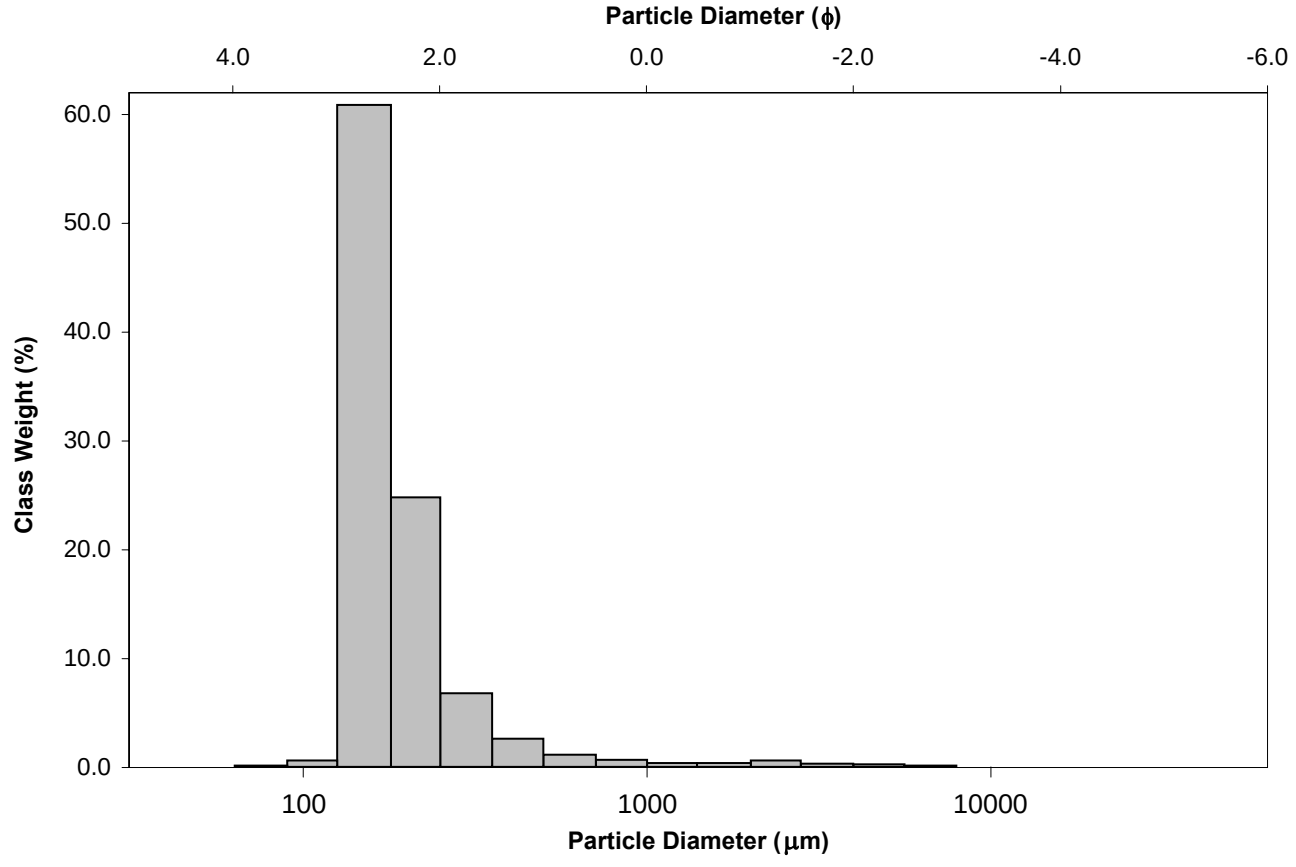
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.8	1.782
MEDIAN or D_{50}:	165.4	2.596
D_{90}:	290.8	2.935
(D_{90} / D_{10}):	2.224	1.647
(D_{90} - D_{10}):	160.1	1.153
(D_{75} / D_{25}):	1.469	1.246
(D_{75} - D_{25}):	66.97	0.555

GRAIN SIZE DISTRIBUTION

GRAVEL:	1.3%	COARSE SAND:	1.7%
SAND:	97.1%	MEDIUM SAND:	9.1%
MUD:	1.6%	FINE SAND:	84.8%
		V FINE SAND:	0.7%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.3%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.3%
FINE GRAVEL:	0.4%	FINE SILT:	0.3%
V FINE GRAVEL:	0.9%	V FINE SILT:	0.3%
V COARSE SAND:	0.8%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	244.7	179.8	2.475	174.9	2.515	Fine Sand
SORTING (σ):	443.7	1.877	0.908	1.382	0.466	Well Sorted
SKEWNESS (Sk):	9.564	-0.147	0.147	0.427	-0.427	Very Coarse Skewed
KURTOSIS (K):	112.0	17.82	17.82	1.276	1.276	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_43**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

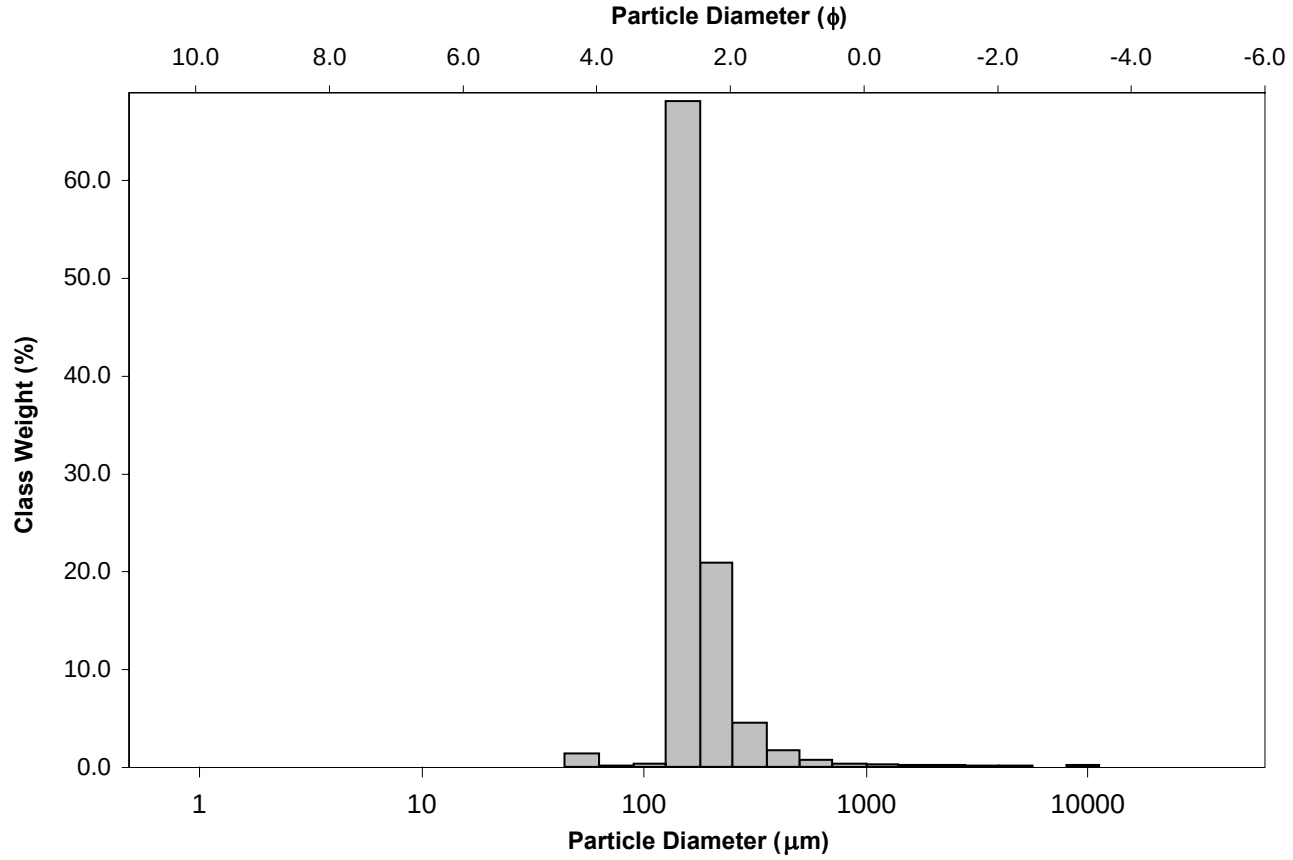
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.4	2.037
MEDIAN or D_{50}:	160.5	2.639
D_{90}:	243.7	2.939
(D_{90} / D_{10}):	1.869	1.443
(D_{90} - D_{10}):	113.3	0.902
(D_{75} / D_{25}):	1.342	1.176
(D_{75} - D_{25}):	48.16	0.424

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.8%	COARSE SAND:	1.1%
SAND:	97.8%	MEDIUM SAND:	6.1%
MUD:	1.4%	FINE SAND:	89.6%
		V FINE SAND:	0.5%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	1.4%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.0%
MEDIUM GRAVEL:	0.2%	MEDIUM SILT:	0.0%
FINE GRAVEL:	0.1%	FINE SILT:	0.0%
V FINE GRAVEL:	0.4%	V FINE SILT:	0.0%
V COARSE SAND:	0.5%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	226.8	174.6	2.518	168.1	2.572	Fine Sand
SORTING (σ):	538.2	1.559	0.641	1.306	0.386	Well Sorted
SKEWNESS (Sk):	14.54	4.049	-4.049	0.396	-0.396	Very Coarse Skewed
KURTOSIS (K):	239.0	30.92	30.92	1.326	1.326	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_44**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

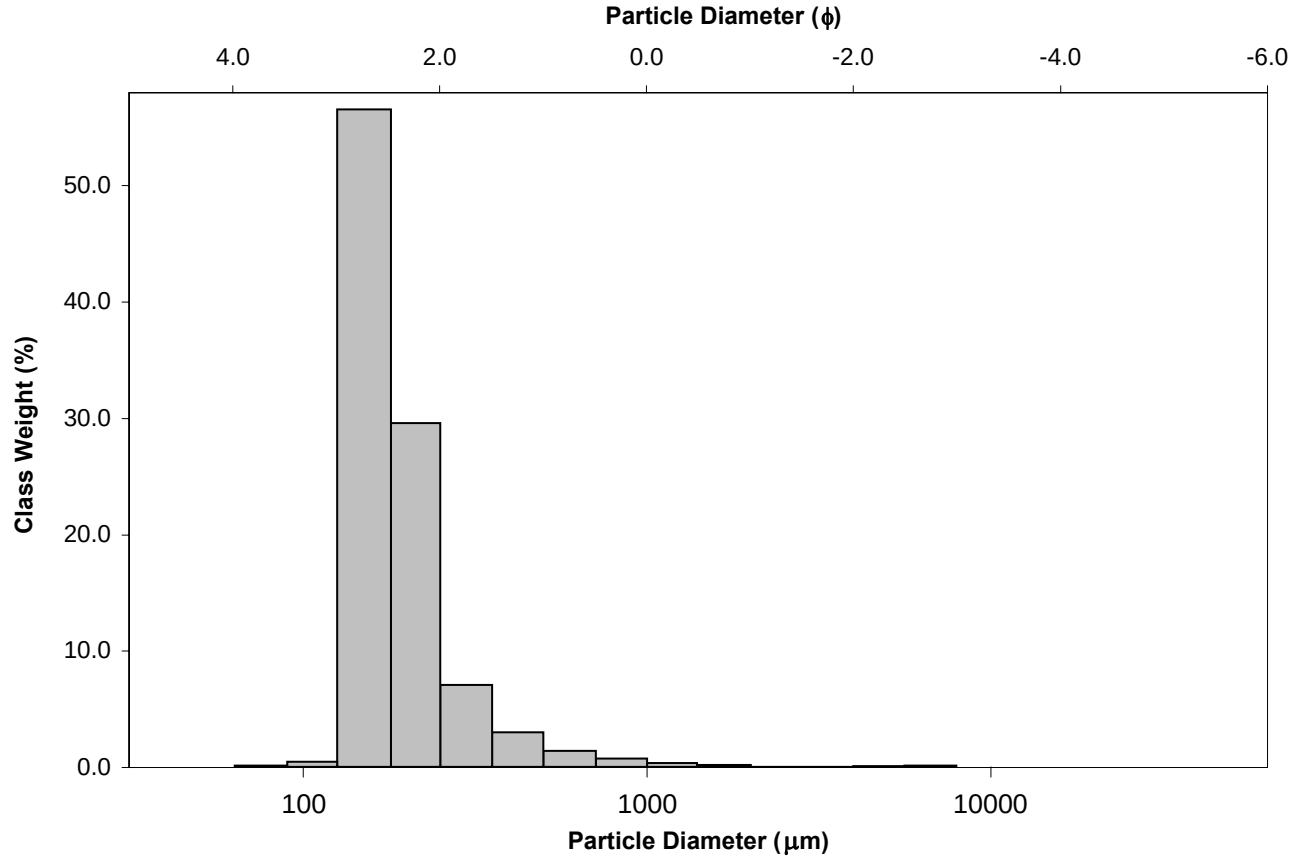
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.5	1.808
MEDIAN or D_{50}:	169.0	2.565
D_{90}:	285.6	2.927
(D_{90} / D_{10}):	2.172	1.619
(D_{90} - D_{10}):	154.1	1.119
(D_{75} / D_{25}):	1.491	1.260
(D_{75} - D_{25}):	71.01	0.577

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.3%	COARSE SAND:	2.1%
SAND:	98.4%	MEDIUM SAND:	9.8%
MUD:	1.3%	FINE SAND:	85.4%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.2%	FINE SILT:	0.2%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.2%
V COARSE SAND:	0.5%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	216.6	179.7	2.476	177.0	2.499	Fine Sand
SORTING (σ):	301.2	1.705	0.770	1.362	0.446	Well Sorted
SKEWNESS (Sk):	16.59	-1.332	1.332	0.367	-0.367	Very Coarse Skewed
KURTOSIS (K):	333.8	22.23	22.23	1.136	1.136	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_45**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

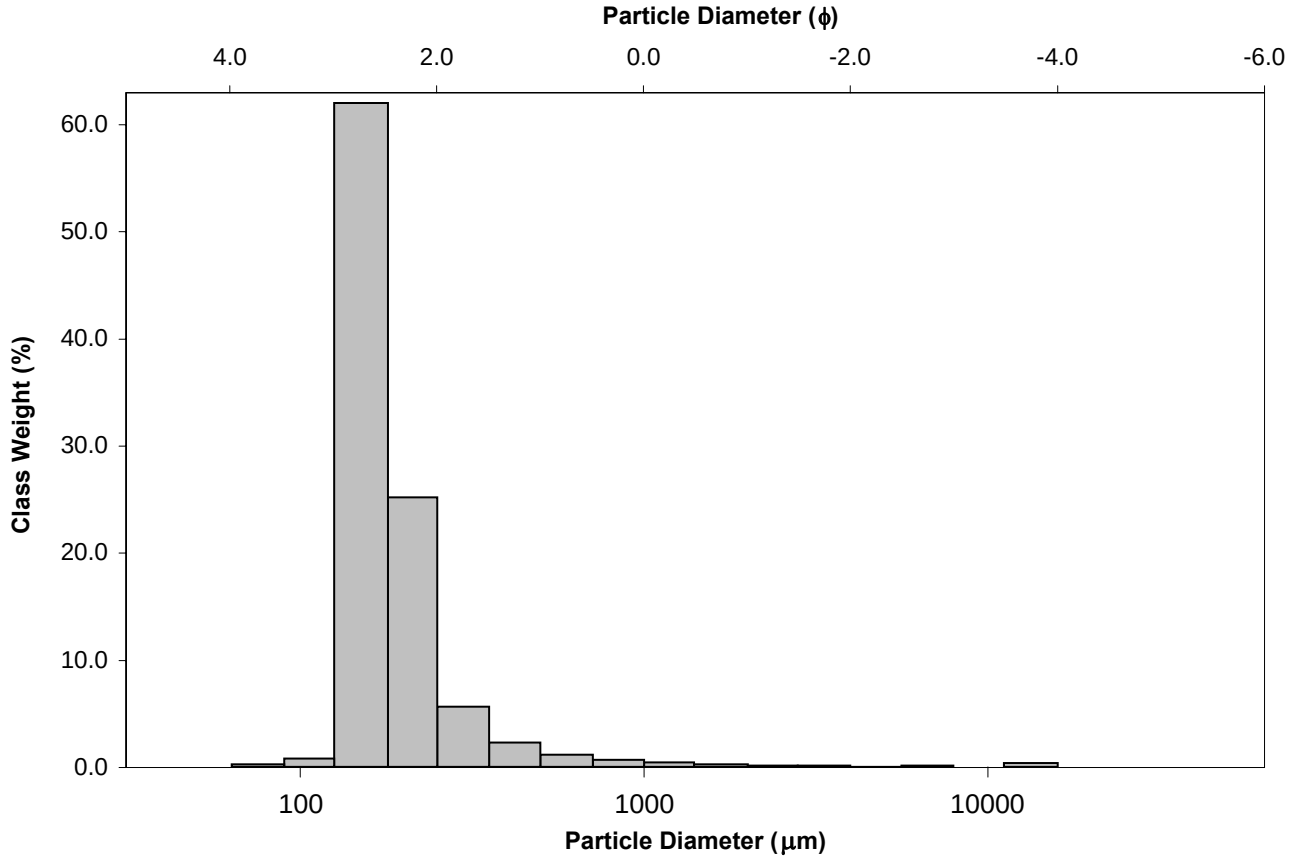
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.8	1.902
MEDIAN or D_{50}:	164.5	2.604
D_{90}:	267.5	2.935
(D_{90} / D_{10}):	2.045	1.543
(D_{90} - D_{10}):	136.7	1.032
(D_{75} / D_{25}):	1.440	1.230
(D_{75} - D_{25}):	62.77	0.526

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.9%	COARSE SAND:	1.7%
SAND:	98.0%	MEDIUM SAND:	7.7%
MUD:	1.1%	FINE SAND:	86.8%
		V FINE SAND:	1.0%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.4%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.2%	FINE SILT:	0.2%
V FINE GRAVEL:	0.3%	V FINE SILT:	0.2%
V COARSE SAND:	0.7%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	273.6	179.8	2.476	173.2	2.530	Fine Sand
SORTING (σ):	923.5	1.807	0.853	1.356	0.439	Well Sorted
SKEWNESS (Sk):	13.07	1.297	-1.297	0.409	-0.409	Very Coarse Skewed
KURTOSIS (K):	182.9	25.64	25.64	1.250	1.250	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_46**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

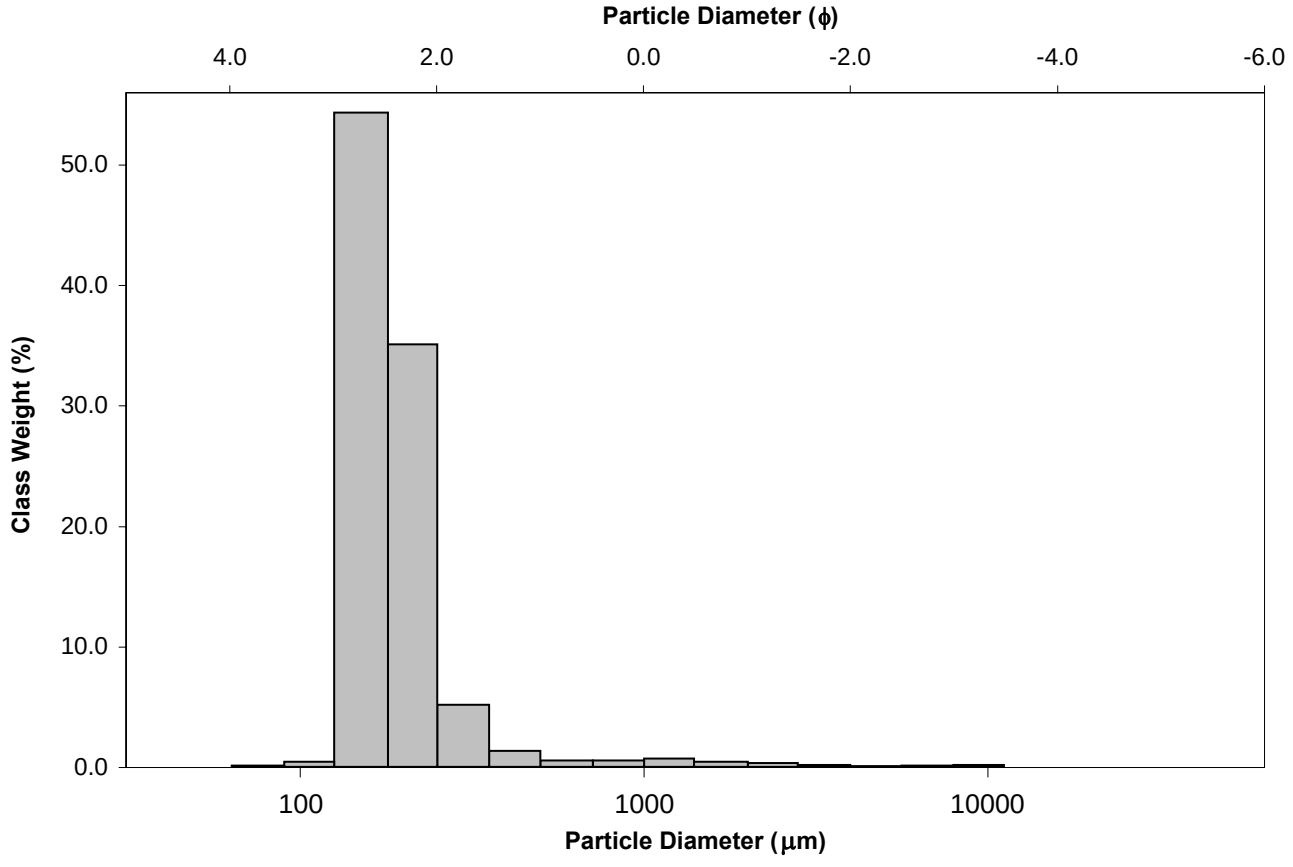
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.9	2.007
MEDIAN or D_{50}:	171.1	2.547
D_{90}:	248.8	2.922
(D_{90} / D_{10}):	1.886	1.456
(D_{90} - D_{10}):	116.9	0.916
(D_{75} / D_{25}):	1.471	1.250
(D_{75} - D_{25}):	68.54	0.557

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.9%	COARSE SAND:	1.0%
SAND:	97.9%	MEDIUM SAND:	6.5%
MUD:	1.2%	FINE SAND:	88.7%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.2%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.2%	FINE SILT:	0.2%
V FINE GRAVEL:	0.5%	V FINE SILT:	0.2%
V COARSE SAND:	1.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	243.9	182.4	2.455	176.5	2.503	Fine Sand
SORTING (σ):	522.1	1.766	0.820	1.326	0.407	Well Sorted
SKEWNESS (Sk):	13.23	0.297	-0.297	0.289	-0.289	Coarse Skewed
KURTOSIS (K):	208.5	22.73	22.73	1.040	1.040	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_48**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Bimodal, Poorly Sorted

TEXTURAL GROUP: Gravel

SEDIMENT NAME: Coarse Gravel

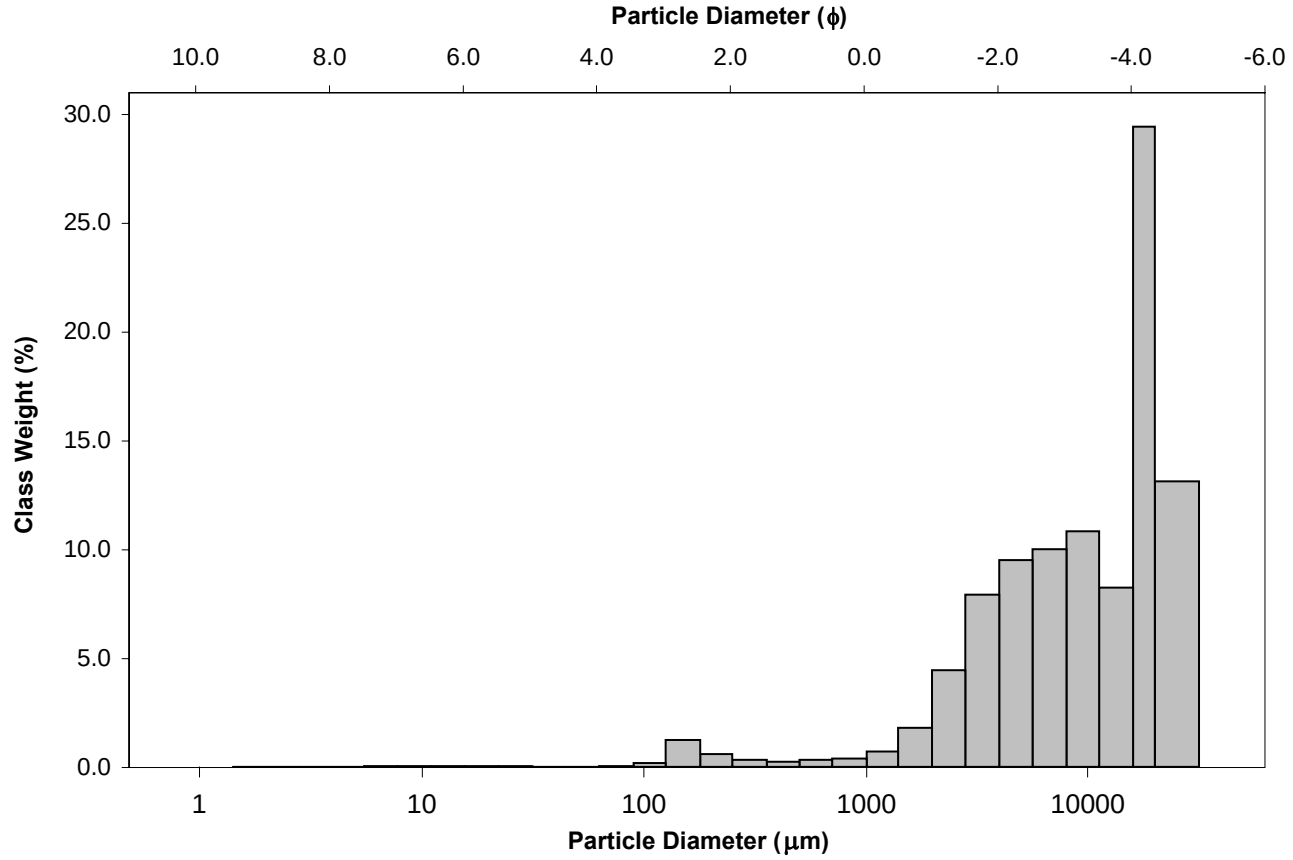
	μm	ϕ
MODE 1:	18000.0	-4.161
MODE 2:	9600.0	-3.243
MODE 3:		
D_{10}:	2548.0	-4.622
MEDIAN or D_{50}:	10493.5	-3.391
D_{90}:	24621.4	-1.349
(D_{90} / D_{10}):	9.663	0.292
(D_{90} - D_{10}):	22073.4	3.272
(D_{75} / D_{25}):	3.926	0.532
(D_{75} - D_{25}):	13868.9	1.973

GRAIN SIZE DISTRIBUTION

GRAVEL:	93.3%	COARSE SAND:	0.8%
SAND:	6.4%	MEDIUM SAND:	0.6%
MUD:	0.3%	FINE SAND:	2.0%
		V FINE SAND:	0.2%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	38.7%	COARSE SILT:	0.1%
MEDIUM GRAVEL:	20.3%	MEDIUM SILT:	0.1%
FINE GRAVEL:	20.9%	FINE SILT:	0.1%
V FINE GRAVEL:	13.4%	V FINE SILT:	0.0%
V COARSE SAND:	2.7%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	12403.6	8369.2	-3.065	9110.6	-3.188	Medium Gravel
SORTING (σ):	8371.1	3.019	1.594	2.467	1.303	Poorly Sorted
SKEWNESS (Sk):	0.331	-1.925	1.925	-0.283	0.283	Fine Skewed
KURTOSIS (K):	1.784	9.078	9.078	0.879	0.879	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_49**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Polymodal, Very Poorly Sorted

TEXTURAL GROUP: Sandy Gravel

SEDIMENT NAME: Sandy Coarse Gravel

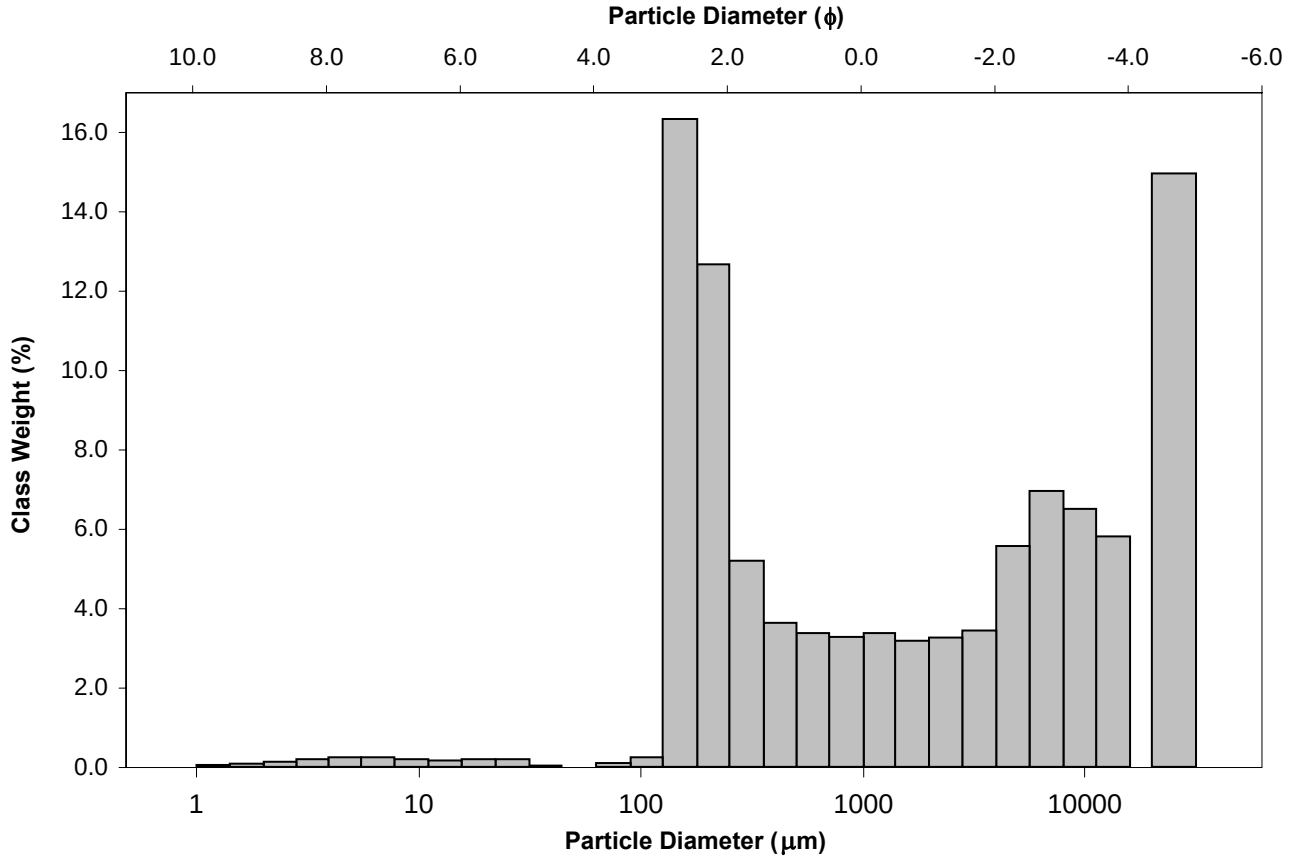
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:	25750.0	-4.650
MODE 3:	6800.0	-2.743
D_{10}:	149.3	-4.628
MEDIAN or D_{50}:	1780.9	-0.833
D_{90}:	24727.3	2.744
(D_{90} / D_{10}):	165.7	-0.593
(D_{90} - D_{10}):	24578.0	7.372
(D_{75} / D_{25}):	50.15	-0.640
(D_{75} - D_{25}):	10670.0	5.648

GRAIN SIZE DISTRIBUTION

GRAVEL:	49.0%	COARSE SAND:	6.4%
SAND:	49.3%	MEDIUM SAND:	8.4%
MUD:	1.7%	FINE SAND:	27.9%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	18.8%	COARSE SILT:	0.4%
MEDIUM GRAVEL:	11.8%	MEDIUM SILT:	0.3%
FINE GRAVEL:	12.0%	FINE SILT:	0.5%
V FINE GRAVEL:	6.4%	V FINE SILT:	0.3%
V COARSE SAND:	6.3%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	7311.0	1640.7	-0.714	1865.6	-0.900	Very Coarse Sand
SORTING (σ):	9605.0	7.892	2.980	7.518	2.910	Very Poorly Sorted
SKEWNESS (Sk):	1.147	-0.192	0.192	0.030	-0.030	Symmetrical
KURTOSIS (K):	2.700	2.080	2.080	0.559	0.559	Very Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_50**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Trimodal, Very Poorly Sorted

TEXTURAL GROUP: Gravel

SEDIMENT NAME: Coarse Gravel

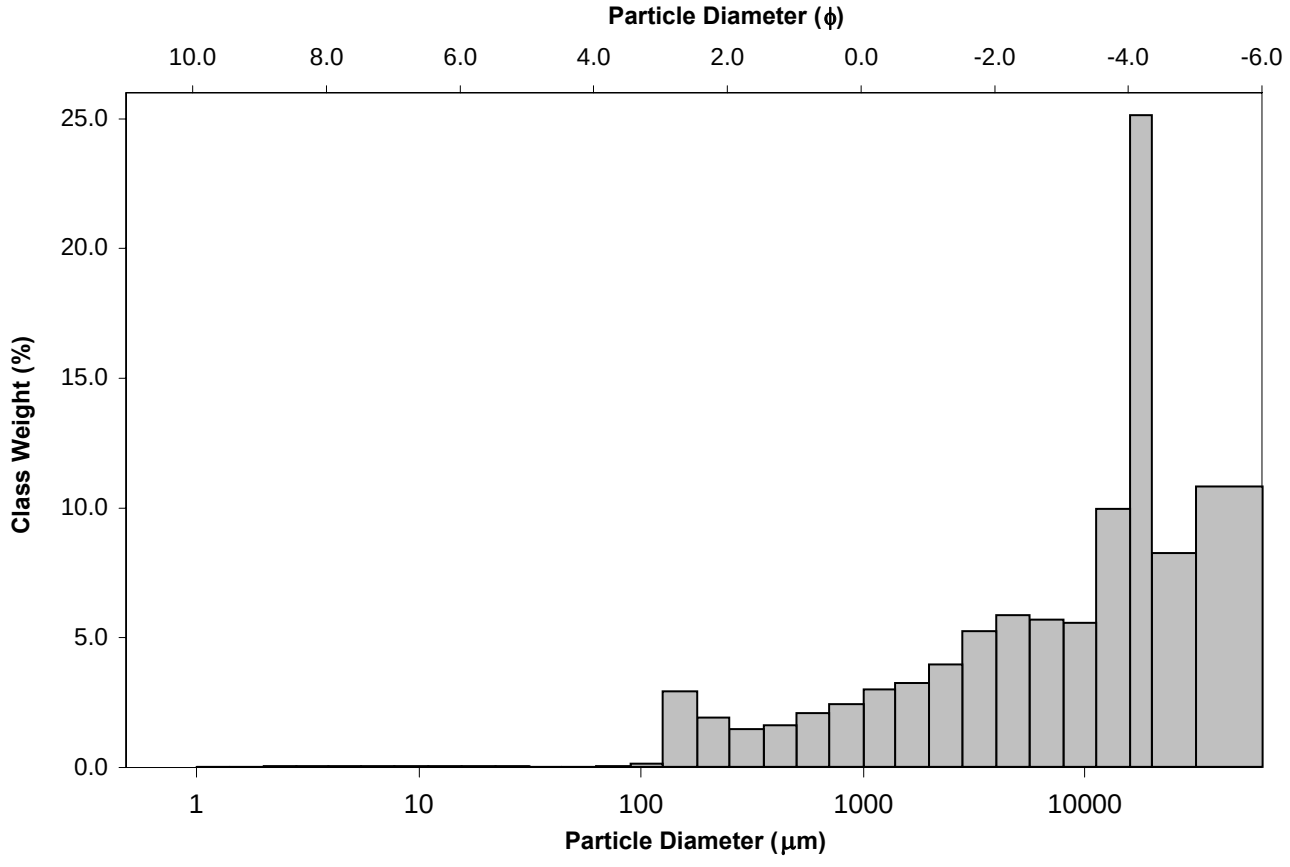
	μm	ϕ
MODE 1:	18000.0	-4.161
MODE 2:	47250.0	-5.477
MODE 3:	4800.0	-2.243
D_{10}:	694.2	-5.496
MEDIAN or D_{50}:	14178.7	-3.826
D_{90}:	45132.0	0.526
(D_{90} / D_{10}):	65.01	-0.096
(D_{90} - D_{10}):	44437.7	6.023
(D_{75} / D_{25}):	7.663	0.376
(D_{75} - D_{25}):	22768.3	2.938

GRAIN SIZE DISTRIBUTION

GRAVEL:	81.6%	COARSE SAND:	4.3%
SAND:	18.1%	MEDIUM SAND:	2.9%
MUD:	0.3%	FINE SAND:	4.7%
		V FINE SAND:	0.2%
V COARSE GRAVEL:	20.3%	V COARSE SILT:	0.0%
COARSE GRAVEL:	26.4%	COARSE SILT:	0.1%
MEDIUM GRAVEL:	15.0%	MEDIUM SILT:	0.1%
FINE GRAVEL:	11.1%	FINE SILT:	0.1%
V FINE GRAVEL:	8.9%	V FINE SILT:	0.1%
V COARSE SAND:	6.0%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	18160.8	8172.2	-3.031	9281.8	-3.214	Medium Gravel
SORTING (σ):	16761.1	5.010	2.325	5.024	2.329	Very Poorly Sorted
SKEWNESS (Sk):	0.769	-1.150	1.150	-0.454	0.454	Very Fine Skewed
KURTOSIS (K):	2.203	4.018	4.018	1.086	1.086	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_51**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

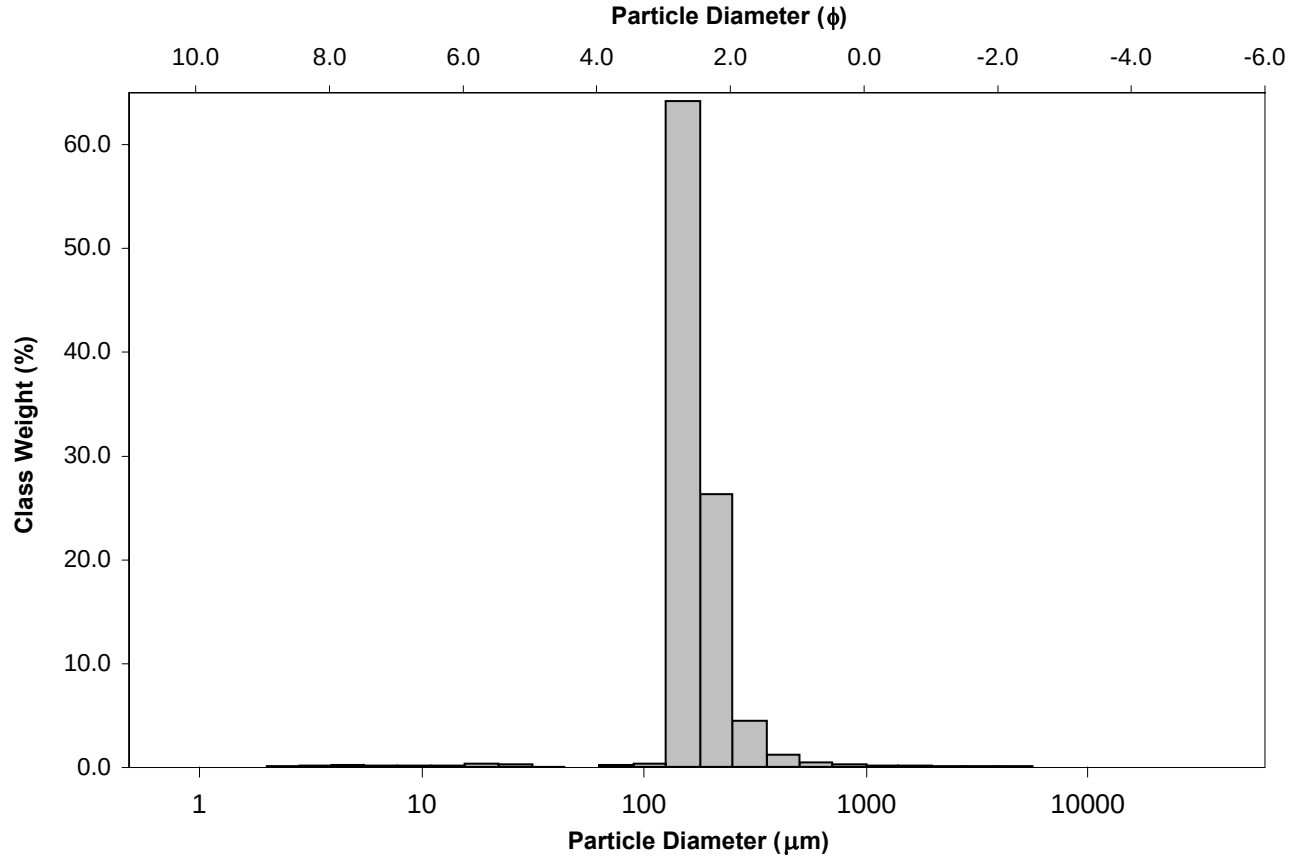
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.6	2.059
MEDIAN or D_{50}:	162.6	2.621
D_{90}:	240.0	2.937
(D_{90} / D_{10}):	1.838	1.426
(D_{90} - D_{10}):	109.4	0.878
(D_{75} / D_{25}):	1.385	1.200
(D_{75} - D_{25}):	54.54	0.470

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.3%	COARSE SAND:	0.8%
SAND:	98.2%	MEDIUM SAND:	5.6%
MUD:	1.5%	FINE SAND:	91.0%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.3%
FINE GRAVEL:	0.1%	FINE SILT:	0.4%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.2%
V COARSE SAND:	0.3%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	192.9	167.7	2.576	169.4	2.562	Fine Sand
SORTING (σ):	208.0	1.613	0.690	1.284	0.360	Well Sorted
SKEWNESS (Sk):	15.01	-2.314	2.314	0.326	-0.326	Very Coarse Skewed
KURTOSIS (K):	279.0	32.39	32.39	1.047	1.047	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_52**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Unimodal, Very Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

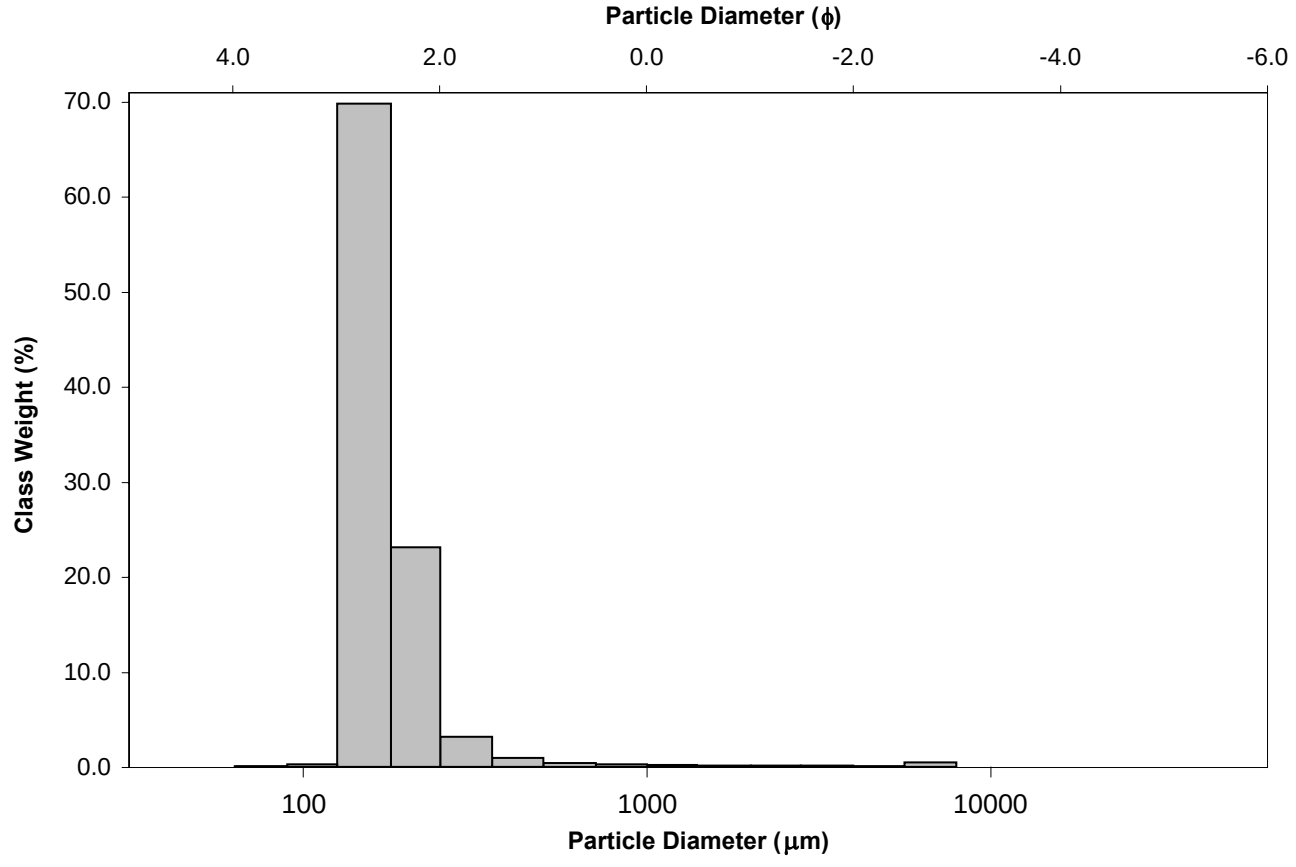
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.3	2.090
MEDIAN or D_{50}:	160.0	2.644
D_{90}:	234.9	2.941
(D_{90} / D_{10}):	1.804	1.407
(D_{90} - D_{10}):	104.7	0.851
(D_{75} / D_{25}):	1.322	1.166
(D_{75} - D_{25}):	45.36	0.403

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.9%	COARSE SAND:	0.7%
SAND:	97.5%	MEDIUM SAND:	4.0%
MUD:	1.6%	FINE SAND:	92.0%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.3%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.3%
FINE GRAVEL:	0.6%	FINE SILT:	0.3%
V FINE GRAVEL:	0.3%	V FINE SILT:	0.3%
V COARSE SAND:	0.4%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	225.9	166.8	2.584	166.3	2.588	Fine Sand
SORTING (σ):	523.9	1.765	0.819	1.267	0.341	Very Well Sorted
SKEWNESS (Sk):	11.19	-0.101	0.101	0.332	-0.332	Very Coarse Skewed
KURTOSIS (K):	134.5	26.51	26.51	1.160	1.160	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TB_GRAB_53**

ANALYST & DATE: Tessa Caley, 10/8/2012

SAMPLE TYPE: Polymodal, Very Poorly Sorted

TEXTURAL GROUP: Muddy Sandy Gravel

SEDIMENT NAME: Fine Silty Sandy Coarse Gravel

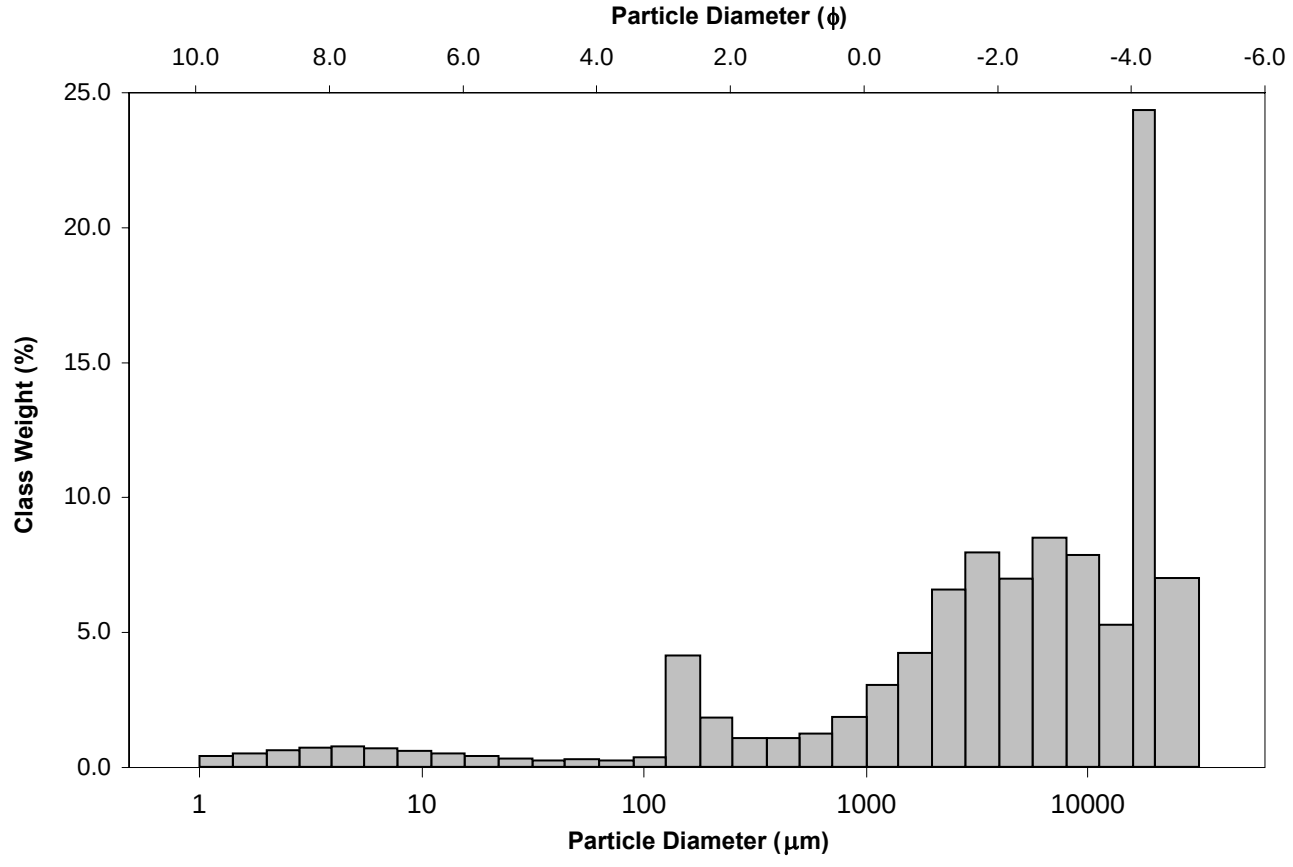
	μm	ϕ
MODE 1:	18000.0	-4.161
MODE 2:	6800.0	-2.743
MODE 3:	3400.0	-1.743
D_{10}:	148.8	-4.318
MEDIAN or D_{50}:	5521.8	-2.465
D_{90}:	19943.2	2.749
(D_{90} / D_{10}):	134.0	-0.637
(D_{90} - D_{10}):	19794.4	7.066
(D_{75} / D_{25}):	9.946	0.177
(D_{75} - D_{25}):	14678.1	3.314

GRAIN SIZE DISTRIBUTION

GRAVEL:	72.4%	COARSE SAND:	3.3%
SAND:	20.4%	MEDIUM SAND:	2.3%
MUD:	7.2%	FINE SAND:	6.5%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.5%
COARSE GRAVEL:	26.5%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	13.9%	MEDIUM SILT:	1.2%
FINE GRAVEL:	16.5%	FINE SILT:	1.6%
V FINE GRAVEL:	15.5%	V FINE SILT:	1.4%
V COARSE SAND:	7.8%	CLAY:	1.7%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	8692.8	2911.1	-1.542	3510.2	-1.812	Very Fine Gravel
SORTING (σ):	8317.7	9.625	3.267	8.483	3.085	Very Poorly Sorted
SKEWNESS (Sk):	0.770	-1.703	1.703	-0.489	0.489	Very Fine Skewed
KURTOSIS (K):	2.297	5.632	5.632	1.409	1.409	Leptokurtic

GRAIN SIZE DISTRIBUTION



APPENDIX C - PARTICLE SIZE ANALYSIS

Teesside Cable Corridor

Table C.2 Teesside Cable Corridor Sediment Characteristics

Station	Mean Diameter (µm)	Mean Diameter (phi)	Fines %	Sand %	Gravel %	Wentworth Classification (based on mean grain size)	Sorting[1]	Modified Folk Classification	Total Organic Carbon[2] (%)
Inshore Stations (Northern Route)									
TCC_01	152.5	2.7	2.6	97.3	0.2	Fine Sand	Very Well	(g)S	0.44
TCC_03	153	2.7	2.3	97.6	0.1	Fine Sand	Very Well	(g)S	0.47
TCC_05	155.7	2.7	6.8	93.2	0	Fine Sand	Moderately Well	(g)S	0.45
TCC_06	105.6	3.2	21.2	78.8	0.1	Very Fine Sand	Poor	(g)mS	2.31
TCC_09	34.4	4.9	62	37.9	0.1	Very Coarse Silt	Very Poor	(g)sM	3.45
TCC_10	60.2	4.1	35.3	64.4	0.4	Very Coarse Silt	Poor	(g)mS	4.60
TCC_12	410.7	1.3	13.1	63.8	23.1	Medium Sand	Very Poor	gmS	2.13
TCC_14	481.8	1.1	10.6	64.9	24.5	Medium Sand	Very Poor	gmS	
Offshore Stations (Northern Route)									
TCC_16	632.9	0.7	6	68.2	25.8	Coarse Sand	Very Poor	gS	
TCC_18	359.3	1.5	2	83.3	14.7	Medium Sand	Very Poor	gS	1.39
TCC_22	184.5	2.4	1.9	97.9	0.2	Fine Sand	Moderately Well	(g)S	
TCC_24	180.1	2.5	2.5	97.4	0.1	Fine Sand	Moderately Well	(g)S	
TCC_25	175.3	2.5	2	97.8	0.1	Fine Sand	Well Sorted	(g)S	
TCC_26	164.3	2.6	2.7	97.2	0.1	Fine Sand	Well Sorted	(g)S	
TCC_27	150.2	2.7	3.4	96.6	0.1	Fine Sand	Very Well	(g)S	0.48
TCC_29	160.1	2.6	4.5	95.2	0.3	Fine Sand	Well Sorted	(g)S	
TCC_31	153.4	2.7	3.7	96.1	0.2	Fine Sand	Very Well	(g)S	
TCC_32	201	2.3	2.7	96.9	0.5	Fine Sand	Moderately Well	(g)S	
TCC_35	190.3	2.4	3.9	95.1	0.9	Fine Sand	Moderately Well	(g)S	
TCC_37	333.1	1.6	2.4	83	14.6	Medium Sand	Poor	gS	
TCC_39	182.4	2.5	3.4	95.6	0.9	Fine Sand	Moderately Well	(g)S	
TCC_40	151.4	2.7	6	93.9	0.1	Fine Sand	Moderately Well	(g)S	0.84
TCC_42	181.6	2.5	6.2	93	0.9	Fine Sand	Moderate	(g)S	
TCC_43	151.4	2.7	6.8	93.1	0.1	Fine Sand	Moderate	(g)S	
TCC_45	234.8	2.1	2.9	83.9	13.2	Fine Sand	Poor	gS	
TCC_46	196.5	2.3	9.7	86.3	4	Fine Sand	Poor	(g)mS	
TCC_47	176.5	2.5	6	93.8	0.2	Fine Sand	Moderate	(g)S	
TCC_48	213.2	2.2	5.9	93.5	0.7	Fine Sand	Moderate	(g)S	1.24
TCC_49	149.5	2.7	5.2	94.6	0.2	Fine Sand	Well Sorted	(g)S	
TCC_52	179.6	2.5	2.9	96.2	0.9	Fine Sand	Moderately Well	(g)S	
TCC_53	933.7	0.1	2.7	54.2	43.1	Coarse Sand	Very Poor	sG	
TCC_54	151.3	2.7	5.1	94.9	0	Fine Sand	Well Sorted	(g)S	0.58
TCC_55	153	2.7	2.9	97	0.1	Fine Sand	Very Well	(g)S	
TCC_56	279.5	1.8	3	83.1	14	Medium Sand	Poor	gS	
TCC_57	203.6	2.3	1.3	98.6	0.1	Fine Sand	Very Well	(g)S	
Inshore Stations (Southern Route)									
TCC_61	150.3	2.7	3.6	96.4	0.1	Fine Sand	Very Well	(g)S	1.36
TCC_62	150.3	2.7	3.7	96.2	0.1	Fine Sand	Very Well	(g)S	0.51
TCC_64	153.1	2.7	2.8	96.9	0.3	Fine Sand	Very Well	(g)S	0.73
TCC_71	255.8	2	20.7	63.2	16.1	Medium Sand	Very Poor	gmS	
TCC_75	839.9	0.3	9.8	58.4	31.8	Coarse Sand	Very Poor	msG	2.61
TCC_76	5889.8	-2.6	5	33.5	61.5	Fine Gravel	Very Poor	msG	
Offshore Stations (Southern Route)									
TCC_78	325.9	1.6	1.2	91.5	7.2	Medium Sand	Poor	gS	
TCC_79	278.6	1.8	1.8	96.9	1.3	Medium Sand	Moderate	(g)S	
TCC_80	534.5	0.9	2.1	78.9	19	Coarse Sand	Poor	gS	
TCC_82	266.1	1.9	1.4	97.6	1	Medium Sand	Moderate	(g)S	
TCC_84	171.6	2.5	1.5	98.4	0	Fine Sand	Well Sorted	(g)S	
TCC_85	187.5	2.4	1.3	98.7	0.1	Fine Sand	Well Sorted	(g)S	
TCC_86	154.3	2.7	1.6	98.3	0.1	Fine Sand	Very Well	(g)S	0.51
TCC_87	204.1	2.3	2.5	97.2	0.2	Fine Sand	Moderately Well	(g)S	
TCC_90	197	2.3	2.5	97.4	0.1	Fine Sand	Moderately Well	(g)S	
TCC_92	202	2.3	2.5	97.3	0.2	Fine Sand	Moderately Well	(g)S	
TCC_93	192.6	2.4	1.8	98	0.2	Fine Sand	Moderately Well	(g)S	
TCC_94	179.2	2.5	2.2	97.7	0.1	Fine Sand	Well Sorted	(g)S	
TCC_95	186	2.4	1.6	98.3	0.1	Fine Sand	Moderately Well	(g)S	0.41
TCC_97	206.5	2.3	3	95.9	1.1	Fine Sand	Moderately Well	(g)S	
TCC_99	188.2	2.4	3	96.4	0.5	Fine Sand	Moderately Well	(g)S	
TCC_100	153.8	2.7	2.1	97.7	0.2	Fine Sand	Very Well	(g)S	
TCC_101	150.4	2.7	3.2	96.8	0.1	Fine Sand	Very Well	(g)S	
TCC_102	149.8	2.7	3.4	96.4	0.1	Fine Sand	Very Well	(g)S	0.44
TCC_103	153	2.7	4.8	95.1	0.1	Fine Sand	Well Sorted	(g)S	
TCC_106	155.2	2.7	7.4	92.6	0	Fine Sand	Moderate	(g)S	
TCC_107	152	2.7	4.9	95	0.1	Fine Sand	Well Sorted	(g)S	
TCC_109	177.6	2.5	2.6	97.4	0	Fine Sand	Well Sorted	(g)S	1.12
TCC_111	218	2.2	2.3	89.1	8.6	Fine Sand	Poor	gS	
TCC_112	201.3	2.3	2	97.9	0	Fine Sand	Well Sorted	(g)S	
TCC_113	173.7	2.5	3	96	1	Fine Sand	Well Sorted	(g)S	
TCC_114	170.9	2.5	2.1	97.6	0.4	Fine Sand	Very Well	(g)S	<0.4
TCC_115	2497.9	-1.3	0.8	34.4	64.8	Very Fine Gravel	Very Poor	sG	
TCC_116	164.3	2.6	2.4	97.3	0.4	Fine Sand	Very Well	(g)S	
TCC_118	197.3	2.3	1.5	85.8	12.7	Fine Sand	Poor	gS	
TCC_120	160.5	2.6	1.4	97.3	1.3	Fine Sand	Very Well	(g)S	
Min	**34.4**	**-2.6**	**0.8**	**33.5**	**0**				**<0.4**
Max	**5889.8**	**4.9**	**62**	**98.7**	**64.8**	**Very Fine Sand to Fine Gravel**	**Very Poor to Very Well**	**(g)mS to msG**	**4.60**
Mean	**334.7**	**2.2**	**5.4**	**88.8**	**5.8**				**1.30**
SD	**736.1**	**1**	**8.6**	**15.6**	**13.1**				**1.16**

Sediments were treated to remove carbonates prior to analyses

1 Sorting according to Folk and Ward (1957)

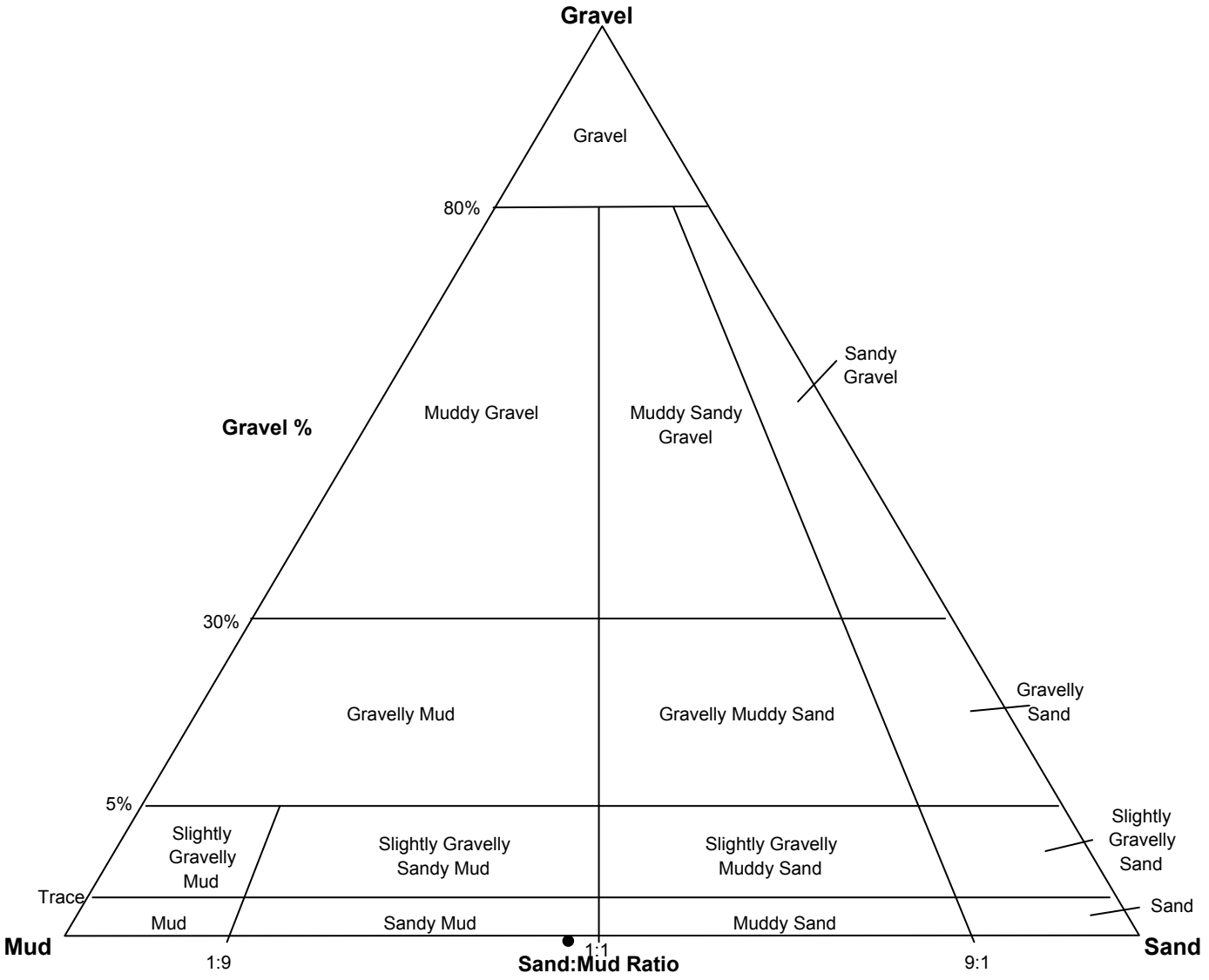
2 Concentrations only available for 21 stations selected for physico-chemistry sampling

g(S): slightly gravelly sand; (g)mS: slightly gravelly muddy sand; (g)sM: slightly gravelly sandy mud; gmS: gravelly muddy sand; gS: gravelly sand; (g)S: slightly gravelly sand; sG: sandy gravel; msG: muddy sandy gravel

APPENDIX C - PARTICLE SIZE ANALYSIS

Teesside Cable Corridor

GRADISTAT MODIFIED FOLK TRIANGLE



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_01** ANALYST & DATE: Mj.Grey, 11/23/2012

SAMPLE TYPE: Unimodal, Very Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

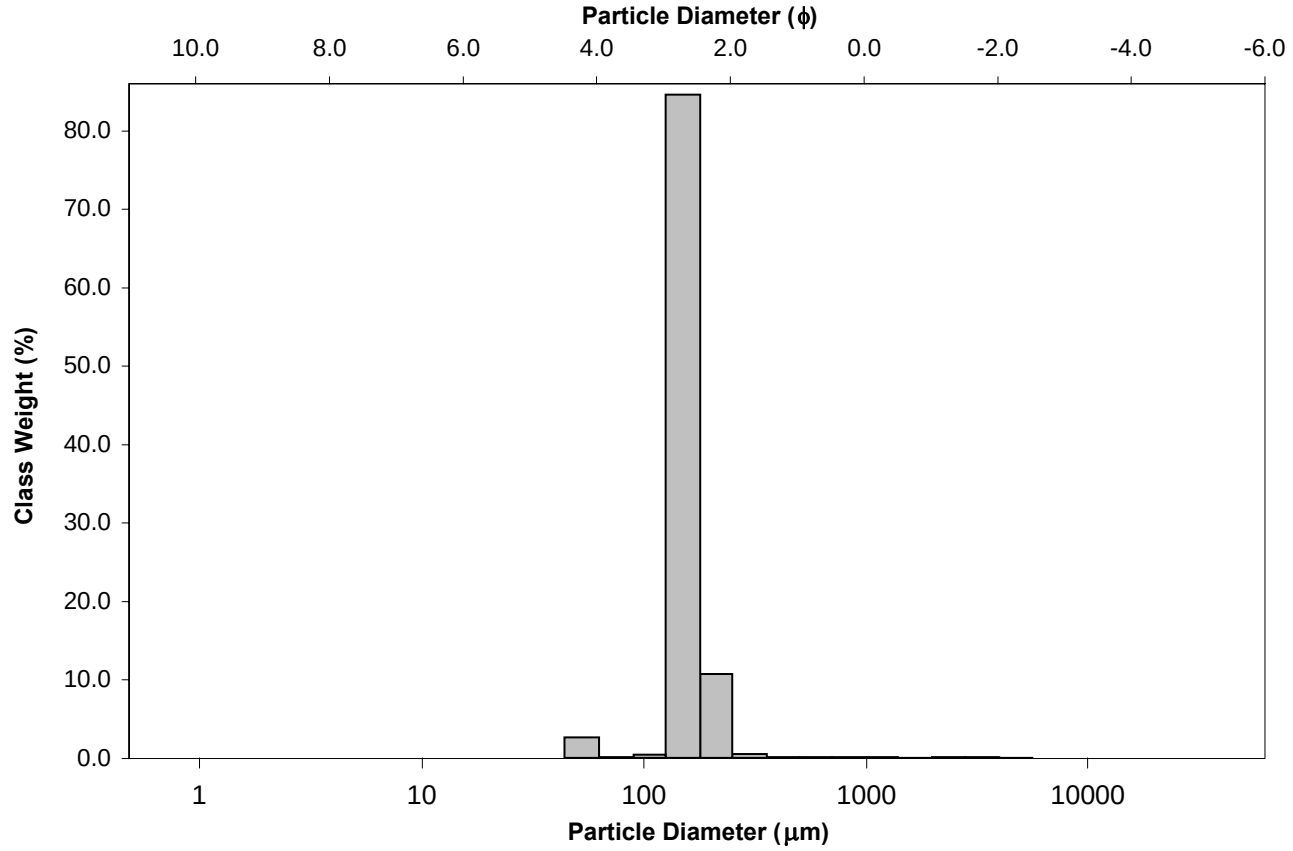
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	128.7	2.430
MEDIAN or D_{50}:	152.5	2.713
D_{90}:	185.6	2.958
(D_{90} / D_{10}):	1.442	1.218
(D_{90} - D_{10}):	56.93	0.528
(D_{75} / D_{25}):	1.236	1.120
(D_{75} - D_{25}):	32.41	0.306

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	0.2%
SAND:	97.3%	MEDIUM SAND:	0.6%
MUD:	2.6%	FINE SAND:	95.8%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	2.6%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.0%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.0%
FINE GRAVEL:	0.0%	FINE SILT:	0.0%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.0%
V COARSE SAND:	0.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	164.6	153.0	2.709	152.5	2.713	Fine Sand
SORTING (σ):	142.1	1.305	0.384	1.169	0.225	Very Well Sorted
SKEWNESS (Sk):	21.26	2.121	-2.121	0.156	-0.156	Coarse Skewed
KURTOSIS (K):	534.3	43.77	43.77	1.072	1.072	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_03** ANALYST & DATE: Mj.Grey, 11/23/2012

SAMPLE TYPE: Unimodal, Very Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

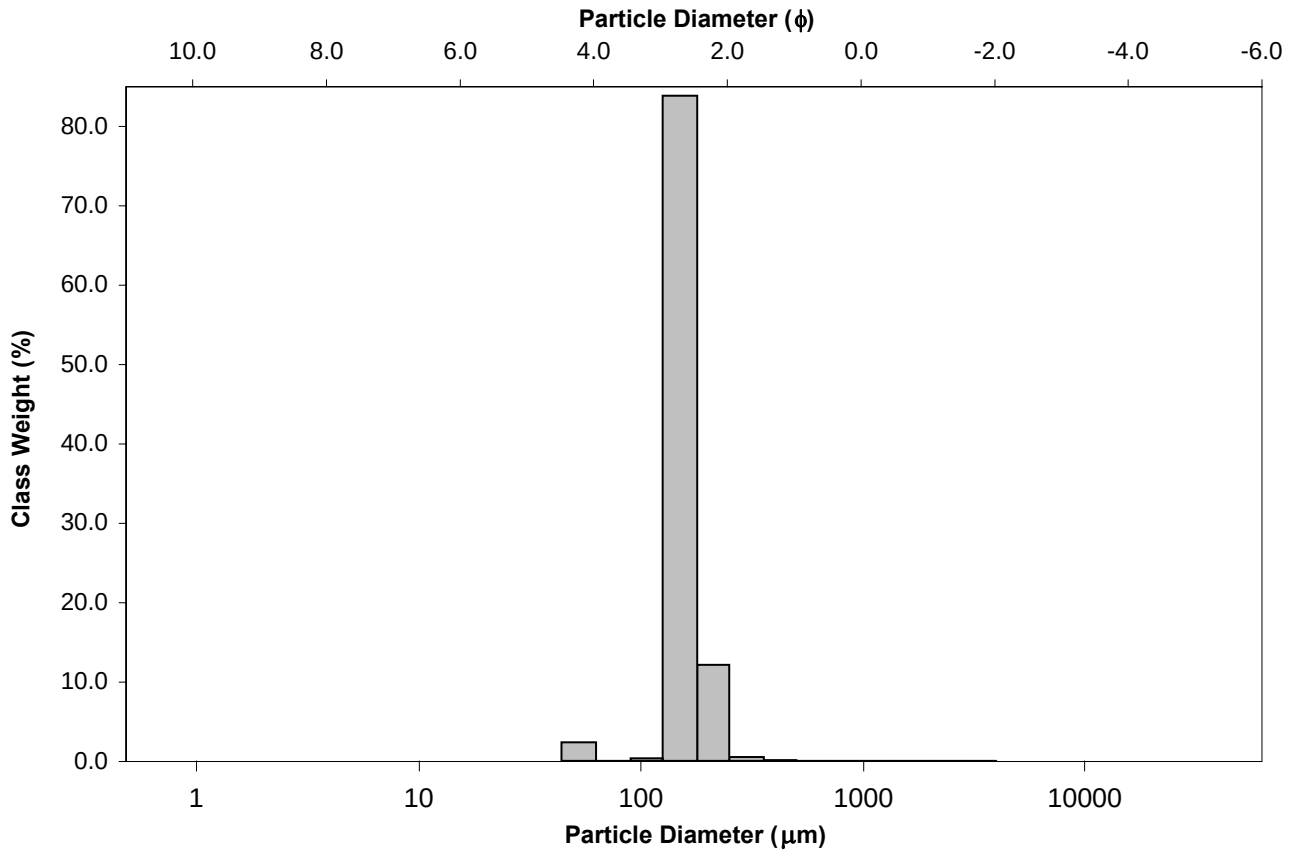
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	128.9	2.390
MEDIAN or D_{50}:	153.0	2.709
D_{90}:	190.7	2.955
(D_{90} / D_{10}):	1.479	1.236
(D_{90} - D_{10}):	61.81	0.565
(D_{75} / D_{25}):	1.238	1.121
(D_{75} - D_{25}):	32.77	0.308

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.1%
SAND:	97.6%	MEDIUM SAND:	0.6%
MUD:	2.3%	FINE SAND:	96.3%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	2.3%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.0%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.0%
FINE GRAVEL:	0.0%	FINE SILT:	0.0%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.0%
V COARSE SAND:	0.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	162.0	153.4	2.705	153.0	2.709	Fine Sand
SORTING (σ):	97.39	1.271	0.346	1.171	0.228	Very Well Sorted
SKEWNESS (Sk):	23.89	0.869	-0.869	0.157	-0.157	Coarse Skewed
KURTOSIS (K):	691.3	38.14	38.14	1.076	1.076	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_05** ANALYST & DATE: Mj.Grey, 11/23/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

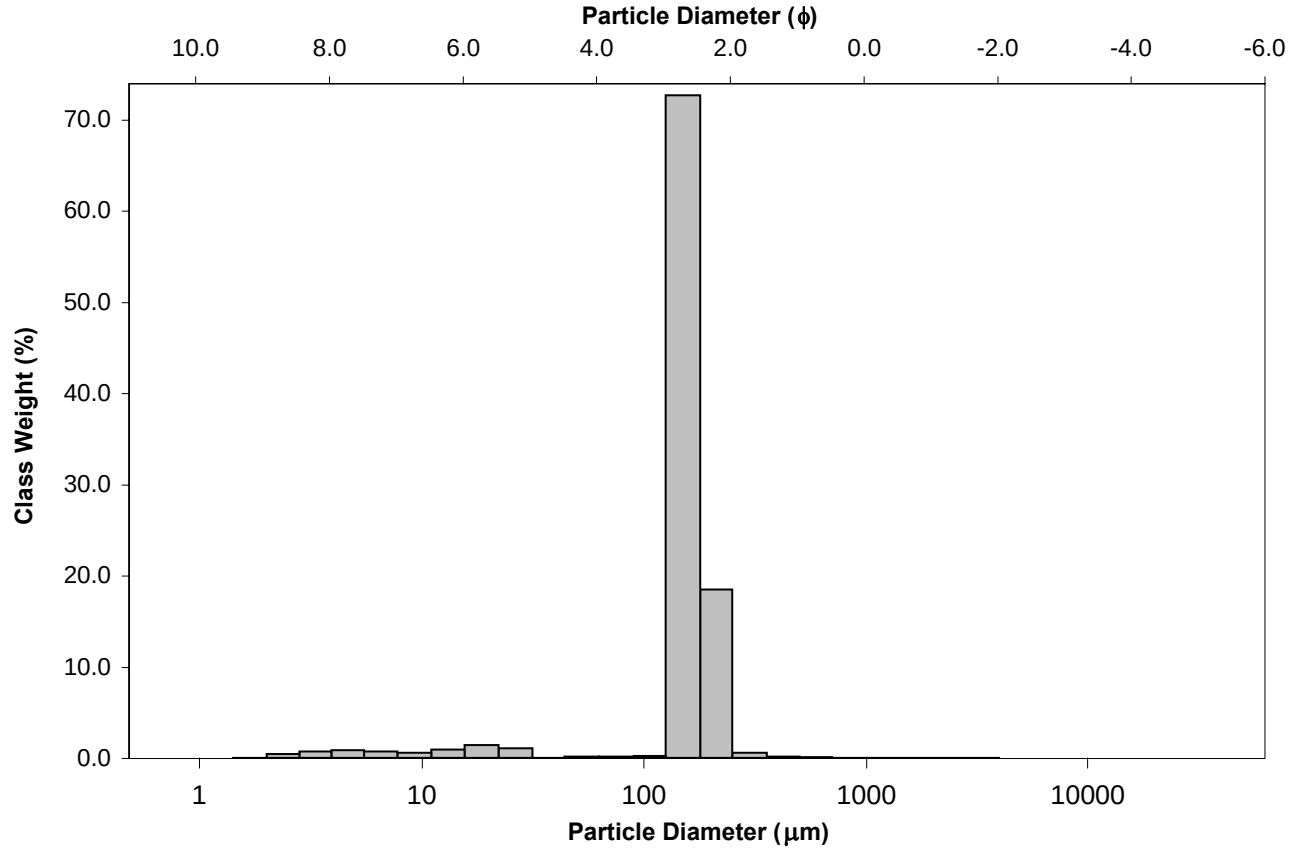
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	126.7	2.249
MEDIAN or D_{50}:	154.1	2.698
D_{90}:	210.4	2.980
(D_{90} / D_{10}):	1.660	1.325
(D_{90} - D_{10}):	83.65	0.731
(D_{75} / D_{25}):	1.277	1.140
(D_{75} - D_{25}):	37.71	0.352

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.0%	COARSE SAND:	0.1%
SAND:	93.2%	MEDIUM SAND:	0.8%
MUD:	6.8%	FINE SAND:	91.8%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	2.4%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	1.5%
FINE GRAVEL:	0.0%	FINE SILT:	1.5%
V FINE GRAVEL:	0.0%	V FINE SILT:	1.1%
V COARSE SAND:	0.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	157.5	133.7	2.903	155.7	2.684	Fine Sand
SORTING (σ):	82.96	2.114	1.080	1.597	0.675	Moderately Well Sorted
SKEWNESS (Sk):	19.34	-3.514	3.514	-0.294	0.294	Fine Skewed
KURTOSIS (K):	652.7	16.00	16.00	4.178	4.178	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_06** ANALYST & DATE: Mj.Grey, 11/23/2012

SAMPLE TYPE: Unimodal, Poorly Sorted TEXTURAL GROUP: Slightly Gravelly Muddy Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Very Coarse Silty Fine Sand

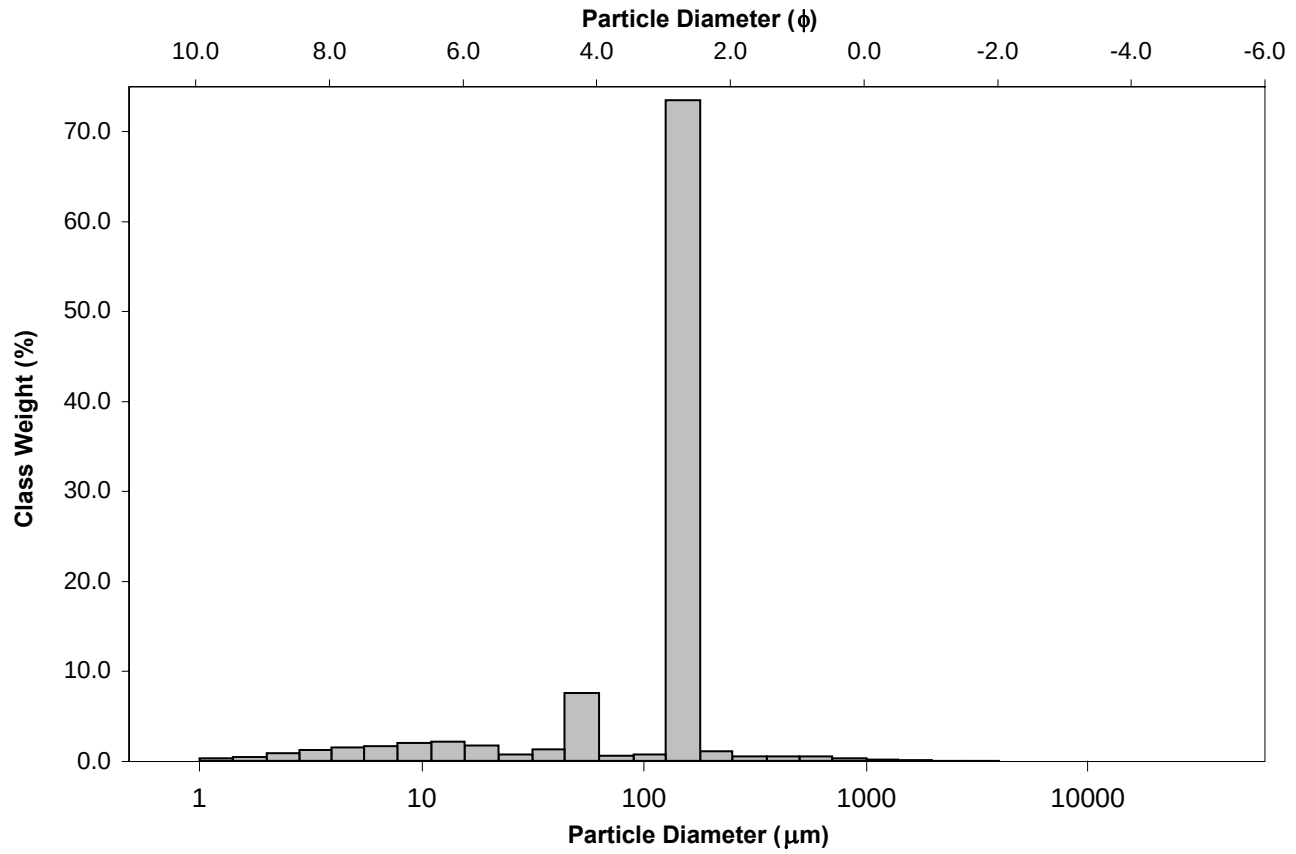
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	14.83	2.522
MEDIAN or D_{50}:	143.0	2.806
D_{90}:	174.1	6.075
(D_{90} / D_{10}):	11.73	2.409
(D_{90} - D_{10}):	159.2	3.553
(D_{75} / D_{25}):	1.278	1.135
(D_{75} - D_{25}):	35.20	0.354

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.9%
SAND:	78.8%	MEDIUM SAND:	1.1%
MUD:	21.2%	FINE SAND:	75.2%
		V FINE SAND:	1.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	8.5%
COARSE GRAVEL:	0.0%	COARSE SILT:	2.3%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	4.0%
FINE GRAVEL:	0.0%	FINE SILT:	3.1%
V FINE GRAVEL:	0.1%	V FINE SILT:	2.0%
V COARSE SAND:	0.3%	CLAY:	1.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	137.1	94.71	3.400	105.6	3.243	Very Fine Sand
SORTING (σ):	122.1	3.055	1.611	2.288	1.194	Poorly Sorted
SKEWNESS (Sk):	11.06	-2.070	2.070	-0.801	0.801	Very Fine Skewed
KURTOSIS (K):	217.6	7.120	7.120	5.694	5.694	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_09** ANALYST & DATE: Mj.Grey, 11/23/2012

SAMPLE TYPE: Bimodal, Very Poorly Sorted TEXTURAL GROUP: Slightly Gravelly Sandy Mud

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sandy Very Coarse Silt

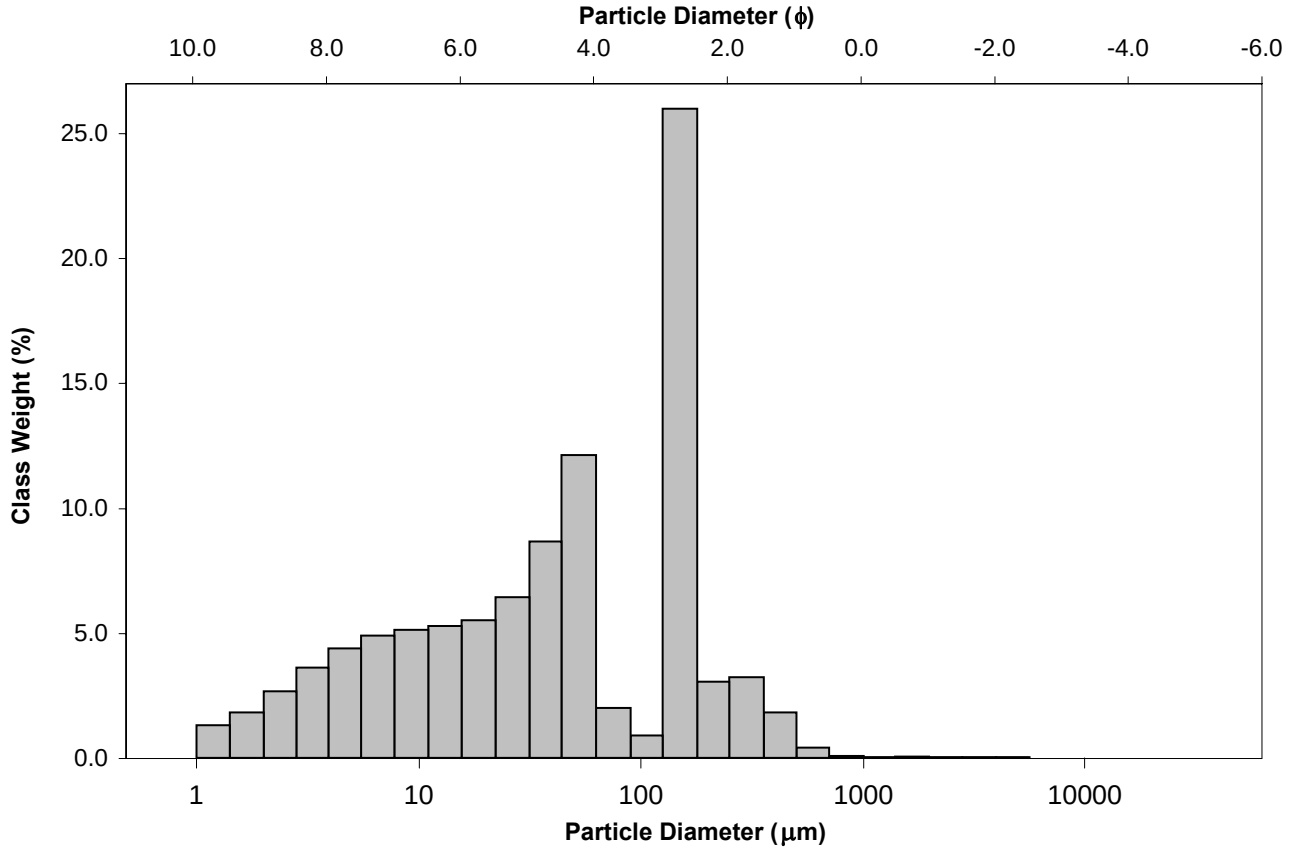
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:	53.50	4.247
MODE 3:		
D_{10}:	3.476	2.506
MEDIAN or D_{50}:	43.80	4.513
D_{90}:	176.1	8.168
(D_{90} / D_{10}):	50.66	3.260
(D_{90} - D_{10}):	172.6	5.663
(D_{75} / D_{25}):	13.11	2.324
(D_{75} - D_{25}):	132.3	3.713

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.5%
SAND:	37.9%	MEDIUM SAND:	4.9%
MUD:	62.0%	FINE SAND:	29.3%
		V FINE SAND:	3.1%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	20.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	11.6%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	10.1%
FINE GRAVEL:	0.0%	FINE SILT:	9.0%
V FINE GRAVEL:	0.1%	V FINE SILT:	6.0%
V COARSE SAND:	0.1%	CLAY:	5.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	87.88	34.67	4.850	34.45	4.859	Very Coarse Silt
SORTING (σ):	152.1	4.792	2.261	4.876	2.286	Very Poorly Sorted
SKEWNESS (Sk):	14.60	-0.463	0.463	-0.243	0.243	Fine Skewed
KURTOSIS (K):	374.5	2.351	2.351	0.788	0.788	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_10** ANALYST & DATE: Mj.Grey, 11/23/2012

SAMPLE TYPE: Unimodal, Poorly Sorted TEXTURAL GROUP: Slightly Gravelly Muddy Sand

SEDIMENT NAME: Slightly Medium Gravelly Very Coarse Silty Fine Sand

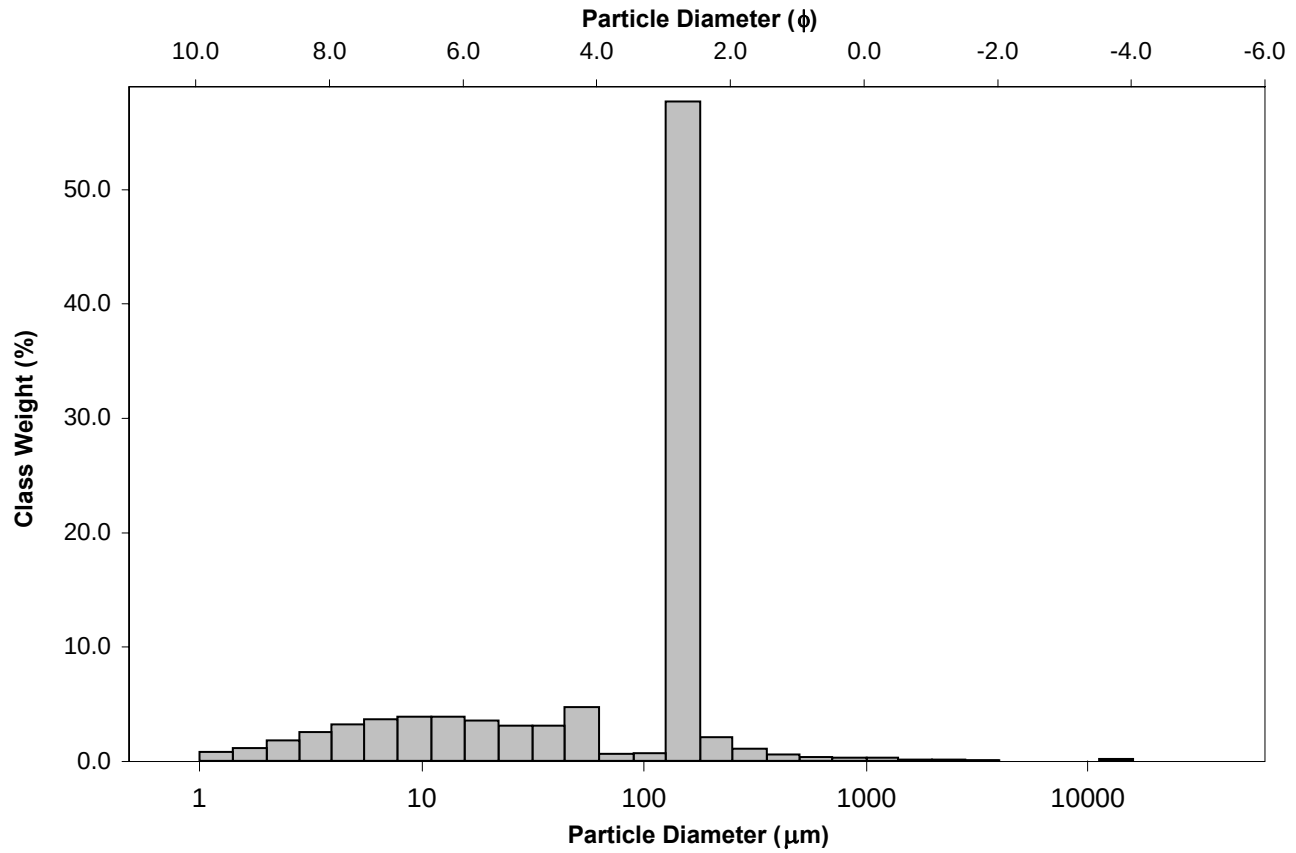
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	5.347	2.520
MEDIAN or D_{50}:	135.9	2.880
D_{90}:	174.4	7.547
(D_{90} / D_{10}):	32.61	2.995
(D_{90} - D_{10}):	169.0	5.027
(D_{75} / D_{25}):	6.969	2.055
(D_{75} - D_{25}):	136.0	2.801

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.4%	COARSE SAND:	0.6%
SAND:	64.4%	MEDIUM SAND:	1.6%
MUD:	35.3%	FINE SAND:	60.3%
		V FINE SAND:	1.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	7.6%
COARSE GRAVEL:	0.0%	COARSE SILT:	6.4%
MEDIUM GRAVEL:	0.2%	MEDIUM SILT:	7.5%
FINE GRAVEL:	0.0%	FINE SILT:	6.6%
V FINE GRAVEL:	0.2%	V FINE SILT:	4.1%
V COARSE SAND:	0.4%	CLAY:	3.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	148.8	61.49	4.024	60.18	4.054	Very Coarse Silt
SORTING (σ):	626.4	4.478	2.163	3.833	1.938	Poorly Sorted
SKEWNESS (Sk):	20.15	-0.977	0.977	-0.858	0.858	Very Fine Skewed
KURTOSIS (K):	429.8	3.414	3.414	0.873	0.873	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_12** ANALYST & DATE: Mj.Grey, 11/23/2012

SAMPLE TYPE: Unimodal, Very Poorly Sorted TEXTURAL GROUP: Gravelly Muddy Sand

SEDIMENT NAME: Very Fine Gravelly Medium Silty Fine Sand

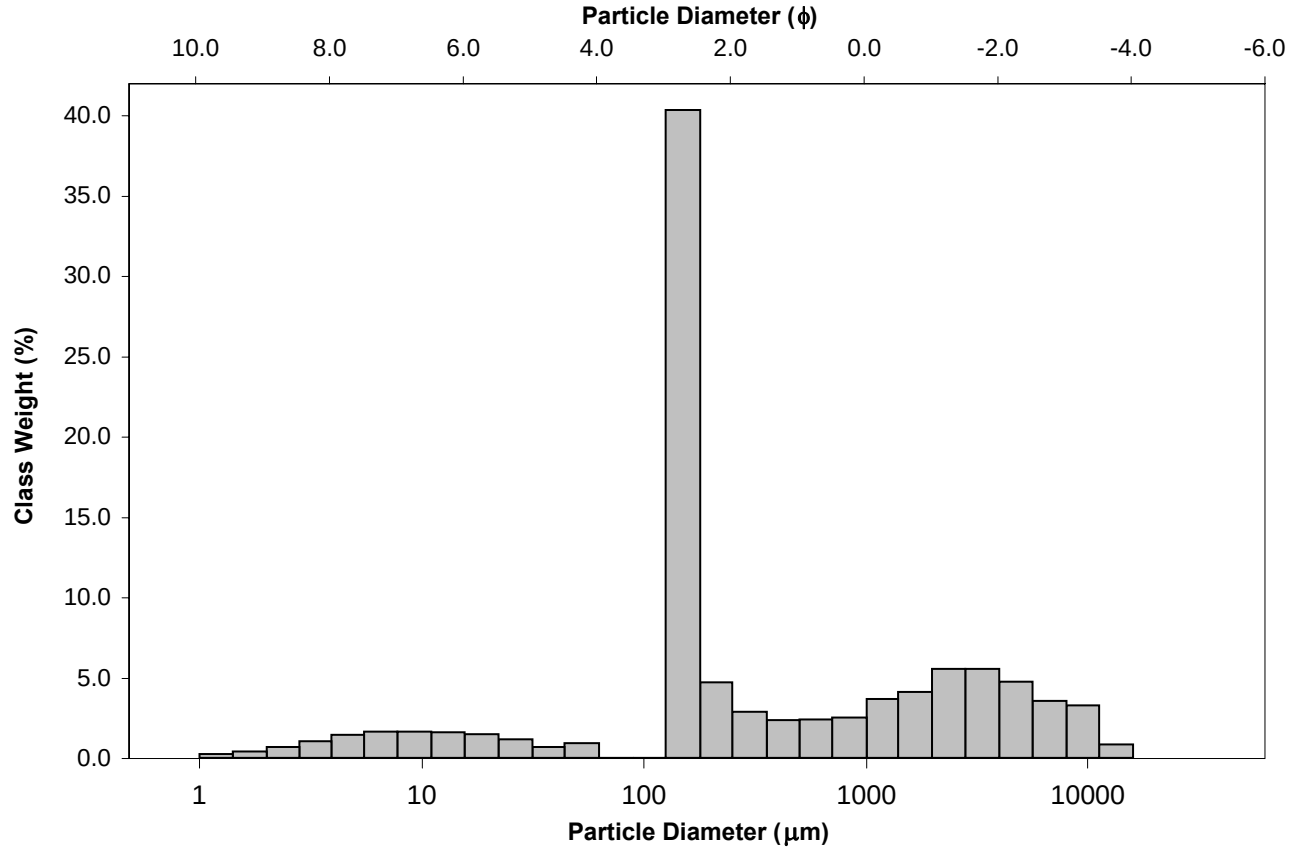
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	20.32	-2.228
MEDIAN or D_{50}:	172.5	2.536
D_{90}:	4686.4	5.621
(D_{90} / D_{10}):	230.6	-2.522
(D_{90} - D_{10}):	4666.1	7.850
(D_{75} / D_{25}):	12.24	-3.736
(D_{75} - D_{25}):	1558.5	3.614

GRAIN SIZE DISTRIBUTION

GRAVEL:	23.1%	COARSE SAND:	4.8%
SAND:	63.8%	MEDIUM SAND:	5.1%
MUD:	13.1%	FINE SAND:	46.1%
		V FINE SAND:	0.1%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	1.6%
COARSE GRAVEL:	0.0%	COARSE SILT:	2.6%
MEDIUM GRAVEL:	4.0%	MEDIUM SILT:	3.2%
FINE GRAVEL:	8.1%	FINE SILT:	3.0%
V FINE GRAVEL:	10.9%	V FINE SILT:	1.7%
V COARSE SAND:	7.7%	CLAY:	1.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	1442.8	309.2	1.693	410.7	1.284	Medium Sand
SORTING (σ):	2511.7	7.224	2.853	6.405	2.679	Very Poorly Sorted
SKEWNESS (Sk):	2.464	-0.272	0.272	0.443	-0.443	Very Coarse Skewed
KURTOSIS (K):	9.267	3.002	3.002	1.142	1.142	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_14** ANALYST & DATE: Mj.Grey, 11/23/2012

SAMPLE TYPE: Unimodal, Very Poorly Sorted TEXTURAL GROUP: Gravelly Muddy Sand

SEDIMENT NAME: Very Fine Gravelly Medium Silty Fine Sand

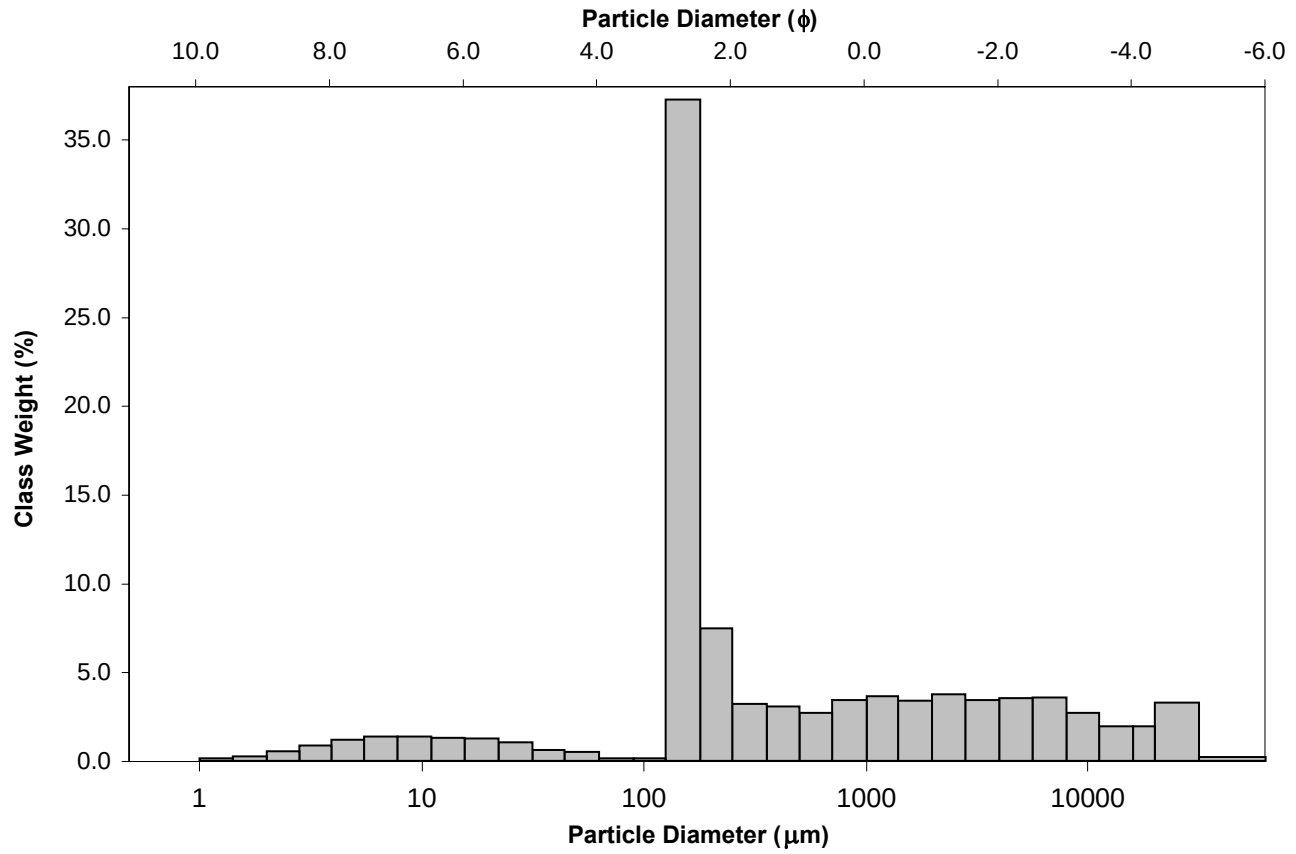
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	40.33	-3.086
MEDIAN or D_{50}:	184.7	2.437
D_{90}:	8488.5	4.632
(D_{90} / D_{10}):	210.5	-1.501
(D_{90} - D_{10}):	8448.2	7.717
(D_{75} / D_{25}):	13.27	-3.045
(D_{75} - D_{25}):	1752.5	3.731

GRAIN SIZE DISTRIBUTION

GRAVEL:	24.5%	COARSE SAND:	6.0%
SAND:	64.9%	MEDIUM SAND:	6.2%
MUD:	10.6%	FINE SAND:	45.4%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.4%	V COARSE SILT:	1.1%
COARSE GRAVEL:	5.5%	COARSE SILT:	2.3%
MEDIUM GRAVEL:	4.5%	MEDIUM SILT:	2.7%
FINE GRAVEL:	7.0%	FINE SILT:	2.6%
V FINE GRAVEL:	7.0%	V FINE SILT:	1.3%
V COARSE SAND:	6.9%	CLAY:	0.7%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	2893.8	401.3	1.317	481.8	1.053	Medium Sand
SORTING (σ):	6562.1	8.185	3.033	7.802	2.964	Very Poorly Sorted
SKEWNESS (Sk):	3.413	0.059	-0.059	0.506	-0.506	Very Coarse Skewed
KURTOSIS (K):	16.25	2.990	2.990	1.217	1.217	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_16**

ANALYST & DATE: MjGrey, 12/4/2012

SAMPLE TYPE: Polymodal, Very Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Very Fine Gravelly Fine Sand

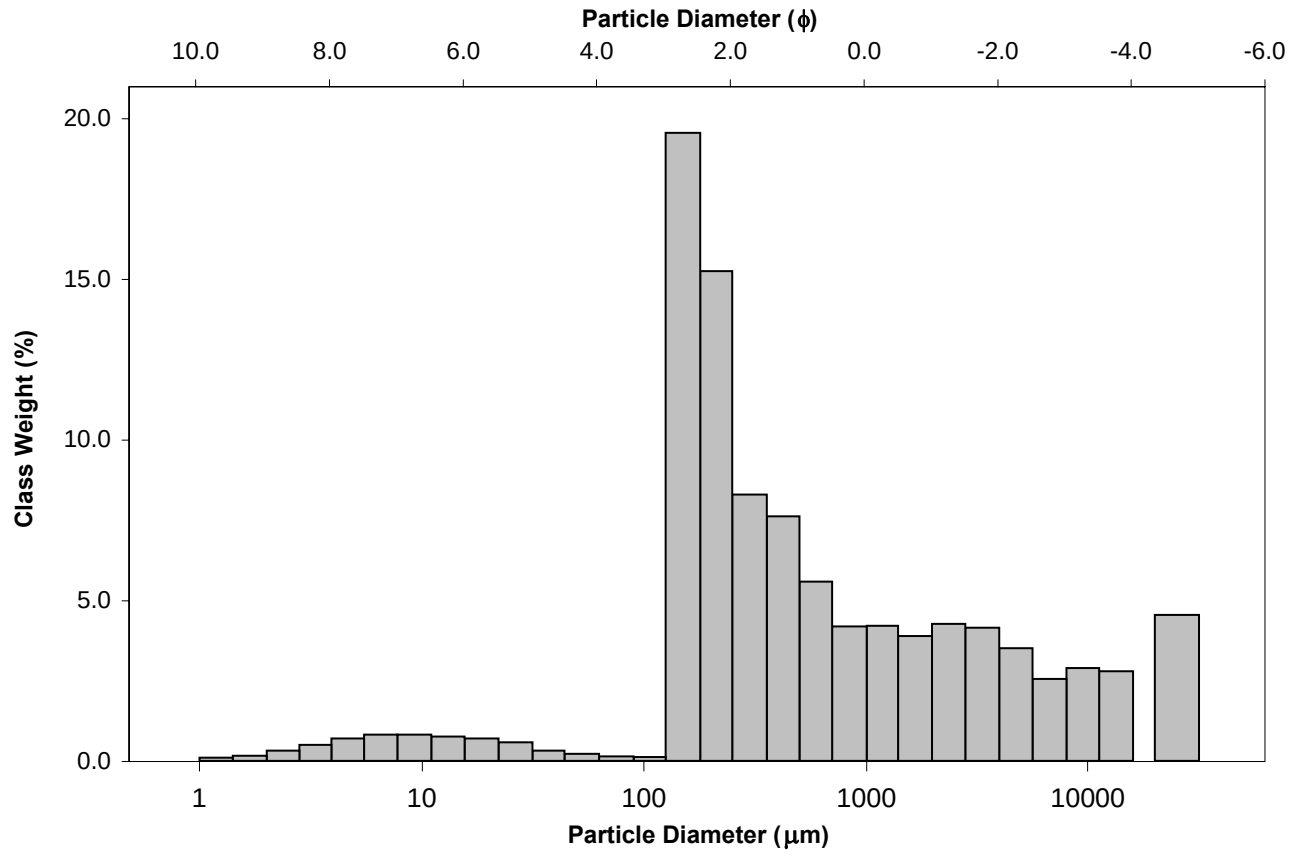
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:	25750.0	-4.650
MODE 3:	2400.0	-1.243
D_{10}:	133.5	-3.265
MEDIAN or D_{50}:	368.3	1.441
D_{90}:	9611.6	2.905
(D_{90} / D_{10}):	71.98	-0.890
(D_{90} - D_{10}):	9478.1	6.170
(D_{75} / D_{25}):	12.18	-2.309
(D_{75} - D_{25}):	1953.4	3.606

GRAIN SIZE DISTRIBUTION

GRAVEL:	25.8%	COARSE SAND:	9.6%
SAND:	68.2%	MEDIUM SAND:	15.7%
MUD:	6.0%	FINE SAND:	34.6%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.5%
COARSE GRAVEL:	5.9%	COARSE SILT:	1.3%
MEDIUM GRAVEL:	5.6%	MEDIUM SILT:	1.6%
FINE GRAVEL:	5.9%	FINE SILT:	1.5%
V FINE GRAVEL:	8.3%	V FINE SILT:	0.8%
V COARSE SAND:	8.0%	CLAY:	0.4%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	3051.3	571.7	0.807	632.9	0.660	Coarse Sand
SORTING (σ):	6362.3	6.666	2.737	6.661	2.736	Very Poorly Sorted
SKEWNESS (Sk):	2.781	0.011	-0.011	0.330	-0.330	Very Coarse Skewed
KURTOSIS (K):	9.805	3.387	3.387	1.122	1.122	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_18**

ANALYST & DATE: MjGrey, 12/4/2012

SAMPLE TYPE: Unimodal, Very Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Coarse Gravelly Fine Sand

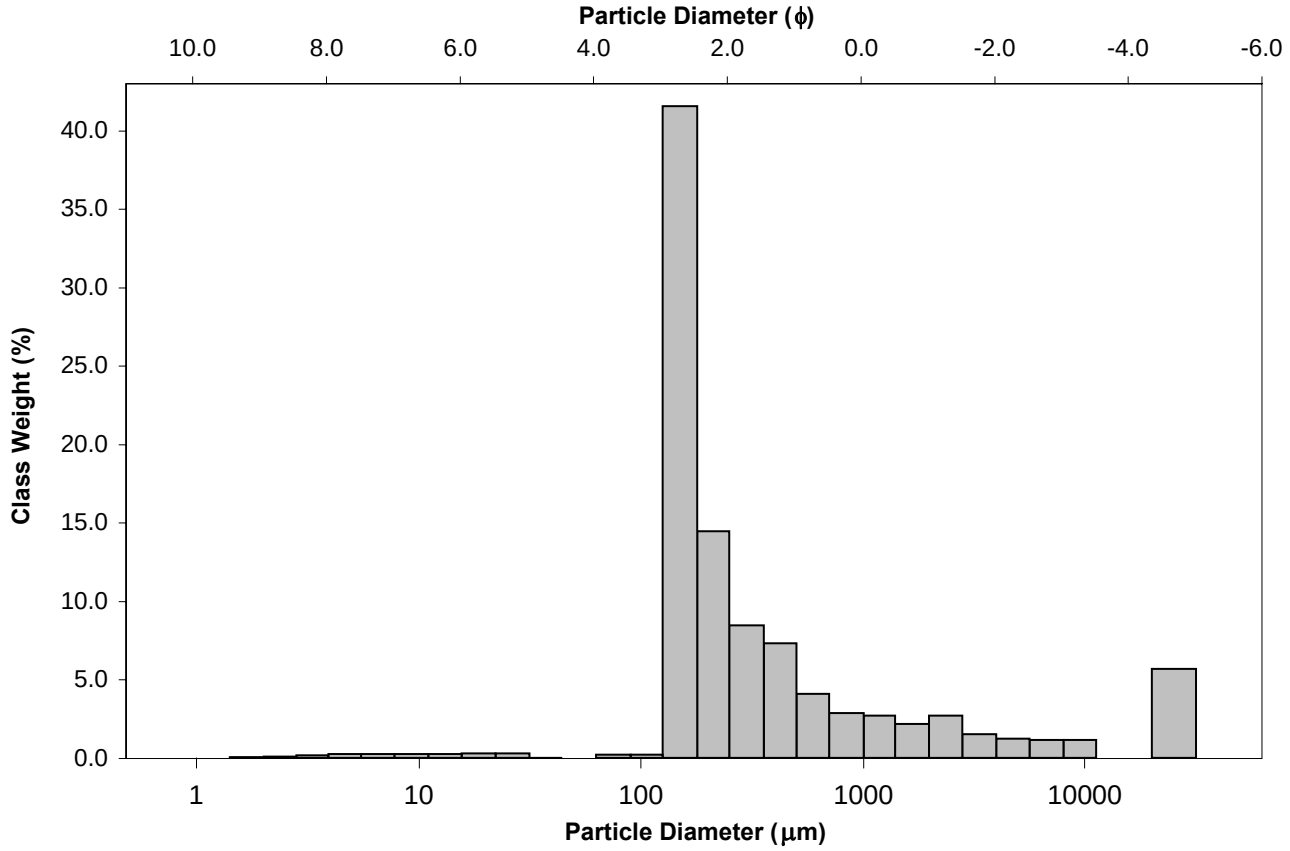
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	133.4	-2.260
MEDIAN or D_{50}:	203.6	2.297
D_{90}:	4789.4	2.906
(D_{90} / D_{10}):	35.91	-1.286
(D_{90} - D_{10}):	4656.0	5.166
(D_{75} / D_{25}):	3.681	3.236
(D_{75} - D_{25}):	406.7	1.880

GRAIN SIZE DISTRIBUTION

GRAVEL:	14.7%	COARSE SAND:	6.8%
SAND:	83.3%	MEDIUM SAND:	15.4%
MUD:	2.0%	FINE SAND:	55.9%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	7.3%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	1.0%	MEDIUM SILT:	0.5%
FINE GRAVEL:	2.3%	FINE SILT:	0.5%
V FINE GRAVEL:	4.1%	V FINE SILT:	0.3%
V COARSE SAND:	4.8%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	2487.1	386.0	1.373	359.3	1.477	Medium Sand
SORTING (σ):	6657.8	4.914	2.297	4.051	2.018	Very Poorly Sorted
SKEWNESS (Sk):	3.089	1.223	-1.223	0.759	-0.759	Very Coarse Skewed
KURTOSIS (K):	10.87	4.746	4.746	1.634	1.634	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_22** ANALYST & DATE: MjGrey, 12/4/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

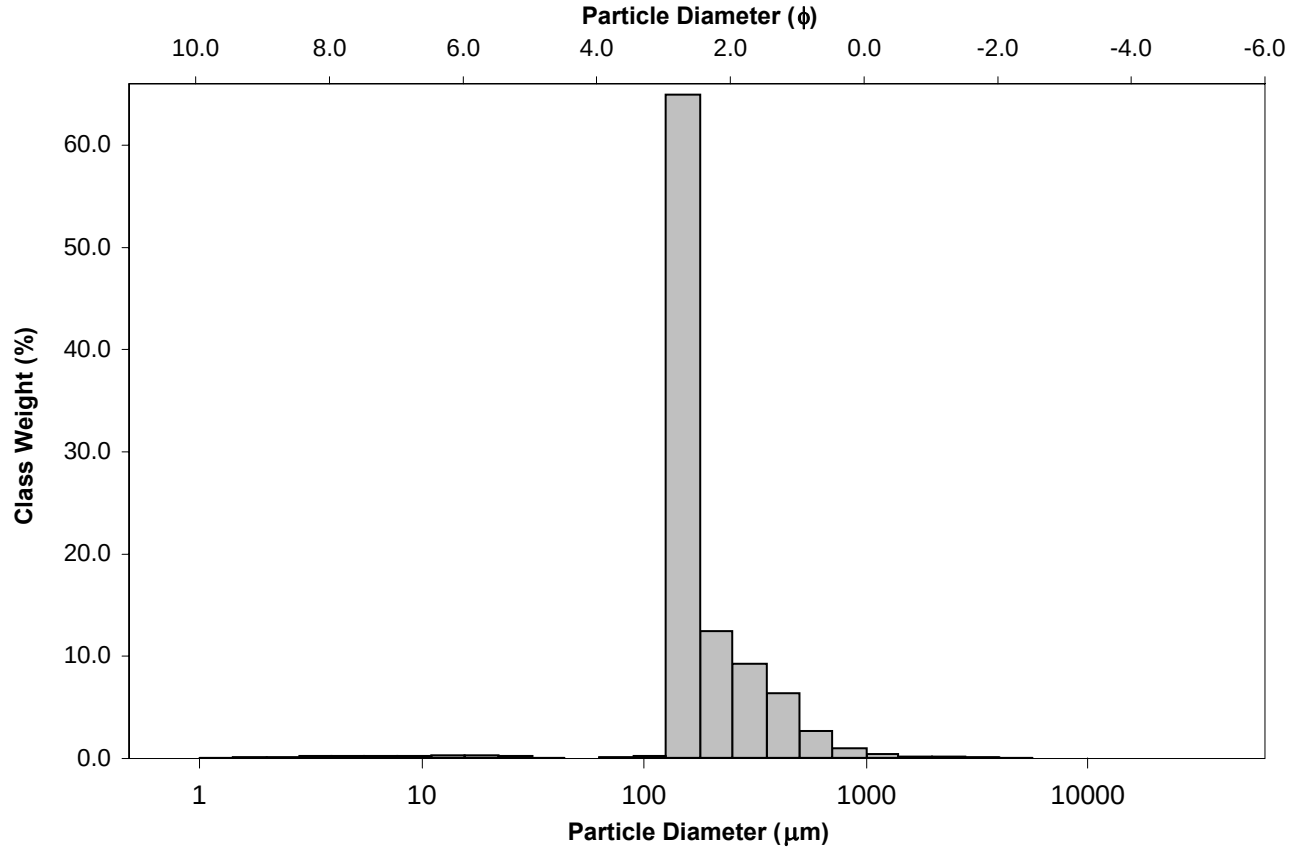
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.4	1.456
MEDIAN or D_{50}:	162.3	2.623
D_{90}:	364.6	2.939
(D_{90} / D_{10}):	2.795	2.019
(D_{90} - D_{10}):	234.2	1.483
(D_{75} / D_{25}):	1.513	1.269
(D_{75} - D_{25}):	72.66	0.598

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	3.6%
SAND:	97.9%	MEDIUM SAND:	15.3%
MUD:	1.9%	FINE SAND:	78.2%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.5%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.5%
FINE GRAVEL:	0.0%	FINE SILT:	0.5%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.3%
V COARSE SAND:	0.5%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	219.2	179.7	2.477	184.5	2.438	Fine Sand
SORTING (σ):	206.2	1.862	0.897	1.479	0.564	Moderately Well Sorted
SKEWNESS (Sk):	9.314	-1.867	1.867	0.570	-0.570	Very Coarse Skewed
KURTOSIS (K):	145.7	18.96	18.96	1.320	1.320	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_24** ANALYST & DATE: MjGrey, 12/4/2012 4:02:05 PM

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

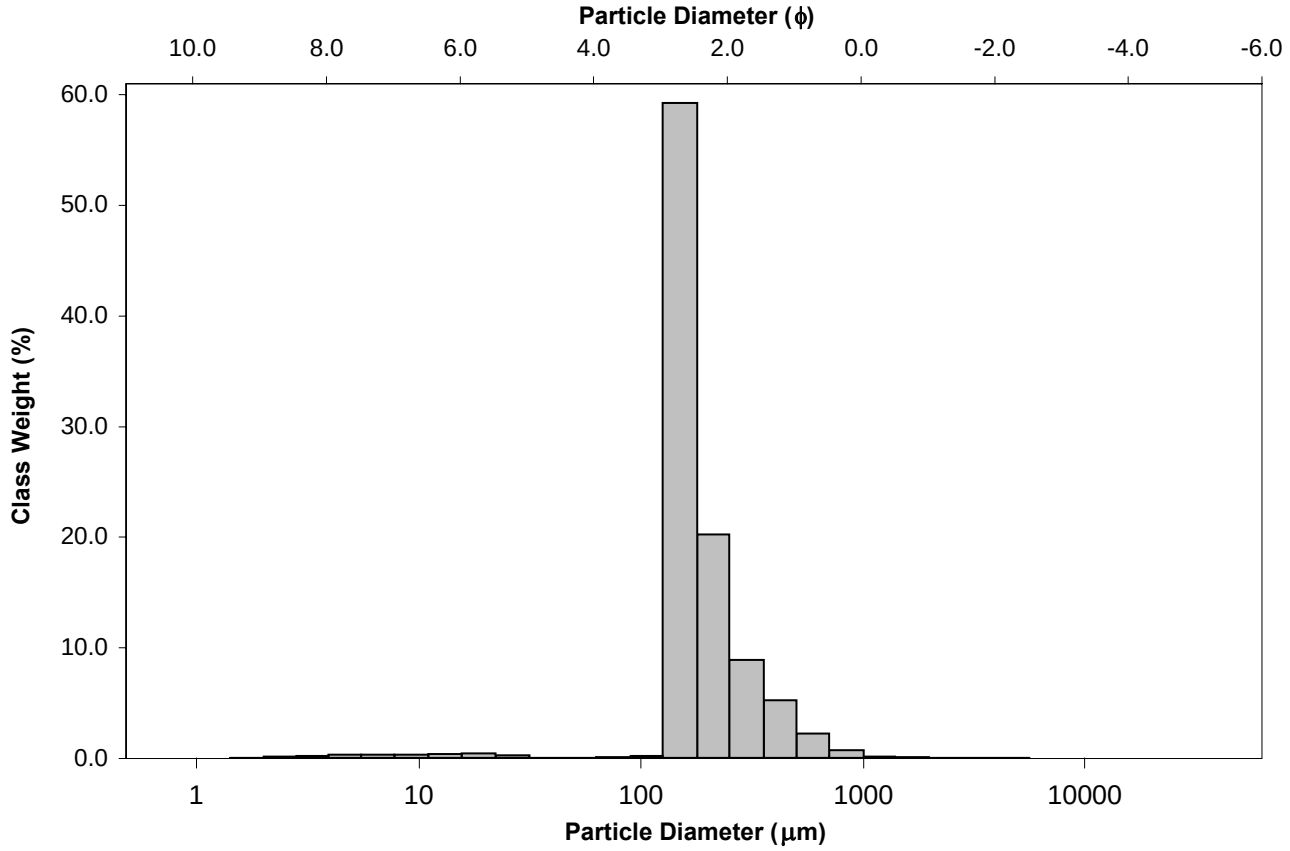
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.5	1.595
MEDIAN or D_{50}:	165.6	2.595
D_{90}:	331.1	2.938
(D_{90} / D_{10}):	2.537	1.842
(D_{90} - D_{10}):	200.6	1.343
(D_{75} / D_{25}):	1.526	1.277
(D_{75} - D_{25}):	75.06	0.610

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	2.9%
SAND:	97.4%	MEDIUM SAND:	13.9%
MUD:	2.5%	FINE SAND:	80.2%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.7%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.7%
FINE GRAVEL:	0.0%	FINE SILT:	0.6%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.4%
V COARSE SAND:	0.2%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	208.4	175.5	2.510	180.1	2.473	Fine Sand
SORTING (σ):	164.5	1.860	0.896	1.424	0.510	Moderately Well Sorted
SKEWNESS (Sk):	11.81	-2.598	2.598	0.478	-0.478	Very Coarse Skewed
KURTOSIS (K):	262.3	19.95	19.95	1.212	1.212	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_25** ANALYST & DATE: MjGrey, 12/4/2012

SAMPLE TYPE: Unimodal, Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

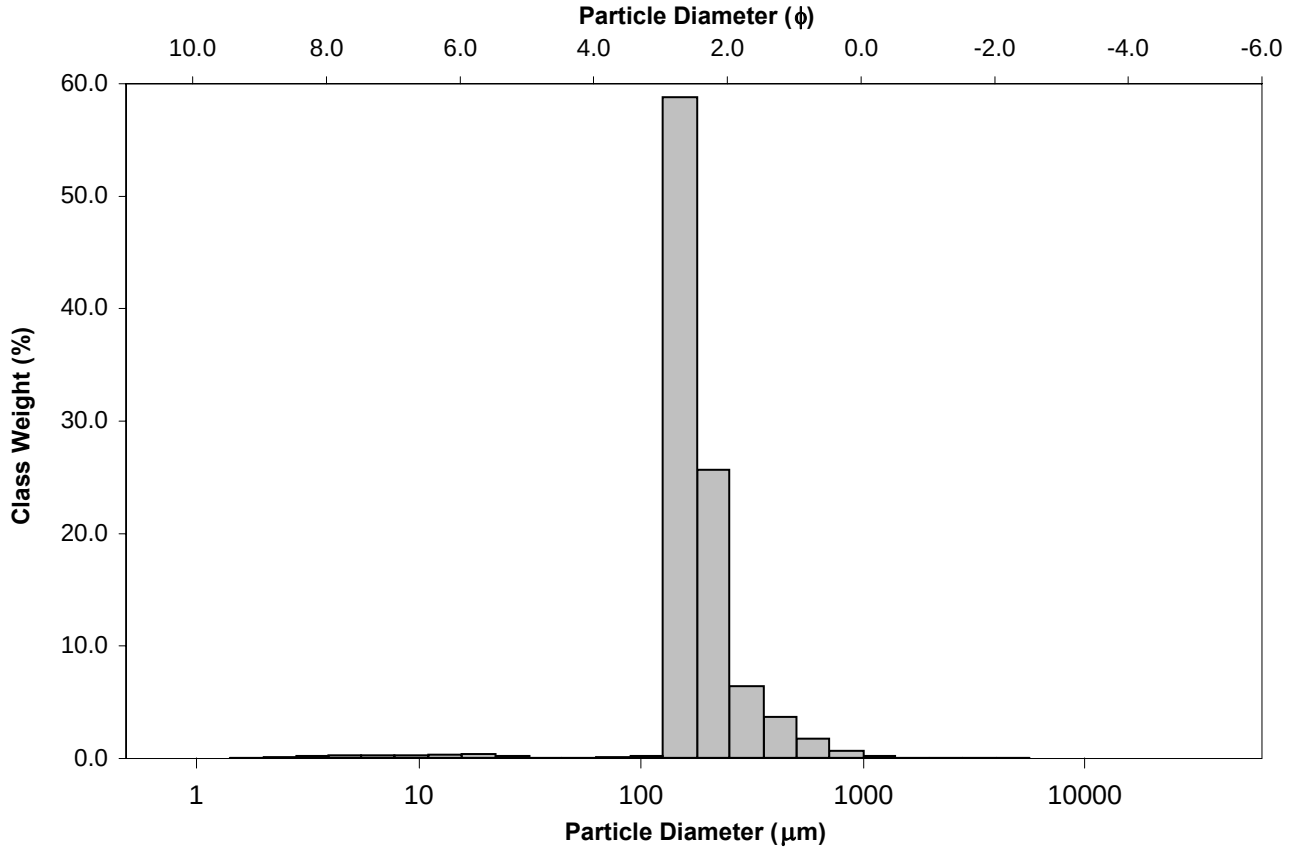
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.9	1.789
MEDIAN or D_{50}:	166.2	2.589
D_{90}:	289.3	2.934
(D_{90} / D_{10}):	2.211	1.640
(D_{90} - D_{10}):	158.4	1.145
(D_{75} / D_{25}):	1.475	1.250
(D_{75} - D_{25}):	68.00	0.561

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	2.4%
SAND:	97.8%	MEDIUM SAND:	9.9%
MUD:	2.0%	FINE SAND:	85.0%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.6%
FINE GRAVEL:	0.0%	FINE SILT:	0.5%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.3%
V COARSE SAND:	0.2%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	203.0	174.1	2.522	175.3	2.512	Fine Sand
SORTING (σ):	169.1	1.762	0.817	1.371	0.456	Well Sorted
SKEWNESS (Sk):	13.86	-2.671	2.671	0.407	-0.407	Very Coarse Skewed
KURTOSIS (K):	310.9	23.67	23.67	1.214	1.214	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_26** ANALYST & DATE: MjGrey, 12/4/2012

SAMPLE TYPE: Unimodal, Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

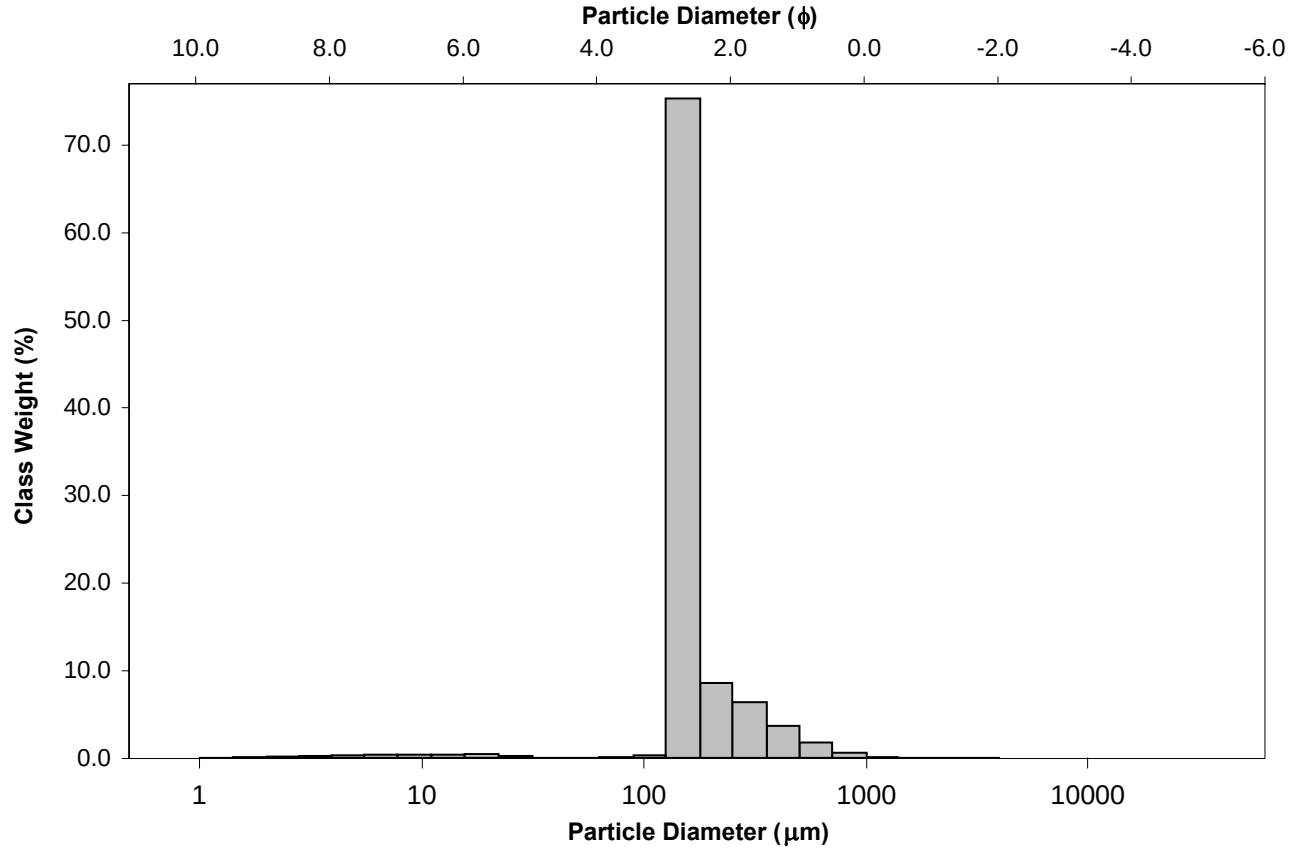
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	129.2	1.818
MEDIAN or D_{50}:	156.2	2.679
D_{90}:	283.7	2.953
(D_{90} / D_{10}):	2.196	1.624
(D_{90} - D_{10}):	154.5	1.135
(D_{75} / D_{25}):	1.268	1.137
(D_{75} - D_{25}):	37.17	0.343

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	2.3%
SAND:	97.2%	MEDIUM SAND:	9.7%
MUD:	2.7%	FINE SAND:	84.7%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.7%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.8%
FINE GRAVEL:	0.0%	FINE SILT:	0.7%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.4%
V COARSE SAND:	0.2%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	188.4	160.4	2.640	164.3	2.606	Fine Sand
SORTING (σ):	137.5	1.842	0.881	1.338	0.420	Well Sorted
SKEWNESS (Sk):	9.421	-2.931	2.931	0.472	-0.472	Very Coarse Skewed
KURTOSIS (K):	167.4	22.01	22.01	1.962	1.962	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_27**

ANALYST & DATE: MjGrey, 12/4/2012

SAMPLE TYPE: Unimodal, Very Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

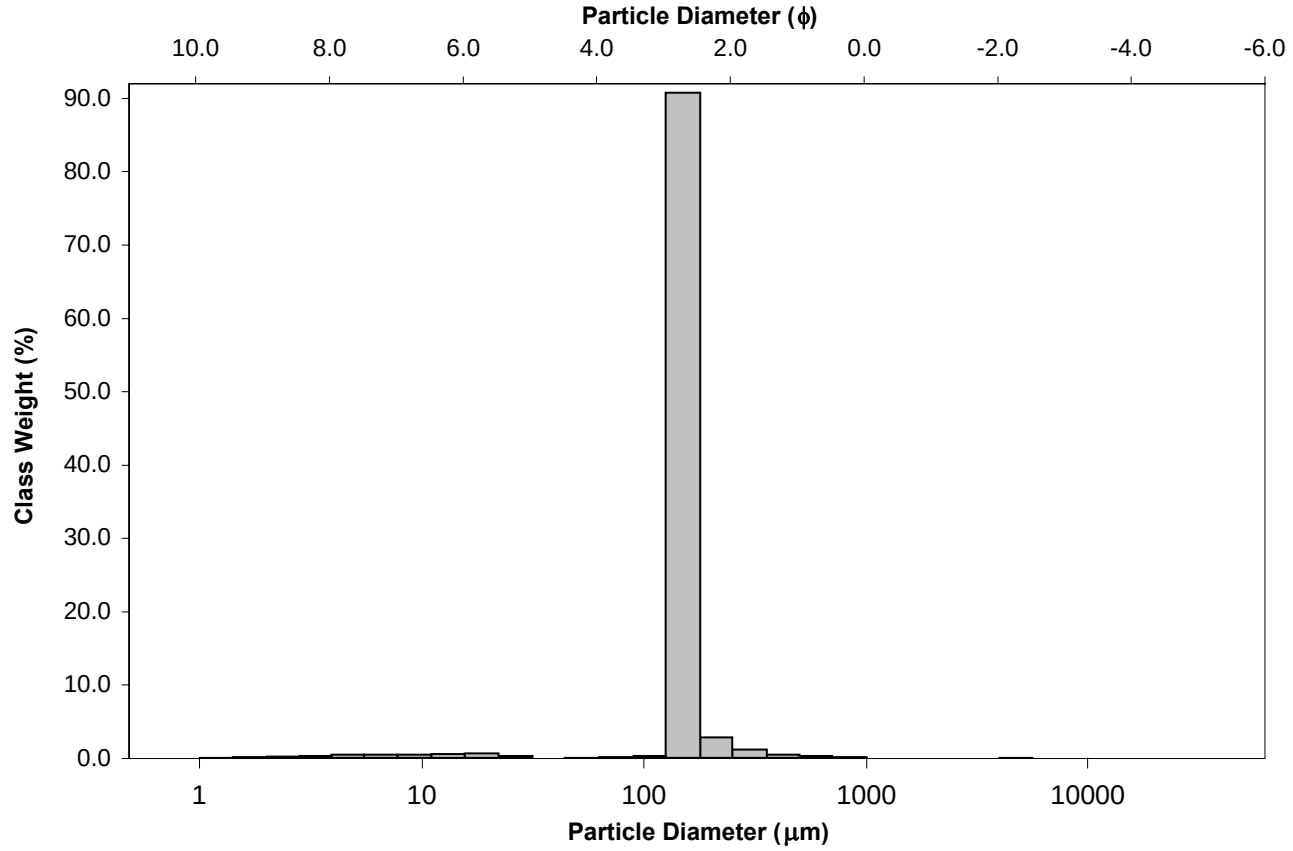
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	128.1	2.505
MEDIAN or D_{50}:	150.2	2.735
D_{90}:	176.1	2.964
(D_{90} / D_{10}):	1.375	1.183
(D_{90} - D_{10}):	48.00	0.459
(D_{75} / D_{25}):	1.220	1.111
(D_{75} - D_{25}):	29.92	0.287

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.4%
SAND:	96.6%	MEDIUM SAND:	1.6%
MUD:	3.4%	FINE SAND:	94.2%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.9%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	1.0%
FINE GRAVEL:	0.1%	FINE SILT:	0.9%
V FINE GRAVEL:	0.0%	V FINE SILT:	0.5%
V COARSE SAND:	0.0%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	156.6	139.9	2.838	150.2	2.735	Fine Sand
SORTING (σ):	119.6	1.762	0.818	1.130	0.176	Very Well Sorted
SKEWNESS (Sk):	32.39	-4.661	4.661	0.000	0.000	Symmetrical
KURTOSIS (K):	1245.0	30.33	30.33	0.738	0.738	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_29** ANALYST & DATE: MjGrey, 12/4/2012

SAMPLE TYPE: Unimodal, Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

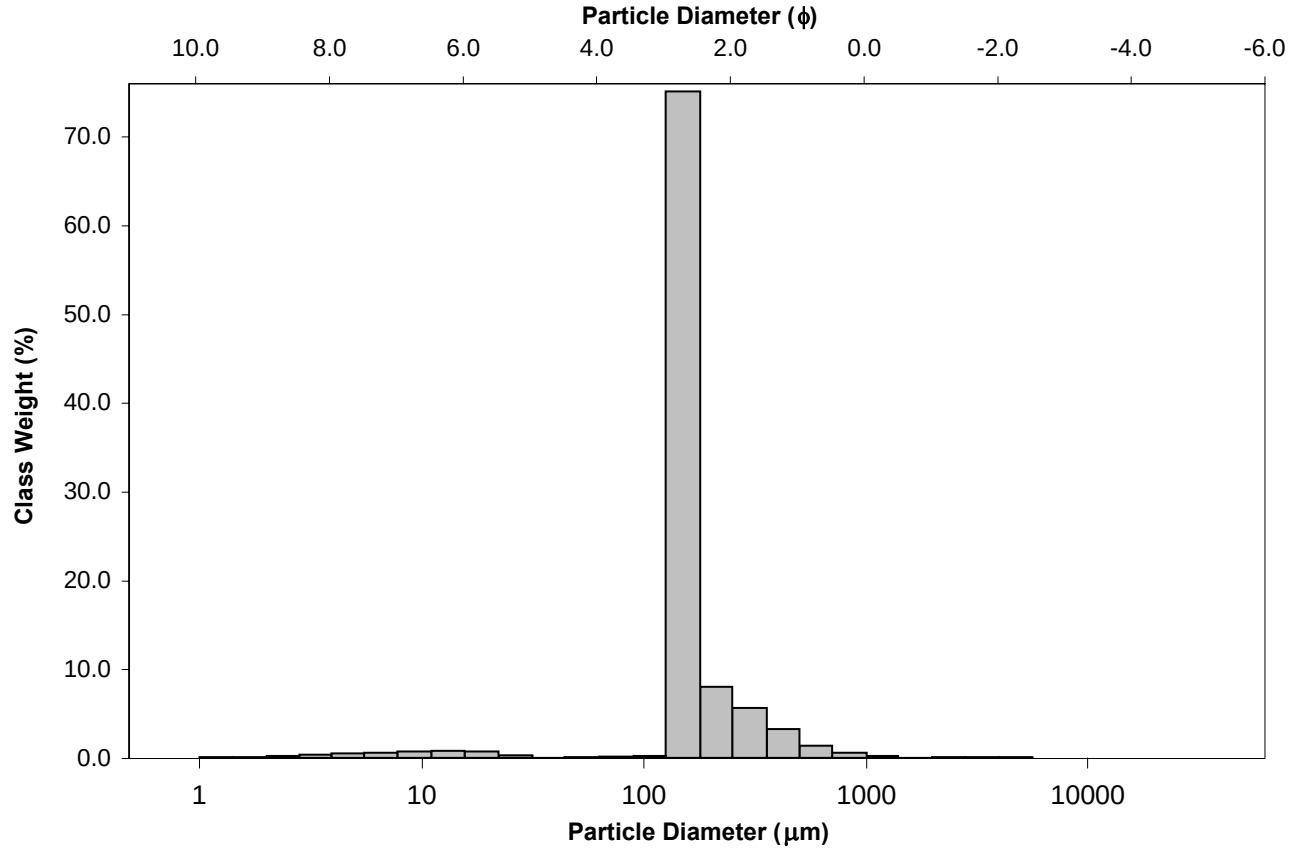
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	128.0	1.897
MEDIAN or D_{50}:	154.9	2.691
D_{90}:	268.6	2.965
(D_{90} / D_{10}):	2.098	1.563
(D_{90} - D_{10}):	140.5	1.069
(D_{75} / D_{25}):	1.269	1.136
(D_{75} - D_{25}):	36.97	0.344

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.3%	COARSE SAND:	1.9%
SAND:	95.2%	MEDIUM SAND:	8.6%
MUD:	4.5%	FINE SAND:	83.9%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.1%
COARSE GRAVEL:	0.0%	COARSE SILT:	1.0%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	1.4%
FINE GRAVEL:	0.1%	FINE SILT:	1.2%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.6%
V COARSE SAND:	0.3%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	189.2	150.6	2.731	160.1	2.643	Fine Sand
SORTING (σ):	207.2	2.123	1.086	1.315	0.395	Well Sorted
SKEWNESS (Sk):	13.41	-2.798	2.798	0.424	-0.424	Very Coarse Skewed
KURTOSIS (K):	249.8	17.27	17.27	1.913	1.913	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_31**

ANALYST & DATE: MjGrey, 12/4/2012

SAMPLE TYPE: Unimodal, Very Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

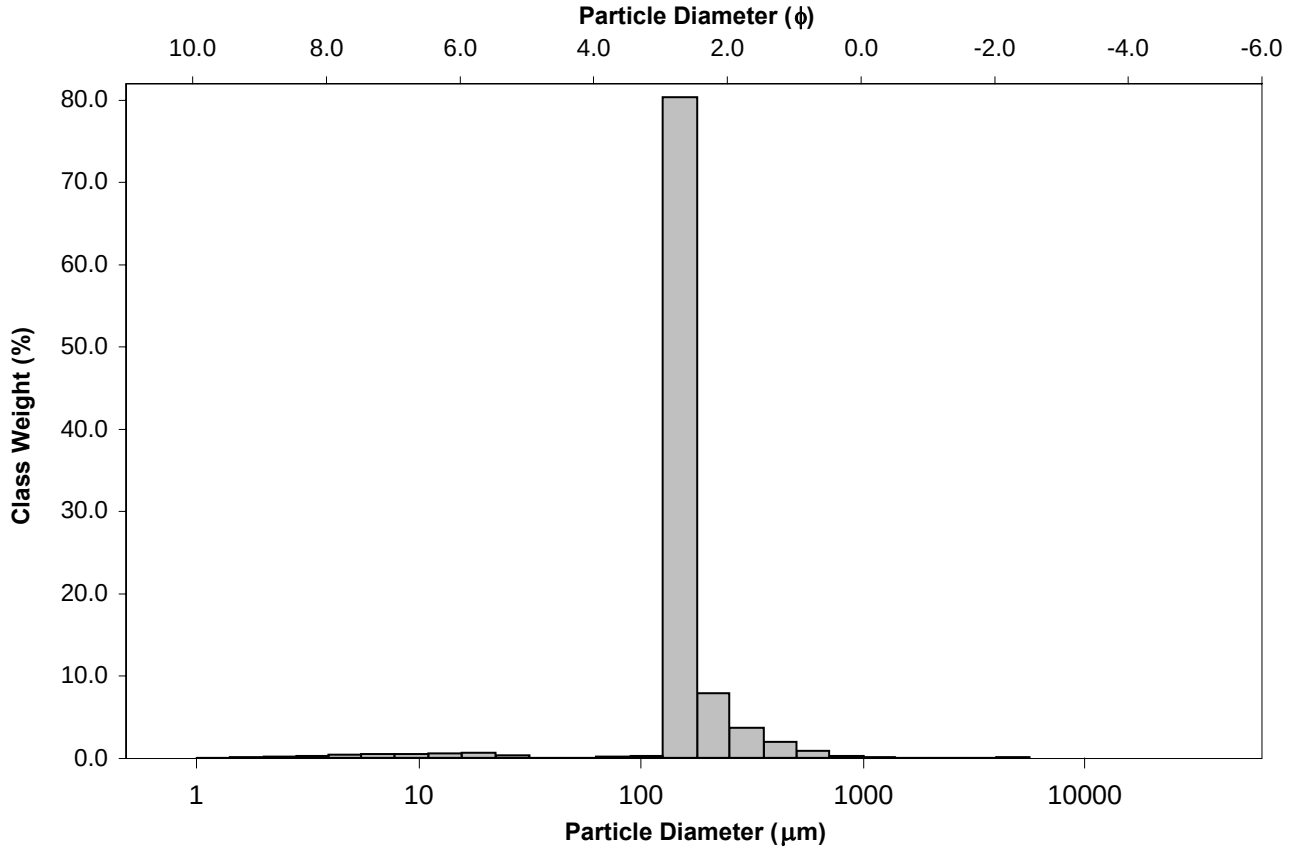
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	128.3	2.204
MEDIAN or D_{50}:	153.4	2.705
D_{90}:	217.0	2.963
(D_{90} / D_{10}):	1.692	1.344
(D_{90} - D_{10}):	88.74	0.759
(D_{75} / D_{25}):	1.250	1.127
(D_{75} - D_{25}):	34.31	0.322

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	1.1%
SAND:	96.1%	MEDIUM SAND:	5.5%
MUD:	3.7%	FINE SAND:	88.9%
		V FINE SAND:	0.5%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.9%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	1.1%
FINE GRAVEL:	0.1%	FINE SILT:	0.9%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.5%
V COARSE SAND:	0.1%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	174.8	147.4	2.762	153.4	2.705	Fine Sand
SORTING (σ):	172.4	1.926	0.945	1.231	0.300	Very Well Sorted
SKEWNESS (Sk):	18.57	-3.481	3.481	0.270	-0.270	Coarse Skewed
KURTOSIS (K):	451.1	23.16	23.16	1.602	1.602	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_32** ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

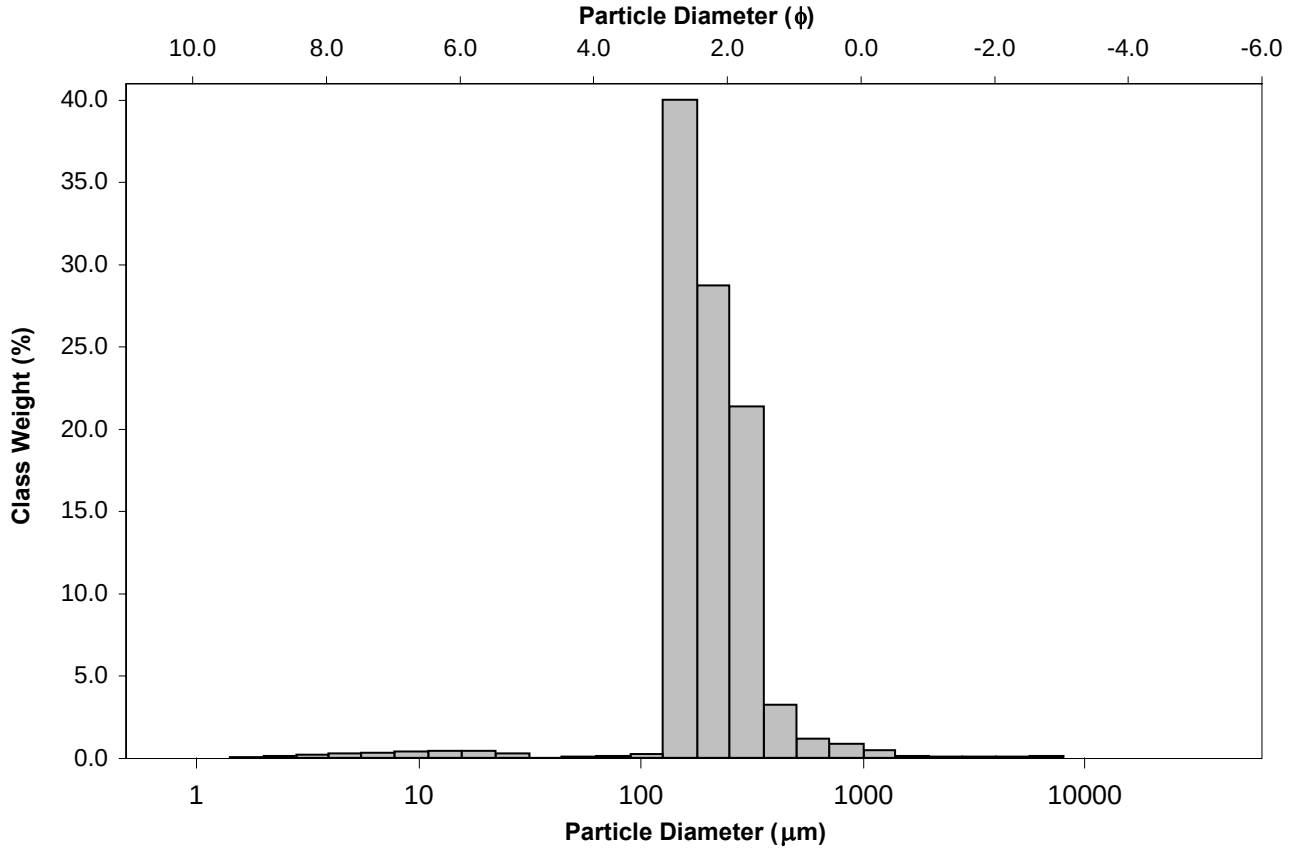
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	132.8	1.579
MEDIAN or D_{50}:	191.3	2.386
D_{90}:	334.7	2.913
(D_{90} / D_{10}):	2.520	1.845
(D_{90} - D_{10}):	201.9	1.334
(D_{75} / D_{25}):	1.733	1.411
(D_{75} - D_{25}):	110.9	0.793

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.5%	COARSE SAND:	2.1%
SAND:	96.9%	MEDIUM SAND:	24.7%
MUD:	2.7%	FINE SAND:	69.0%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.1%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.7%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.8%
FINE GRAVEL:	0.3%	FINE SILT:	0.6%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.3%
V COARSE SAND:	0.6%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	246.6	194.9	2.359	201.0	2.314	Fine Sand
SORTING (σ):	350.8	1.950	0.963	1.450	0.536	Moderately Well Sorted
SKEWNESS (Sk):	13.52	-2.043	2.043	0.249	-0.249	Coarse Skewed
KURTOSIS (K):	223.6	18.61	18.61	0.876	0.876	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_35** ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

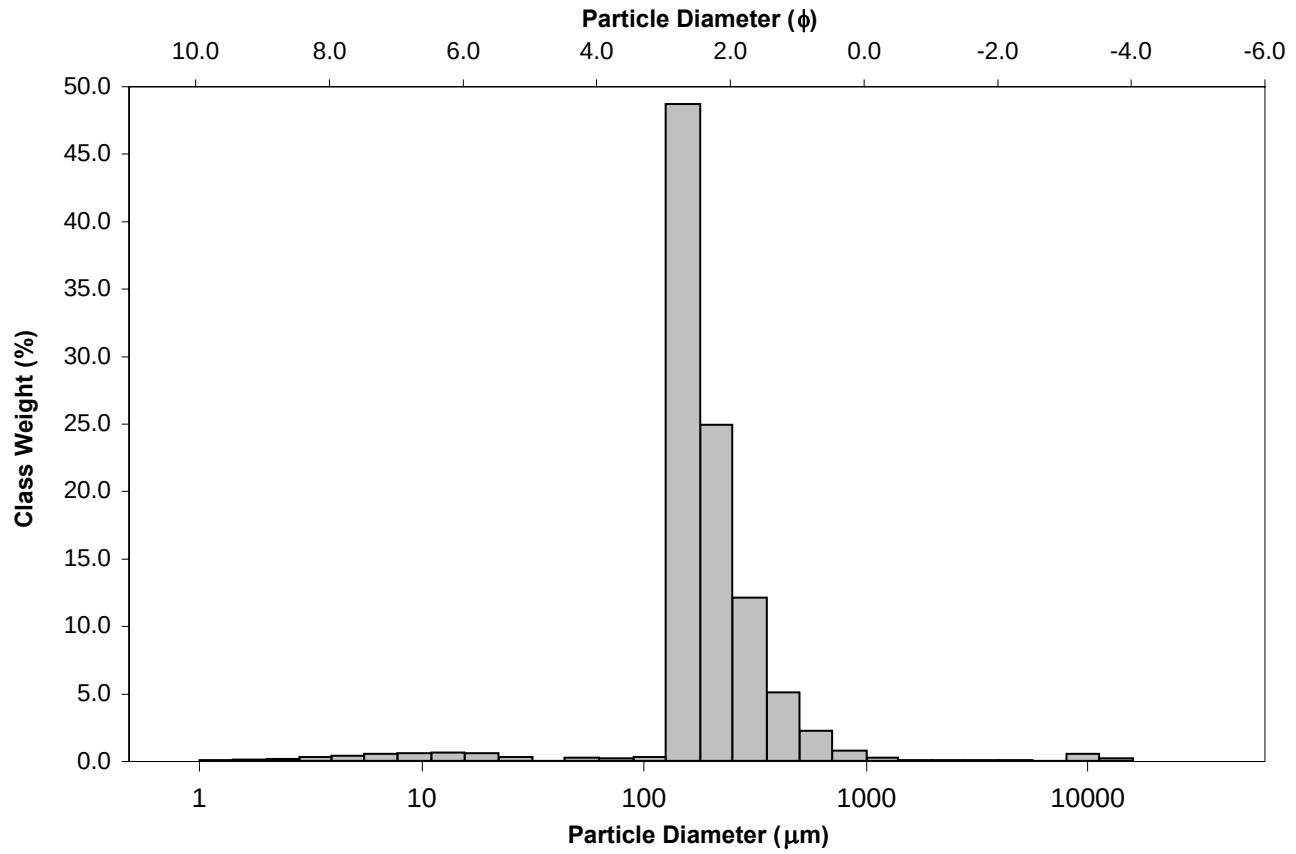
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.1	1.524
MEDIAN or D_{50}:	173.4	2.527
D_{90}:	347.8	2.942
(D_{90} / D_{10}):	2.673	1.931
(D_{90} - D_{10}):	217.7	1.419
(D_{75} / D_{25}):	1.641	1.345
(D_{75} - D_{25}):	92.92	0.715

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.9%	COARSE SAND:	3.0%
SAND:	95.1%	MEDIUM SAND:	17.1%
MUD:	3.9%	FINE SAND:	74.1%
		V FINE SAND:	0.5%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.9%
MEDIUM GRAVEL:	0.7%	MEDIUM SILT:	1.2%
FINE GRAVEL:	0.1%	FINE SILT:	0.9%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.5%
V COARSE SAND:	0.3%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	298.4	182.3	2.455	190.3	2.394	Fine Sand
SORTING (σ):	942.2	2.259	1.176	1.483	0.569	Moderately Well Sorted
SKEWNESS (Sk):	11.36	-1.111	1.111	0.439	-0.439	Very Coarse Skewed
KURTOSIS (K):	138.8	15.85	15.85	1.105	1.105	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_37**

ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Bimodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Medium Gravelly Fine Sand

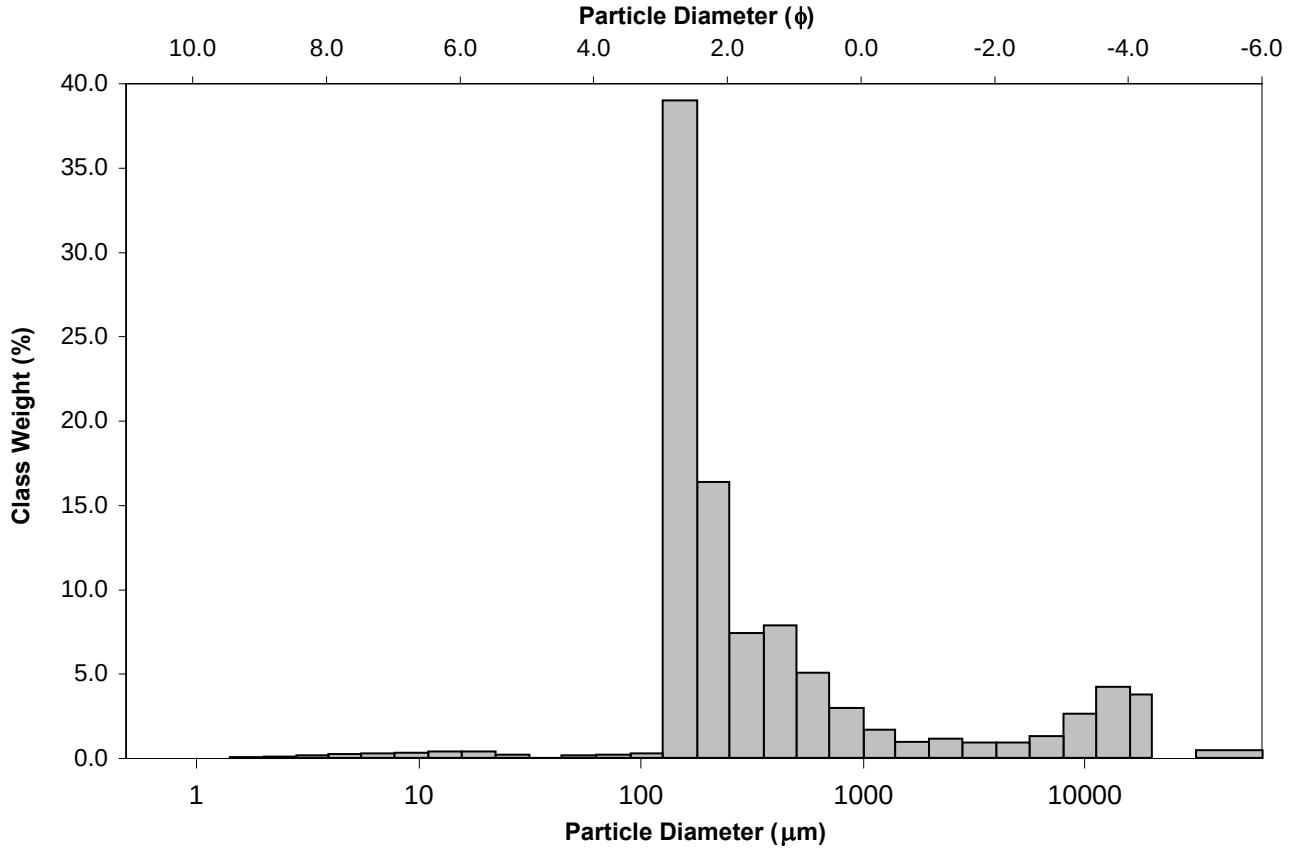
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:	427.5	1.247
MODE 3:		
D_{10}:	133.2	-3.045
MEDIAN or D_{50}:	204.8	2.287
D_{90}:	8254.4	2.908
(D_{90} / D_{10}):	61.97	-0.955
(D_{90} - D_{10}):	8121.3	5.954
(D_{75} / D_{25}):	3.353	2.799
(D_{75} - D_{25}):	358.2	1.746

GRAIN SIZE DISTRIBUTION

GRAVEL:	14.6%	COARSE SAND:	8.1%
SAND:	83.0%	MEDIUM SAND:	15.3%
MUD:	2.4%	FINE SAND:	56.6%
		V FINE SAND:	0.5%
V COARSE GRAVEL:	0.9%	V COARSE SILT:	0.2%
COARSE GRAVEL:	2.5%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	6.9%	MEDIUM SILT:	0.7%
FINE GRAVEL:	2.3%	FINE SILT:	0.6%
V FINE GRAVEL:	2.1%	V FINE SILT:	0.3%
V COARSE SAND:	2.7%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	2146.1	373.1	1.422	333.1	1.586	Medium Sand
SORTING (σ):	5937.0	4.794	2.261	3.543	1.825	Poorly Sorted
SKEWNESS (Sk):	4.822	1.130	-1.130	0.729	-0.729	Very Coarse Skewed
KURTOSIS (K):	32.43	4.562	4.562	1.591	1.591	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_39** ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

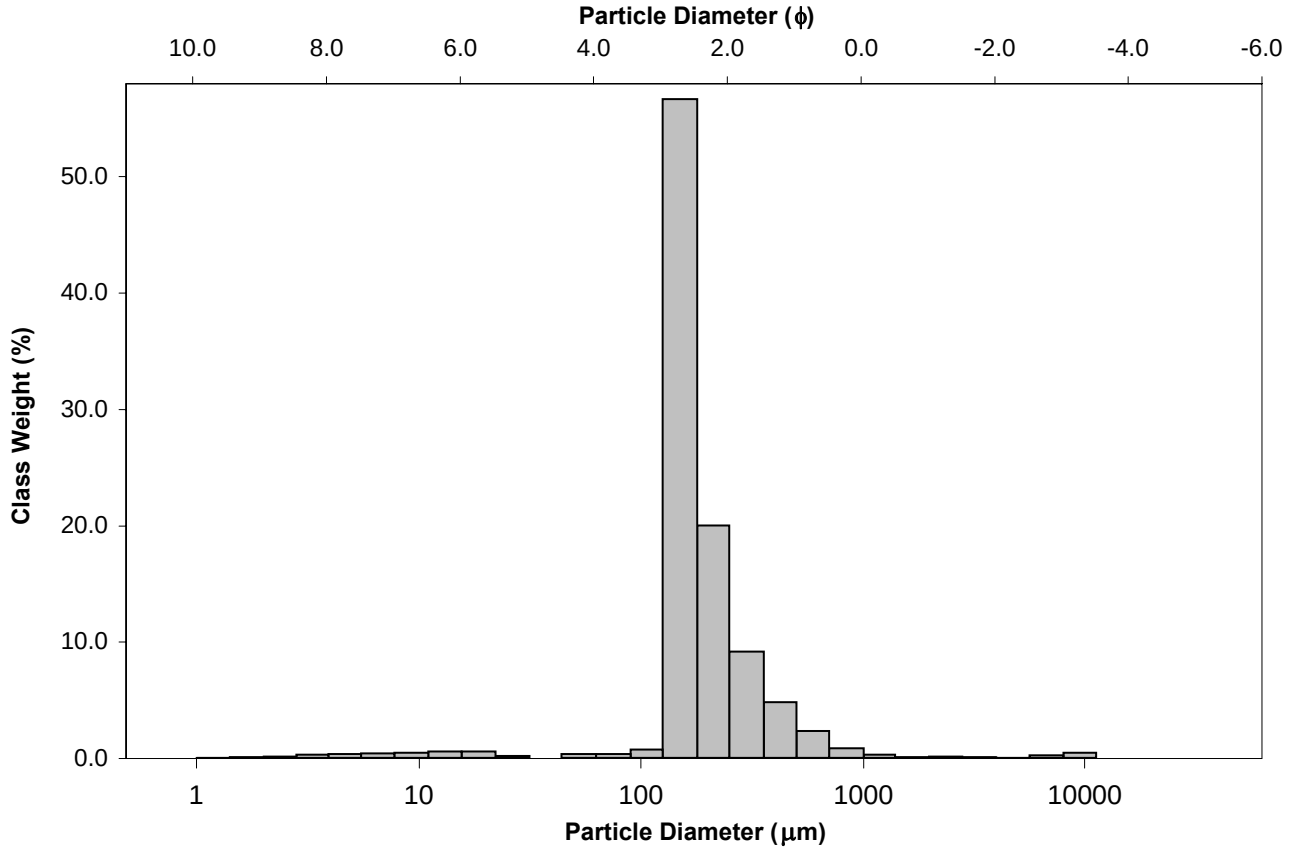
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	129.4	1.543
MEDIAN or D_{50}:	165.9	2.592
D_{90}:	343.3	2.950
(D_{90} / D_{10}):	2.653	1.913
(D_{90} - D_{10}):	213.9	1.408
(D_{75} / D_{25}):	1.562	1.296
(D_{75} - D_{25}):	79.84	0.644

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.9%	COARSE SAND:	3.2%
SAND:	95.6%	MEDIUM SAND:	13.7%
MUD:	3.4%	FINE SAND:	77.3%
		V FINE SAND:	1.0%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.7%
MEDIUM GRAVEL:	0.5%	MEDIUM SILT:	1.0%
FINE GRAVEL:	0.3%	FINE SILT:	0.8%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.4%
V COARSE SAND:	0.4%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	273.2	177.5	2.494	182.4	2.455	Fine Sand
SORTING (σ):	744.9	2.151	1.105	1.463	0.549	Moderately Well Sorted
SKEWNESS (Sk):	11.05	-0.957	0.957	0.493	-0.493	Very Coarse Skewed
KURTOSIS (K):	130.9	16.29	16.29	1.236	1.236	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_40** ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

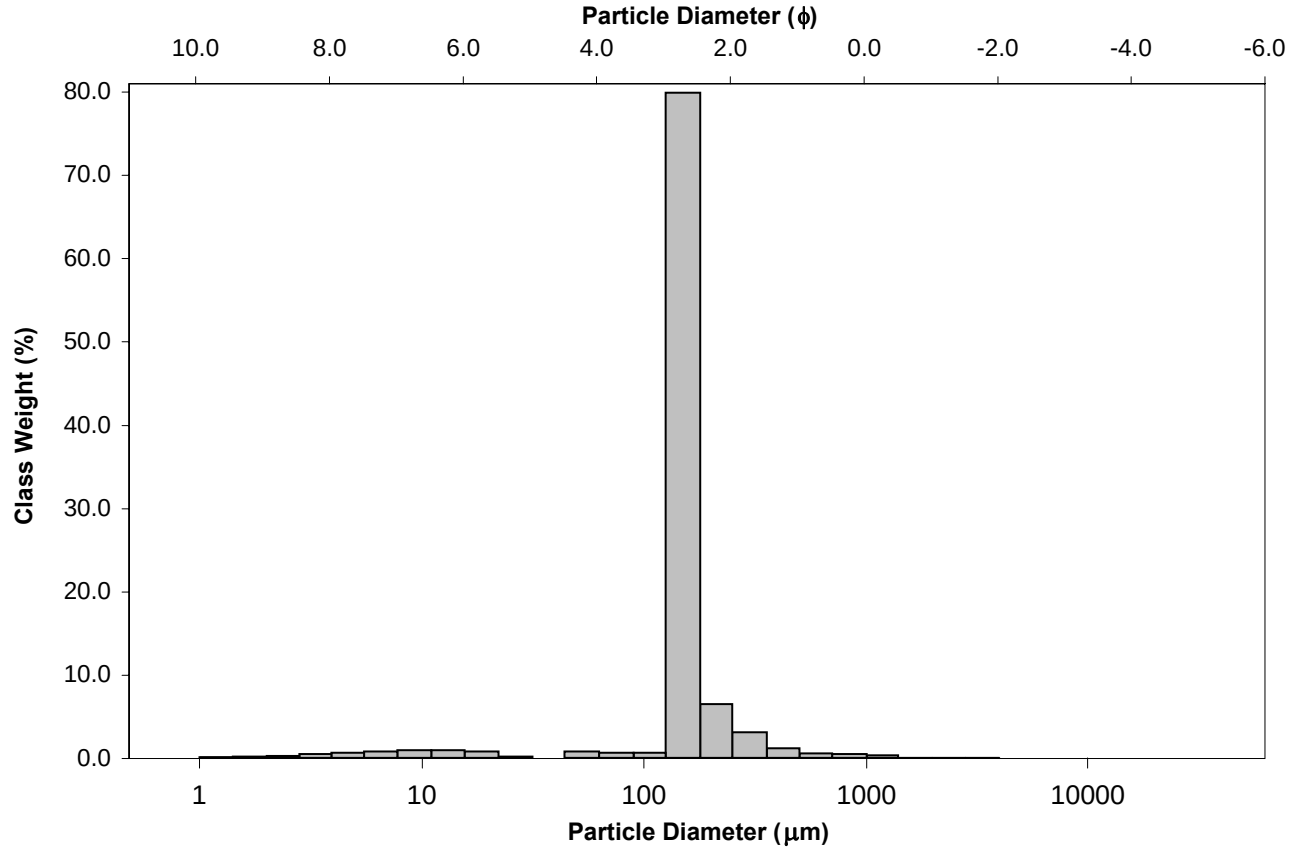
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	126.5	2.349
MEDIAN or D_{50}:	151.4	2.723
D_{90}:	196.3	2.983
(D_{90} / D_{10}):	1.552	1.270
(D_{90} - D_{10}):	69.80	0.634
(D_{75} / D_{25}):	1.252	1.127
(D_{75} - D_{25}):	34.11	0.324

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	1.1%
SAND:	93.9%	MEDIUM SAND:	4.1%
MUD:	6.0%	FINE SAND:	87.1%
		V FINE SAND:	1.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.8%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.9%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	1.8%
FINE GRAVEL:	0.0%	FINE SILT:	1.4%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.7%
V COARSE SAND:	0.4%	CLAY:	0.4%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	166.7	136.4	2.874	151.4	2.723	Fine Sand
SORTING (σ):	126.6	2.173	1.120	1.578	0.658	Moderately Well Sorted
SKEWNESS (Sk):	10.86	-3.270	3.270	-0.272	0.272	Fine Skewed
KURTOSIS (K):	201.7	17.33	17.33	4.569	4.569	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_42**

ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Bimodal, Moderately Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

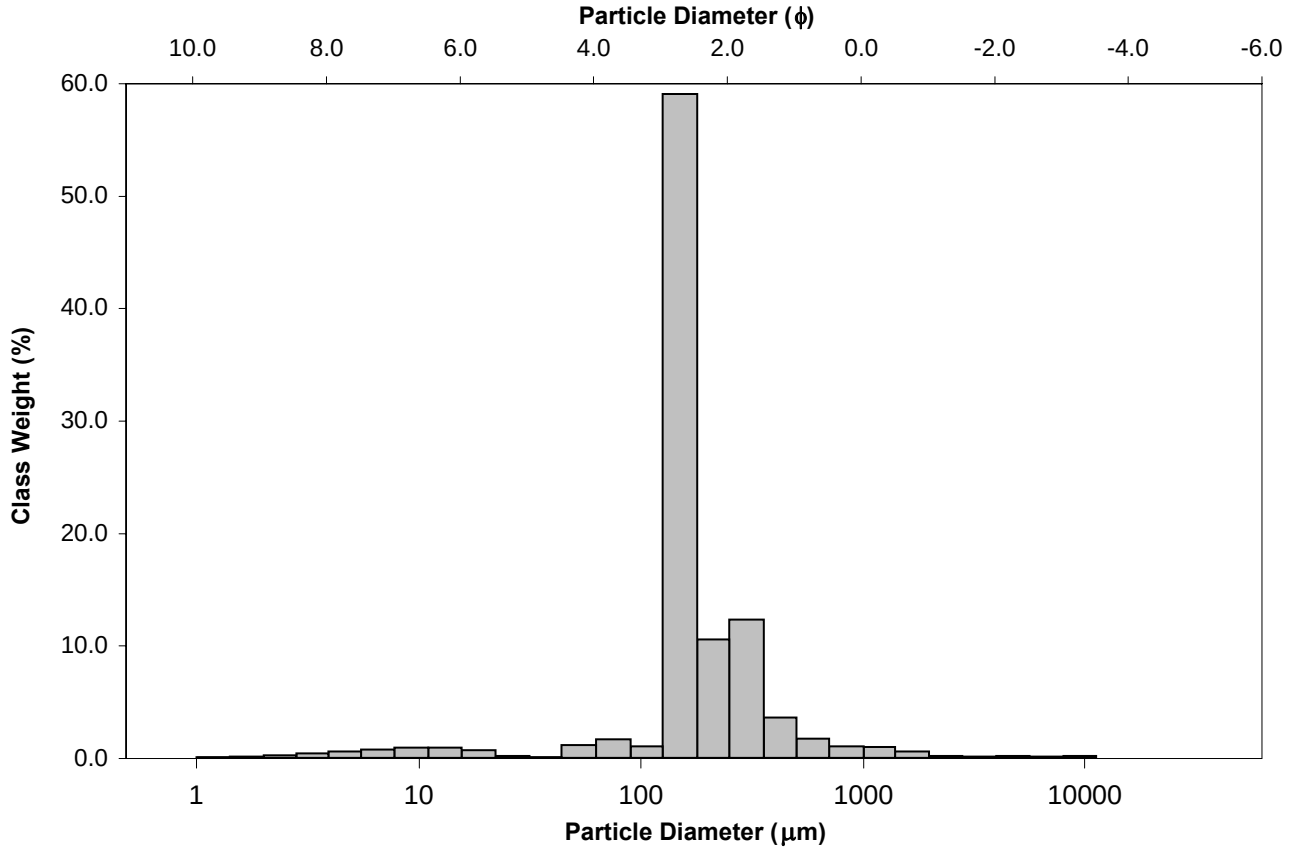
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:	302.5	1.747
MODE 3:		
D_{10}:	125.9	1.554
MEDIAN or D_{50}:	160.1	2.643
D_{90}:	340.7	2.990
(D_{90} / D_{10}):	2.706	1.924
(D_{90} - D_{10}):	214.8	1.436
(D_{75} / D_{25}):	1.572	1.296
(D_{75} - D_{25}):	78.78	0.652

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.9%	COARSE SAND:	2.7%
SAND:	93.0%	MEDIUM SAND:	15.7%
MUD:	6.2%	FINE SAND:	70.5%
		V FINE SAND:	2.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	1.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.2%	MEDIUM SILT:	1.8%
FINE GRAVEL:	0.3%	FINE SILT:	1.3%
V FINE GRAVEL:	0.3%	V FINE SILT:	0.6%
V COARSE SAND:	1.5%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	254.6	162.5	2.621	181.6	2.461	Fine Sand
SORTING (σ):	568.8	2.498	1.321	1.762	0.817	Moderately Sorted
SKEWNESS (Sk):	11.86	-1.491	1.491	0.212	-0.212	Coarse Skewed
KURTOSIS (K):	170.2	11.71	11.71	2.212	2.212	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_43**

ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Moderately Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

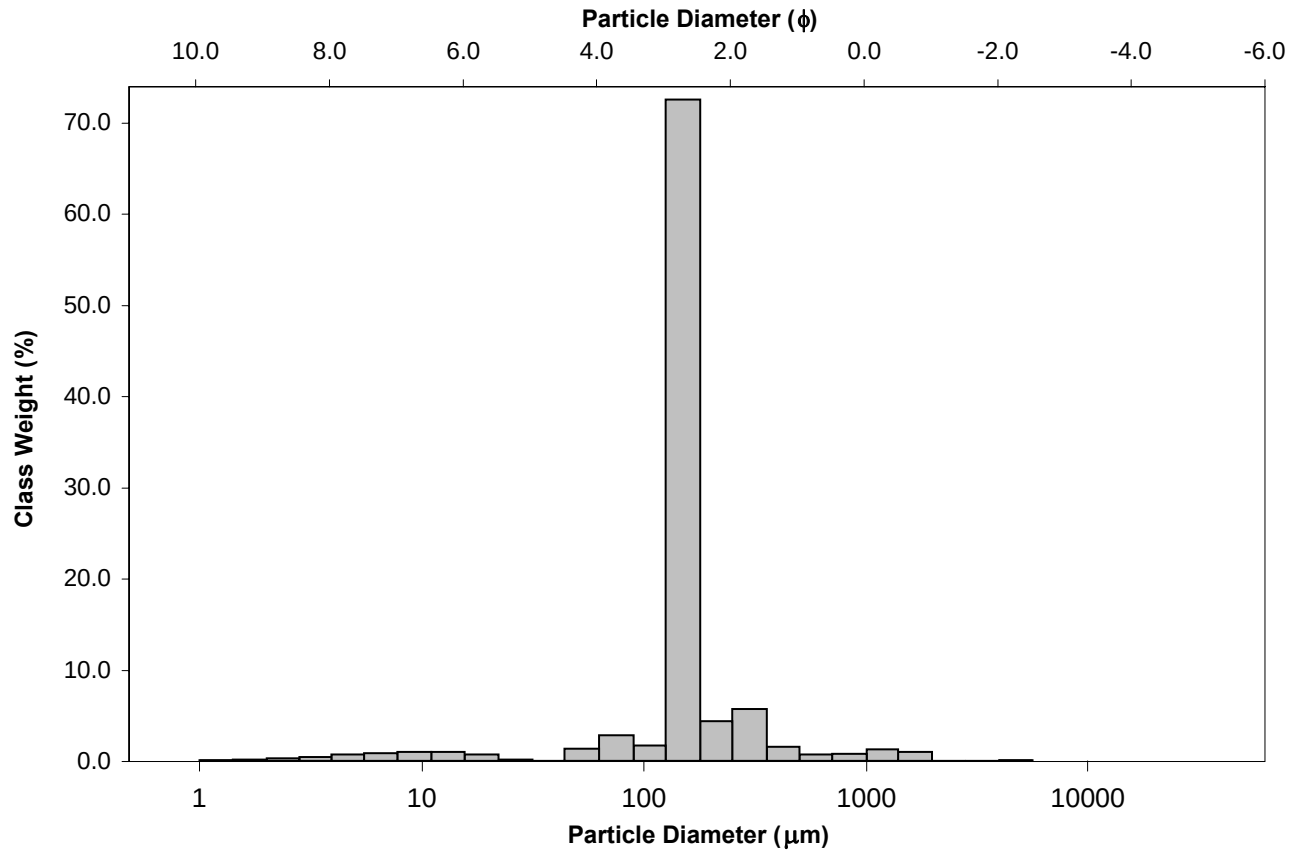
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	97.26	1.920
MEDIAN or D_{50}:	151.4	2.724
D_{90}:	264.3	3.362
(D_{90} / D_{10}):	2.718	1.751
(D_{90} - D_{10}):	167.1	1.442
(D_{75} / D_{25}):	1.280	1.140
(D_{75} - D_{25}):	37.47	0.356

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	1.4%
SAND:	93.1%	MEDIUM SAND:	7.2%
MUD:	6.8%	FINE SAND:	77.9%
		V FINE SAND:	4.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	1.4%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	1.9%
FINE GRAVEL:	0.1%	FINE SILT:	1.5%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.8%
V COARSE SAND:	2.2%	CLAY:	0.5%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	197.4	141.0	2.827	151.4	2.724	Fine Sand
SORTING (σ):	257.9	2.417	1.273	1.703	0.768	Moderately Sorted
SKEWNESS (Sk):	8.152	-2.040	2.040	-0.192	0.192	Fine Skewed
KURTOSIS (K):	103.4	12.48	12.48	4.915	4.915	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_45**

ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Bimodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Coarse Gravelly Fine Sand

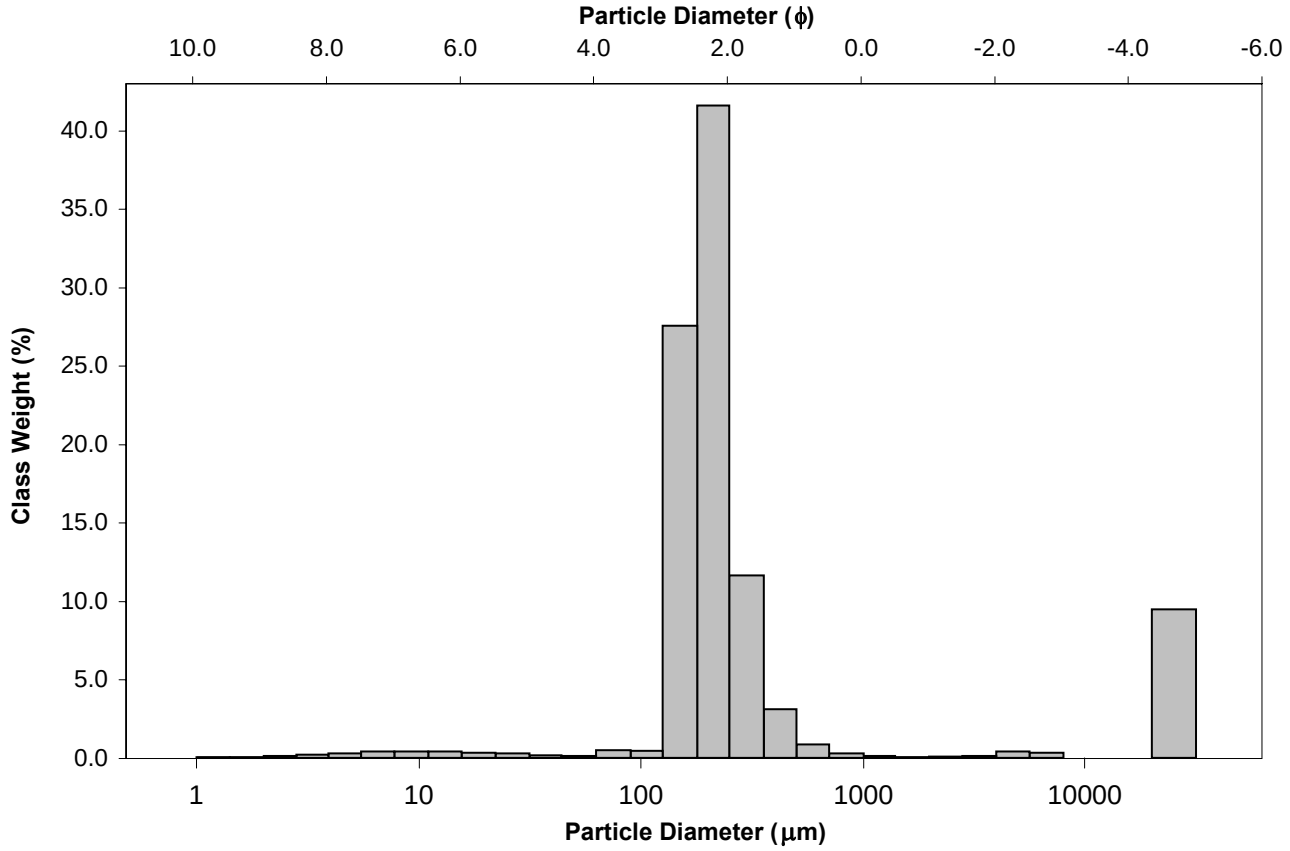
	μm	ϕ
MODE 1:	215.0	2.237
MODE 2:	25750.0	-4.650
MODE 3:		
D_{10}:	135.3	-4.439
MEDIAN or D_{50}:	209.3	2.256
D_{90}:	21686.5	2.886
(D_{90} / D_{10}):	160.3	-0.650
(D_{90} - D_{10}):	21551.2	7.324
(D_{75} / D_{25}):	1.725	1.432
(D_{75} - D_{25}):	119.0	0.787

GRAIN SIZE DISTRIBUTION

GRAVEL:	13.2%	COARSE SAND:	1.2%
SAND:	83.9%	MEDIUM SAND:	14.5%
MUD:	2.9%	FINE SAND:	67.1%
		V FINE SAND:	0.9%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	12.2%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.8%
FINE GRAVEL:	0.8%	FINE SILT:	0.7%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.3%
V COARSE SAND:	0.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	3370.4	346.9	1.527	234.8	2.090	Fine Sand
SORTING (σ):	8346.2	5.690	2.508	2.925	1.548	Poorly Sorted
SKEWNESS (Sk):	2.299	1.502	-1.502	0.568	-0.568	Very Coarse Skewed
KURTOSIS (K):	6.309	5.307	5.307	4.003	4.003	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_46** ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Poorly Sorted TEXTURAL GROUP: Slightly Gravelly Muddy Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Medium Silty Fine Sand

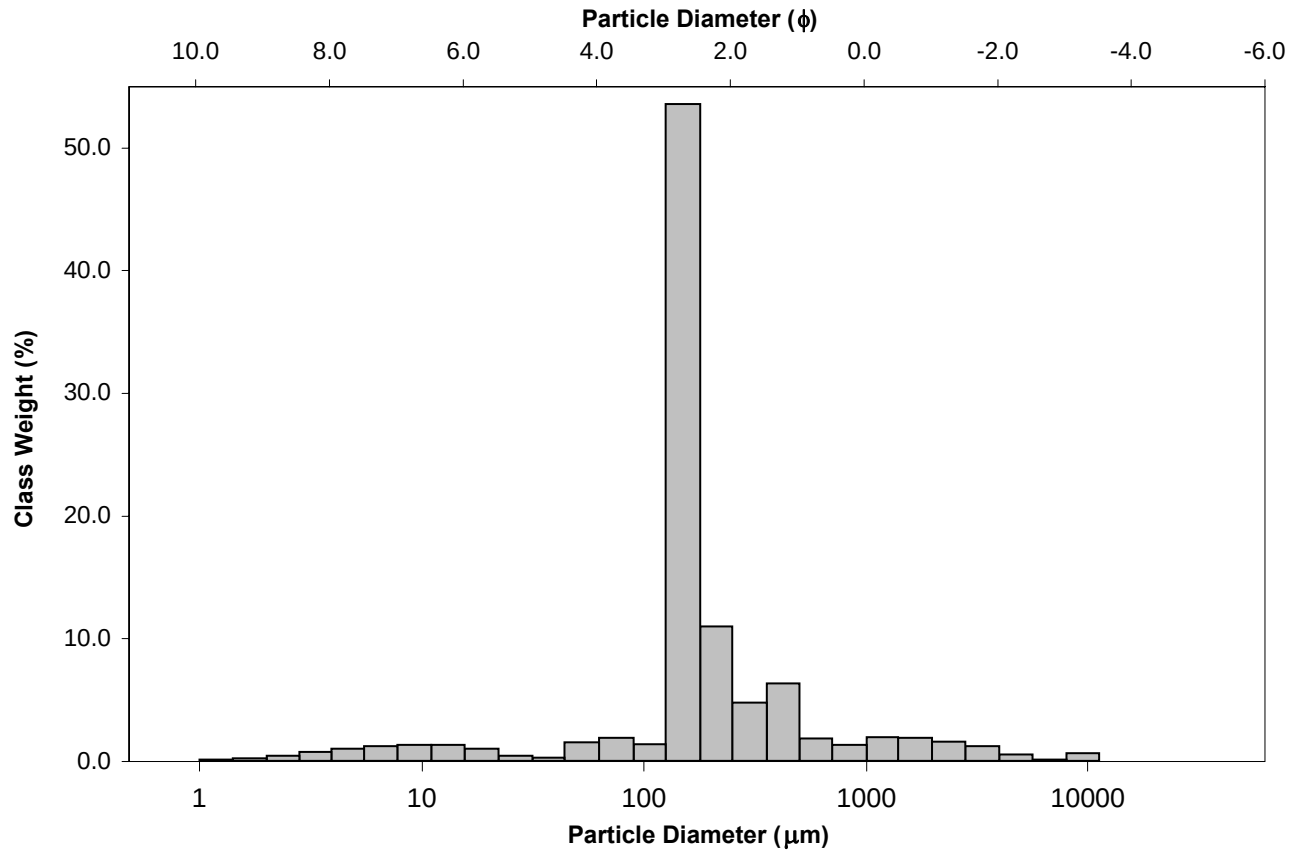
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	65.85	0.790
MEDIAN or D_{50}:	159.6	2.647
D_{90}:	578.5	3.925
(D_{90} / D_{10}):	8.786	4.971
(D_{90} - D_{10}):	512.7	3.135
(D_{75} / D_{25}):	1.657	1.338
(D_{75} - D_{25}):	88.89	0.728

GRAIN SIZE DISTRIBUTION

GRAVEL:	4.0%	COARSE SAND:	3.1%
SAND:	86.3%	MEDIUM SAND:	10.9%
MUD:	9.7%	FINE SAND:	65.4%
		V FINE SAND:	3.2%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	1.8%
COARSE GRAVEL:	0.0%	COARSE SILT:	1.4%
MEDIUM GRAVEL:	0.6%	MEDIUM SILT:	2.6%
FINE GRAVEL:	0.6%	FINE SILT:	2.2%
V FINE GRAVEL:	2.8%	V FINE SILT:	1.1%
V COARSE SAND:	3.7%	CLAY:	0.6%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	392.7	167.1	2.581	196.5	2.347	Fine Sand
SORTING (σ):	950.8	3.516	1.814	2.819	1.495	Poorly Sorted
SKEWNESS (Sk):	6.639	-0.650	0.650	0.251	-0.251	Coarse Skewed
KURTOSIS (K):	56.73	6.600	6.600	4.115	4.115	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_47** ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Moderately Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

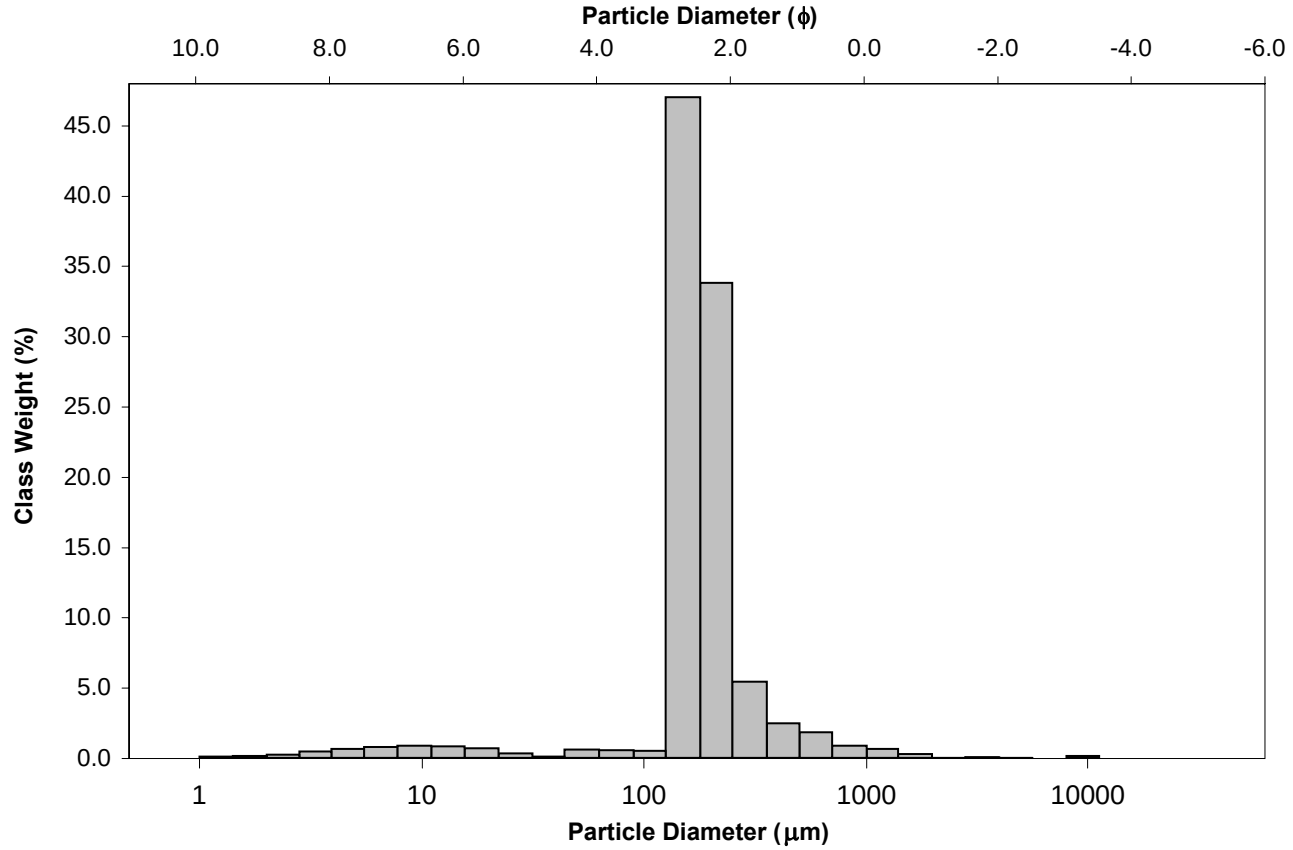
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	127.8	1.833
MEDIAN or D_{50}:	171.8	2.541
D_{90}:	280.6	2.968
(D_{90} / D_{10}):	2.196	1.619
(D_{90} - D_{10}):	152.8	1.135
(D_{75} / D_{25}):	1.528	1.279
(D_{75} - D_{25}):	75.46	0.612

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	2.7%
SAND:	93.8%	MEDIUM SAND:	7.9%
MUD:	6.0%	FINE SAND:	81.2%
		V FINE SAND:	1.0%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.7%
COARSE GRAVEL:	0.0%	COARSE SILT:	1.1%
MEDIUM GRAVEL:	0.2%	MEDIUM SILT:	1.7%
FINE GRAVEL:	0.0%	FINE SILT:	1.4%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.7%
V COARSE SAND:	0.9%	CLAY:	0.4%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	221.5	161.3	2.632	176.5	2.502	Fine Sand
SORTING (σ):	411.9	2.362	1.240	1.777	0.830	Moderately Sorted
SKEWNESS (Sk):	18.84	-2.379	2.379	-0.110	0.110	Fine Skewed
KURTOSIS (K):	416.5	13.96	13.96	2.737	2.737	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_48**

ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Moderately Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

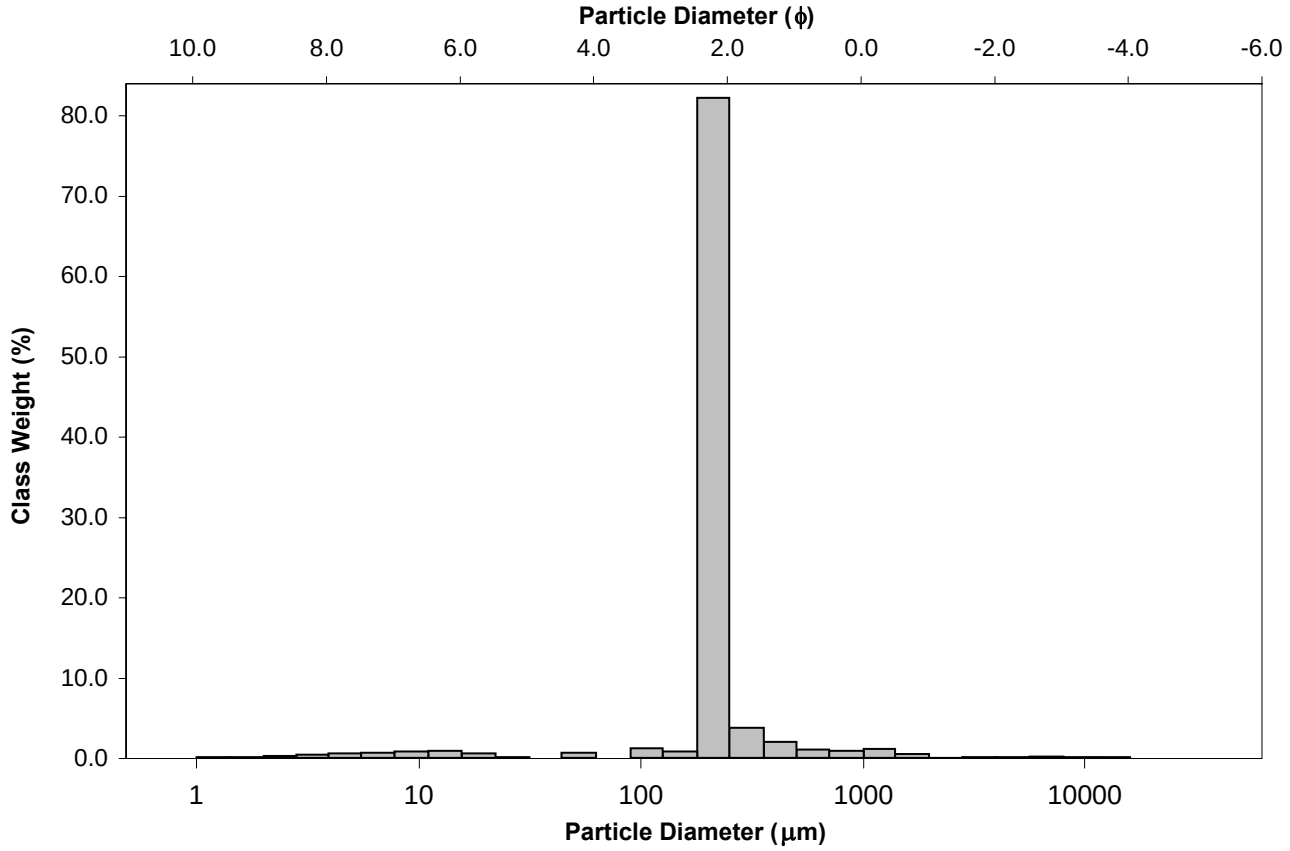
	μm	ϕ
MODE 1:	215.0	2.237
MODE 2:		
MODE 3:		
D_{10}:	181.5	1.941
MEDIAN or D_{50}:	213.2	2.230
D_{90}:	260.5	2.462
(D_{90} / D_{10}):	1.435	1.269
(D_{90} - D_{10}):	78.97	0.521
(D_{75} / D_{25}):	1.223	1.139
(D_{75} - D_{25}):	42.98	0.290

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.7%	COARSE SAND:	2.0%
SAND:	93.5%	MEDIUM SAND:	6.1%
MUD:	5.9%	FINE SAND:	82.5%
		V FINE SAND:	1.2%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.8%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.2%	MEDIUM SILT:	1.7%
FINE GRAVEL:	0.3%	FINE SILT:	1.4%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.7%
V COARSE SAND:	1.6%	CLAY:	0.4%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	283.8	193.6	2.369	213.2	2.230	Fine Sand
SORTING (σ):	650.2	2.467	1.302	1.647	0.720	Moderately Sorted
SKEWNESS (Sk):	14.52	-2.399	2.399	-0.238	0.238	Fine Skewed
KURTOSIS (K):	250.1	15.16	15.16	5.785	5.785	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_49**

ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

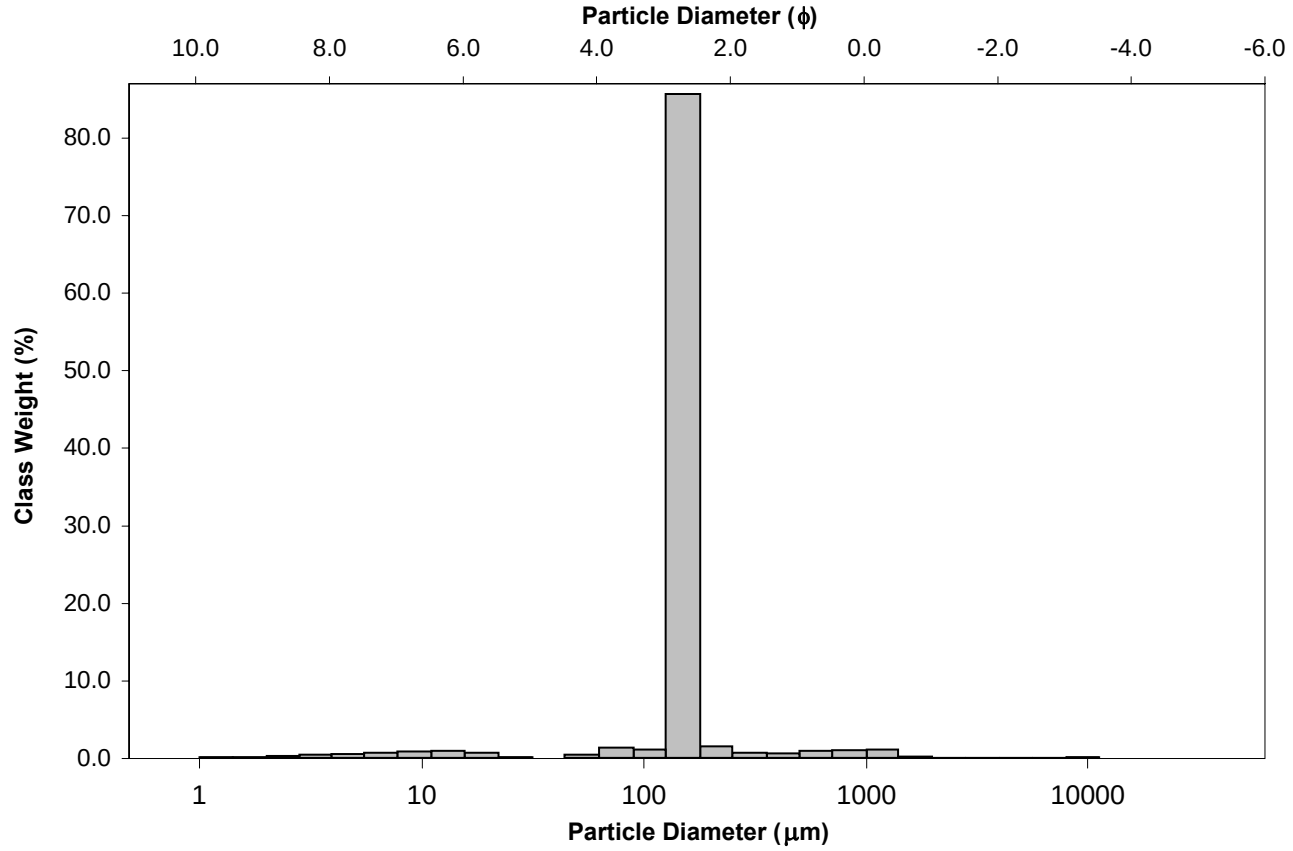
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	126.3	2.499
MEDIAN or D_{50}:	149.5	2.742
D_{90}:	176.9	2.985
(D_{90} / D_{10}):	1.401	1.194
(D_{90} - D_{10}):	50.60	0.486
(D_{75} / D_{25}):	1.234	1.117
(D_{75} - D_{25}):	31.53	0.304

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	1.7%
SAND:	94.6%	MEDIUM SAND:	1.3%
MUD:	5.2%	FINE SAND:	88.0%
		V FINE SAND:	2.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.5%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.1%	MEDIUM SILT:	1.6%
FINE GRAVEL:	0.0%	FINE SILT:	1.2%
V FINE GRAVEL:	0.0%	V FINE SILT:	0.7%
V COARSE SAND:	1.2%	CLAY:	0.4%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	185.7	137.5	2.862	149.5	2.742	Fine Sand
SORTING (σ):	377.9	2.203	1.140	1.331	0.413	Well Sorted
SKEWNESS (Sk):	19.97	-2.499	2.499	-0.222	0.222	Fine Skewed
KURTOSIS (K):	474.1	17.18	17.18	2.758	2.758	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_52** ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

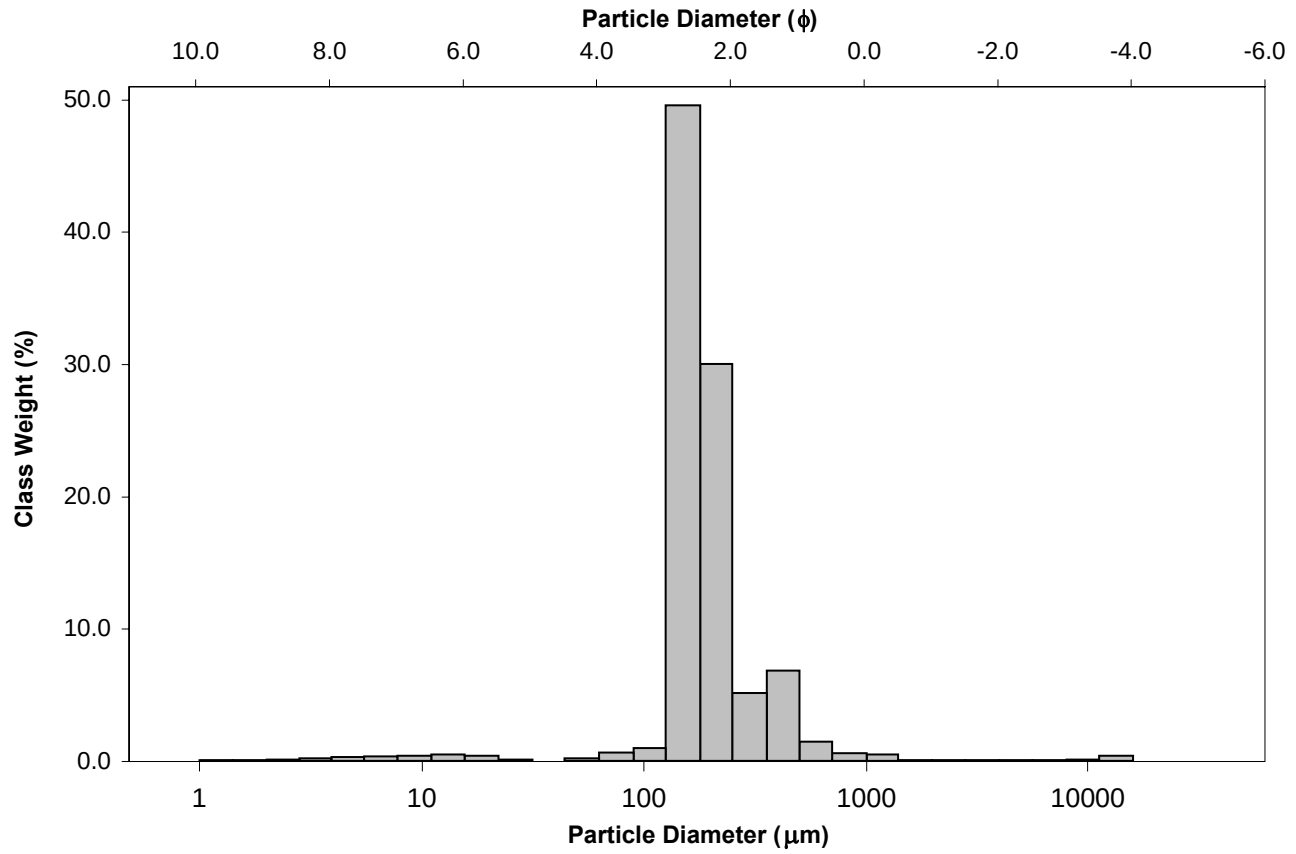
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.0	1.475
MEDIAN or D_{50}:	172.2	2.538
D_{90}:	359.6	2.944
(D_{90} / D_{10}):	2.767	1.995
(D_{90} - D_{10}):	229.6	1.468
(D_{75} / D_{25}):	1.548	1.292
(D_{75} - D_{25}):	79.22	0.631

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.9%	COARSE SAND:	2.1%
SAND:	96.2%	MEDIUM SAND:	11.9%
MUD:	2.9%	FINE SAND:	80.1%
		V FINE SAND:	1.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.5%
MEDIUM GRAVEL:	0.6%	MEDIUM SILT:	0.9%
FINE GRAVEL:	0.2%	FINE SILT:	0.7%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.4%
V COARSE SAND:	0.5%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	292.0	181.5	2.462	179.6	2.477	Fine Sand
SORTING (σ):	975.1	2.132	1.092	1.418	0.504	Moderately Well Sorted
SKEWNESS (Sk):	12.20	-0.930	0.930	0.363	-0.363	Very Coarse Skewed
KURTOSIS (K):	158.5	19.11	19.11	1.225	1.225	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_53**

ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Trimodal, Very Poorly Sorted

TEXTURAL GROUP: Sandy Gravel

SEDIMENT NAME: Sandy Coarse Gravel

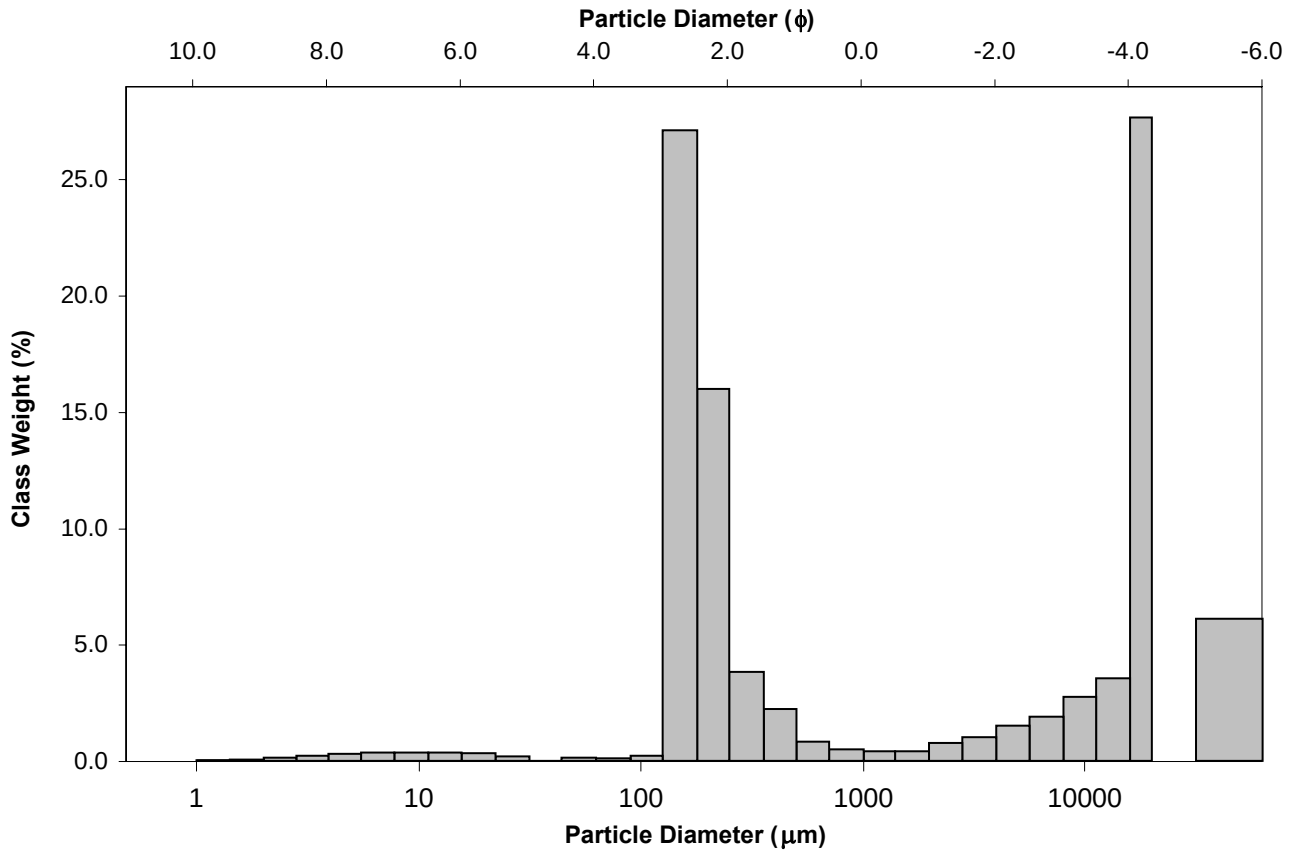
	μm	ϕ
MODE 1:	18000.0	-4.161
MODE 2:	152.5	2.737
MODE 3:	47250.0	-5.477
D_{10}:	136.1	-5.188
MEDIAN or D_{50}:	289.1	1.790
D_{90}:	36455.0	2.877
(D_{90} / D_{10}):	267.9	-0.555
(D_{90} - D_{10}):	36318.9	8.065
(D_{75} / D_{25}):	105.2	-0.636
(D_{75} - D_{25}):	17064.0	6.717

GRAIN SIZE DISTRIBUTION

GRAVEL:	43.1%	COARSE SAND:	1.4%
SAND:	54.2%	MEDIUM SAND:	6.3%
MUD:	2.7%	FINE SAND:	45.2%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	12.4%	V COARSE SILT:	0.2%
COARSE GRAVEL:	18.7%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	6.6%	MEDIUM SILT:	0.7%
FINE GRAVEL:	3.5%	FINE SILT:	0.7%
V FINE GRAVEL:	1.8%	V FINE SILT:	0.4%
V COARSE SAND:	0.9%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	10479.9	1272.4	-0.348	933.7	0.099	Coarse Sand
SORTING (σ):	15617.0	11.65	3.542	8.305	3.054	Very Poorly Sorted
SKEWNESS (Sk):	1.510	0.139	-0.139	0.723	-0.723	Very Coarse Skewed
KURTOSIS (K):	4.012	1.675	1.675	0.522	0.522	Very Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_54** ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

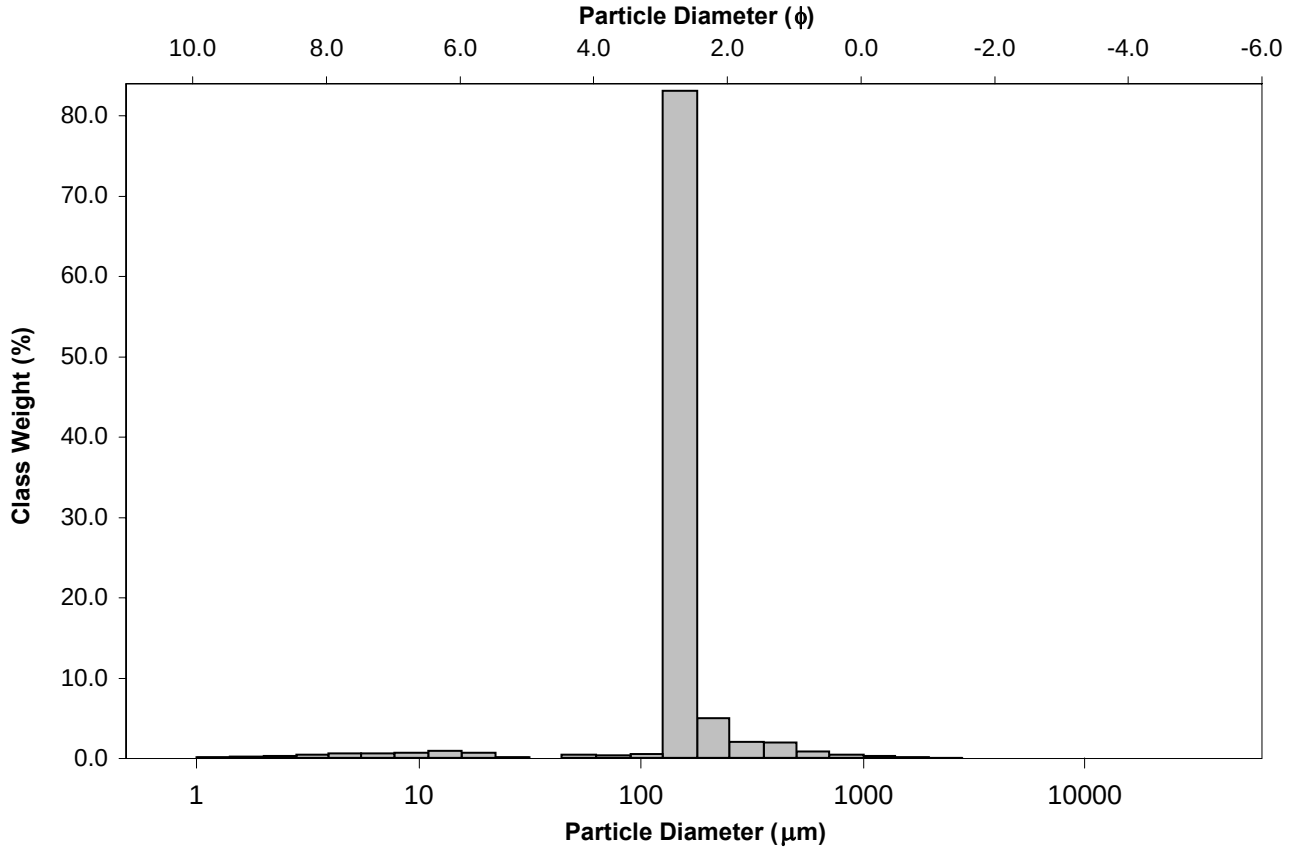
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	127.2	2.475
MEDIAN or D_{50}:	151.3	2.725
D_{90}:	179.9	2.975
(D_{90} / D_{10}):	1.414	1.202
(D_{90} - D_{10}):	52.67	0.500
(D_{75} / D_{25}):	1.242	1.122
(D_{75} - D_{25}):	32.82	0.312

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.0%	COARSE SAND:	1.2%
SAND:	94.9%	MEDIUM SAND:	3.8%
MUD:	5.1%	FINE SAND:	88.7%
		V FINE SAND:	0.8%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.5%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	1.5%
FINE GRAVEL:	0.0%	FINE SILT:	1.2%
V FINE GRAVEL:	0.0%	V FINE SILT:	0.7%
V COARSE SAND:	0.4%	CLAY:	0.4%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	166.6	138.6	2.851	151.3	2.725	Fine Sand
SORTING (σ):	111.7	2.109	1.076	1.357	0.440	Well Sorted
SKEWNESS (Sk):	7.537	-3.507	3.507	-0.132	0.132	Fine Skewed
KURTOSIS (K):	90.45	19.62	19.62	2.891	2.891	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_55**

ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Very Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

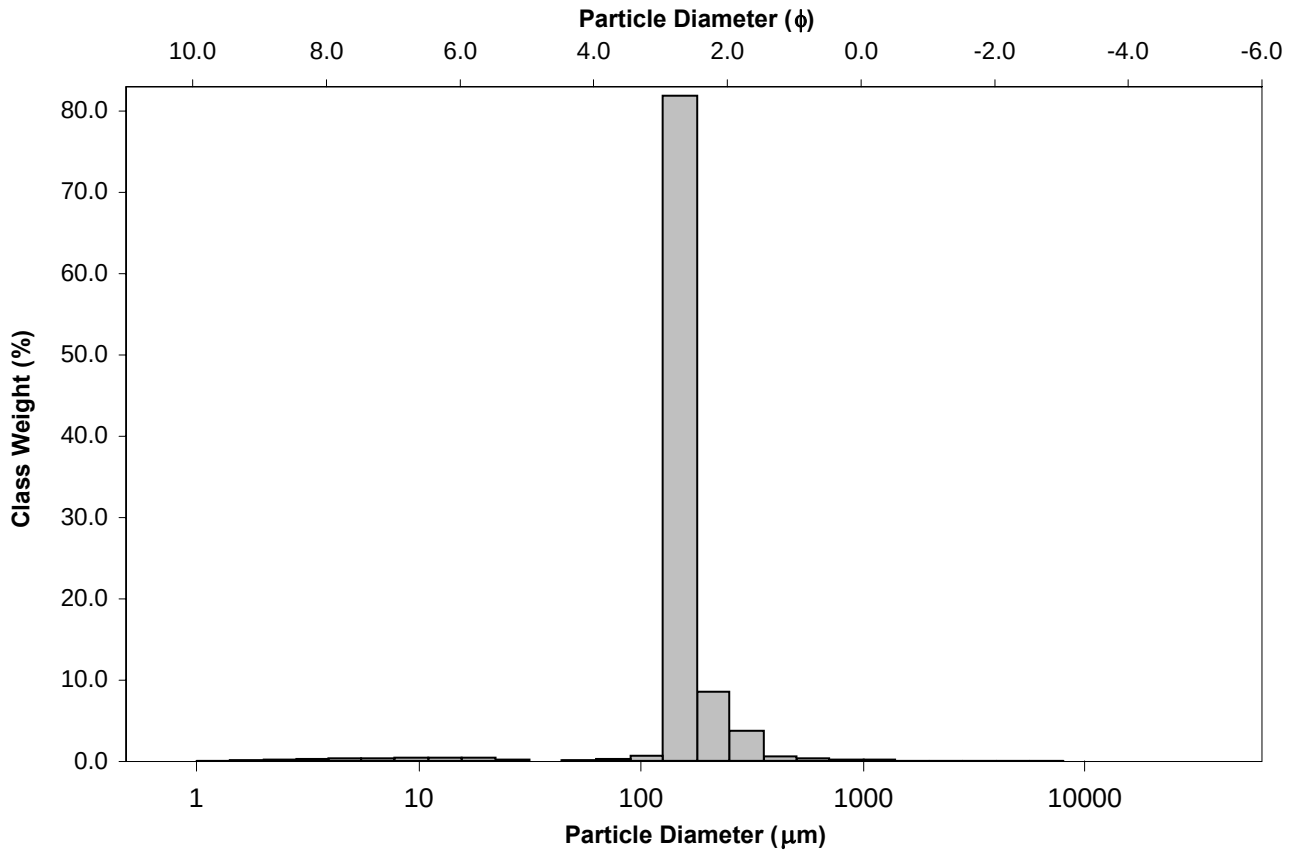
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	128.4	2.295
MEDIAN or D_{50}:	153.0	2.708
D_{90}:	203.7	2.961
(D_{90} / D_{10}):	1.586	1.290
(D_{90} - D_{10}):	75.28	0.665
(D_{75} / D_{25}):	1.245	1.124
(D_{75} - D_{25}):	33.58	0.316

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.6%
SAND:	97.0%	MEDIUM SAND:	4.2%
MUD:	2.9%	FINE SAND:	91.1%
		V FINE SAND:	0.9%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.1%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.8%
FINE GRAVEL:	0.1%	FINE SILT:	0.7%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.4%
V COARSE SAND:	0.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	171.7	148.0	2.756	153.0	2.708	Fine Sand
SORTING (σ):	195.5	1.807	0.854	1.197	0.260	Very Well Sorted
SKEWNESS (Sk):	24.49	-4.058	4.058	0.218	-0.218	Coarse Skewed
KURTOSIS (K):	744.7	31.50	31.50	1.306	1.306	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_56**

ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Fine Gravelly Fine Sand

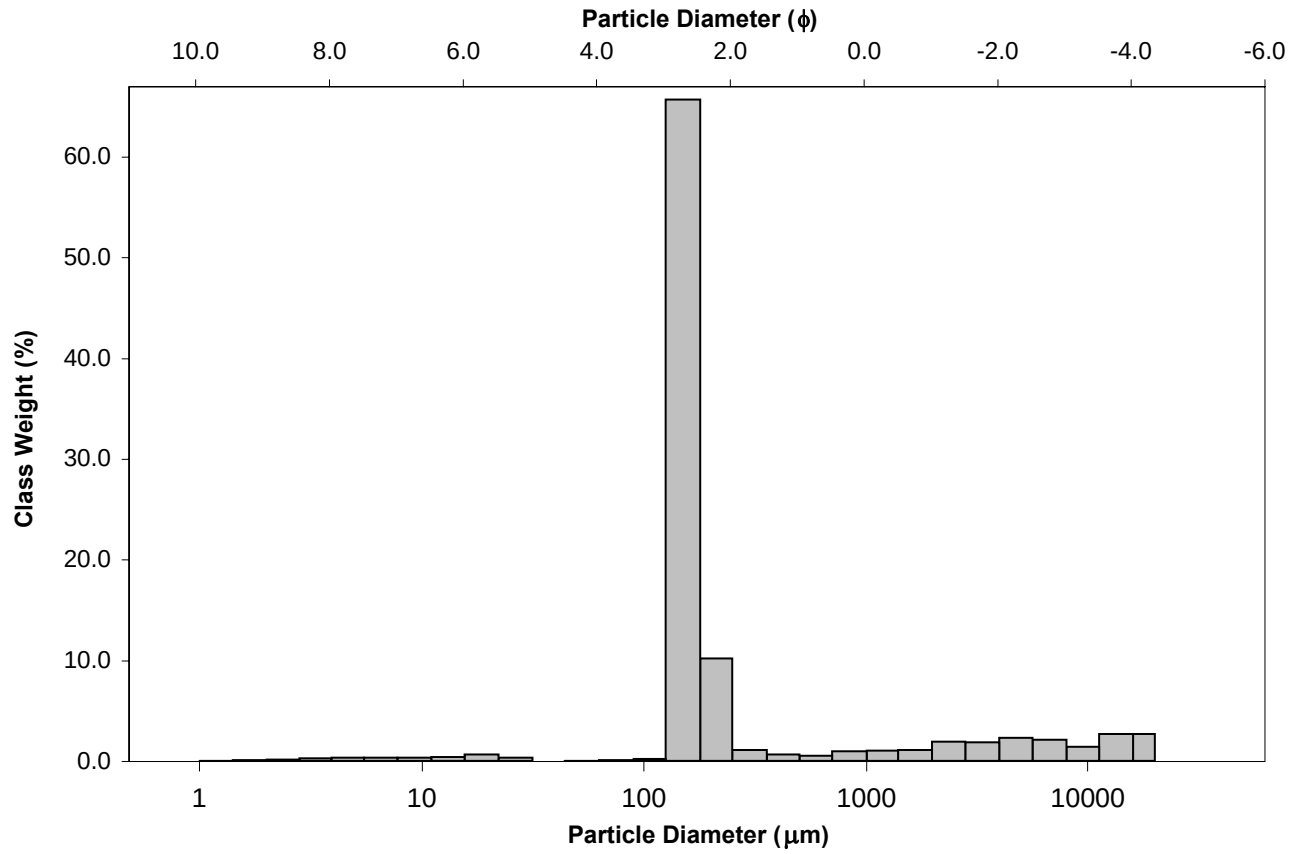
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	129.6	-2.049
MEDIAN or D_{50}:	160.6	2.639
D_{90}:	4138.6	2.948
(D_{90} / D_{10}):	31.94	-1.439
(D_{90} - D_{10}):	4009.0	4.997
(D_{75} / D_{25}):	1.456	1.237
(D_{75} - D_{25}):	64.03	0.542

GRAIN SIZE DISTRIBUTION

GRAVEL:	14.0%	COARSE SAND:	1.4%
SAND:	83.1%	MEDIUM SAND:	1.7%
MUD:	3.0%	FINE SAND:	77.5%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	1.7%	COARSE SILT:	1.0%
MEDIUM GRAVEL:	4.1%	MEDIUM SILT:	0.8%
FINE GRAVEL:	4.4%	FINE SILT:	0.7%
V FINE GRAVEL:	3.7%	V FINE SILT:	0.4%
V COARSE SAND:	2.1%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	1351.1	263.4	1.925	279.5	1.839	Medium Sand
SORTING (σ):	3470.4	4.387	2.133	3.213	1.684	Poorly Sorted
SKEWNESS (Sk):	3.381	1.246	-1.246	0.855	-0.855	Very Coarse Skewed
KURTOSIS (K):	14.04	5.211	5.211	4.755	4.755	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_57** ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Unimodal, Very Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

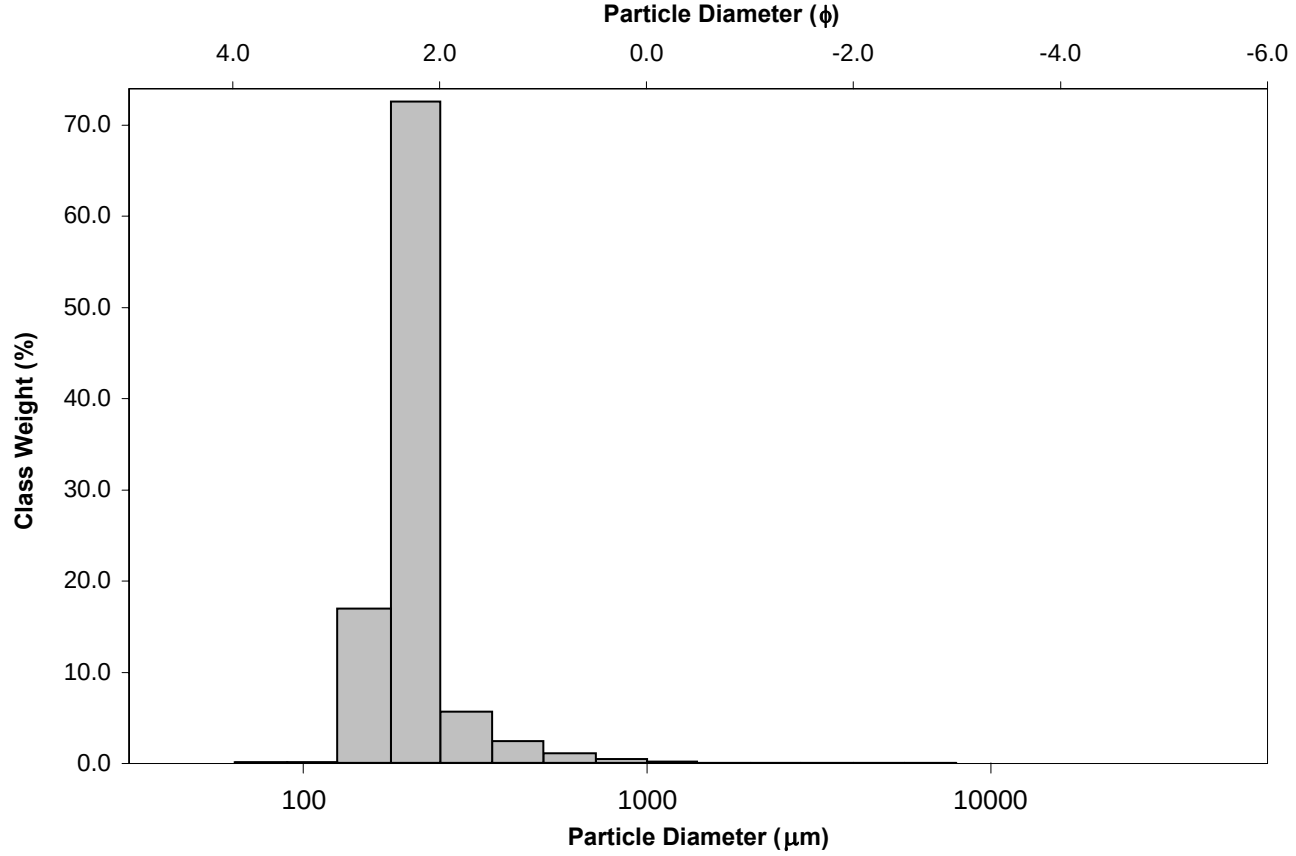
	μm	ϕ
MODE 1:	215.0	2.237
MODE 2:		
MODE 3:		
D_{10}:	148.4	1.987
MEDIAN or D_{50}:	207.5	2.269
D_{90}:	252.2	2.753
(D_{90} / D_{10}):	1.700	1.385
(D_{90} - D_{10}):	103.8	0.765
(D_{75} / D_{25}):	1.264	1.161
(D_{75} - D_{25}):	48.66	0.338

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	1.5%
SAND:	98.6%	MEDIUM SAND:	8.3%
MUD:	1.3%	FINE SAND:	88.4%
		V FINE SAND:	0.2%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.0%	FINE SILT:	0.2%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.2%
V COARSE SAND:	0.2%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	226.0	202.9	2.301	203.6	2.296	Fine Sand
SORTING (σ):	176.1	1.588	0.668	1.265	0.339	Very Well Sorted
SKEWNESS (Sk):	20.99	-3.529	3.529	-0.042	0.042	Symmetrical
KURTOSIS (K):	632.9	34.41	34.41	1.632	1.632	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_61** ANALYST & DATE: Mj.Grey, 11/23/2012

SAMPLE TYPE: Unimodal, Very Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

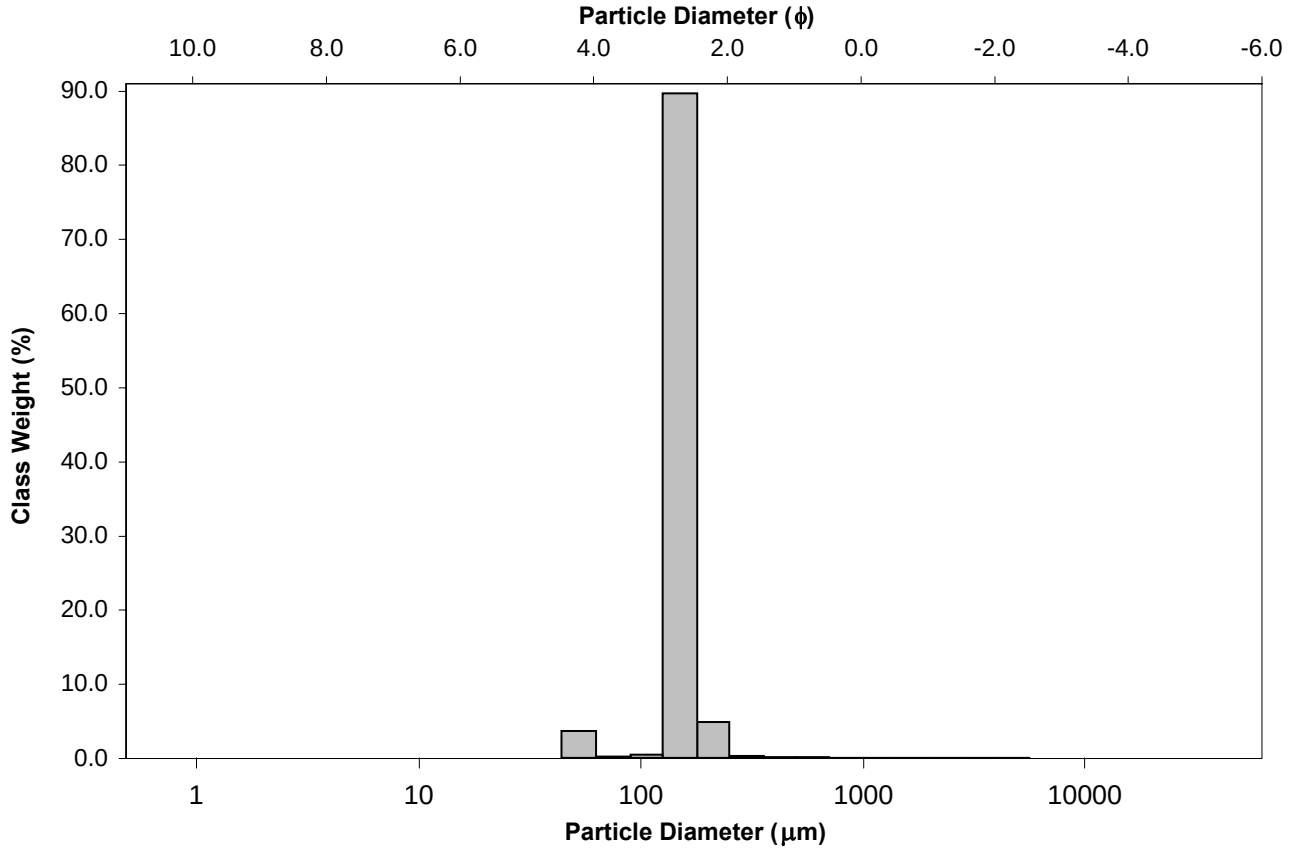
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	127.9	2.502
MEDIAN or D_{50}:	150.3	2.735
D_{90}:	176.5	2.967
(D_{90} / D_{10}):	1.380	1.186
(D_{90} - D_{10}):	48.58	0.464
(D_{75} / D_{25}):	1.223	1.112
(D_{75} - D_{25}):	30.28	0.290

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.2%
SAND:	96.4%	MEDIUM SAND:	0.4%
MUD:	3.6%	FINE SAND:	95.1%
		V FINE SAND:	0.7%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	3.6%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.0%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.0%
FINE GRAVEL:	0.0%	FINE SILT:	0.0%
V FINE GRAVEL:	0.0%	V FINE SILT:	0.0%
V COARSE SAND:	0.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	155.9	147.5	2.761	150.3	2.735	Fine Sand
SORTING (σ):	101.3	1.283	0.359	1.133	0.180	Very Well Sorted
SKEWNESS (Sk):	31.94	-0.188	0.188	0.011	-0.011	Symmetrical
KURTOSIS (K):	1258.2	34.92	34.92	0.755	0.755	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_62** ANALYST & DATE: Mj.Grey, 11/26/2012

SAMPLE TYPE: Unimodal, Very Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

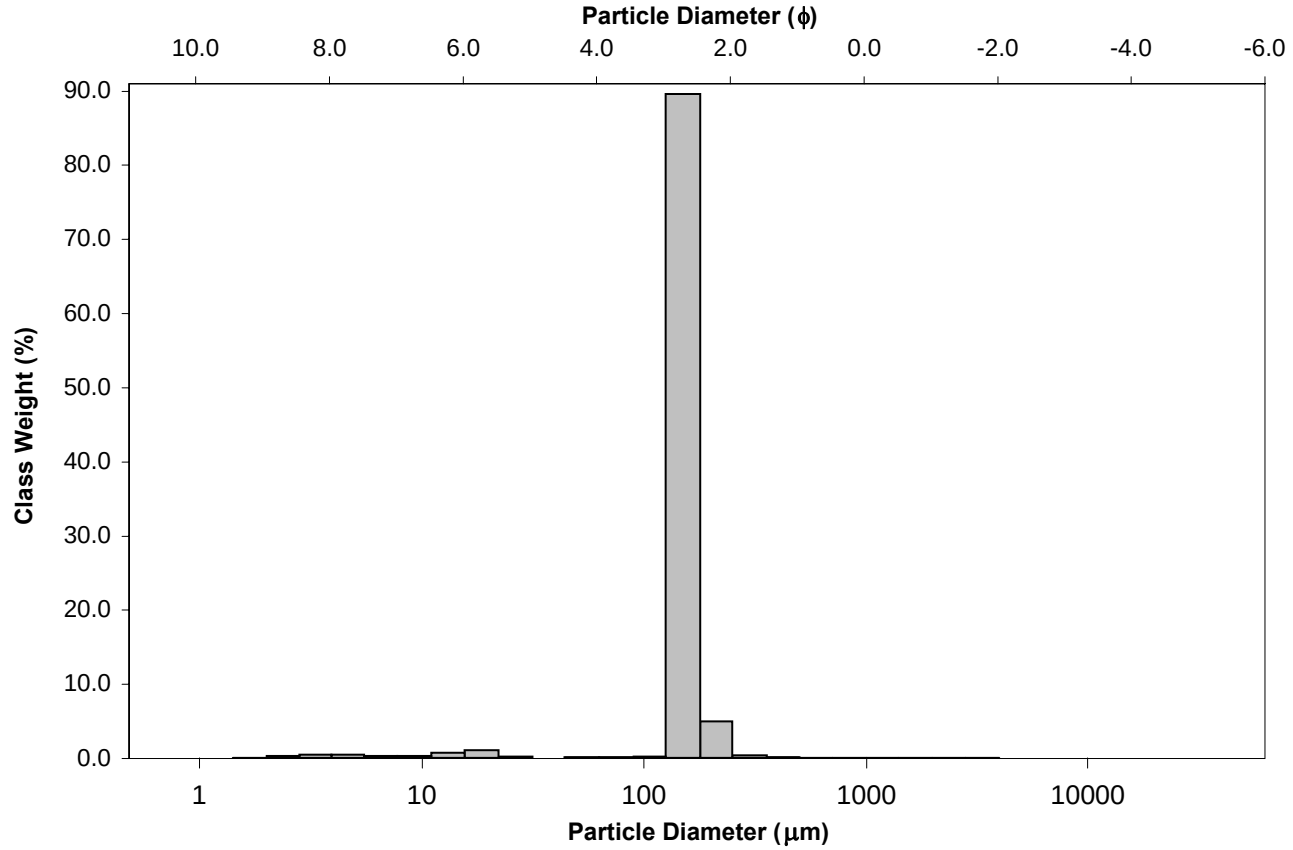
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	128.0	2.501
MEDIAN or D_{50}:	150.3	2.734
D_{90}:	176.6	2.966
(D_{90} / D_{10}):	1.380	1.186
(D_{90} - D_{10}):	48.59	0.464
(D_{75} / D_{25}):	1.223	1.112
(D_{75} - D_{25}):	30.29	0.290

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.1%
SAND:	96.2%	MEDIUM SAND:	0.5%
MUD:	3.7%	FINE SAND:	95.2%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.1%
COARSE GRAVEL:	0.0%	COARSE SILT:	1.1%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	1.0%
FINE GRAVEL:	0.0%	FINE SILT:	0.7%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.7%
V COARSE SAND:	0.0%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	154.2	138.4	2.853	150.3	2.734	Fine Sand
SORTING (σ):	93.40	1.769	0.823	1.134	0.182	Very Well Sorted
SKEWNESS (Sk):	25.56	-4.757	4.757	0.023	-0.023	Symmetrical
KURTOSIS (K):	818.4	29.80	29.80	0.773	0.773	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_64** ANALYST & DATE: Mj.Grey, 11/26/2012

SAMPLE TYPE: Unimodal, Very Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

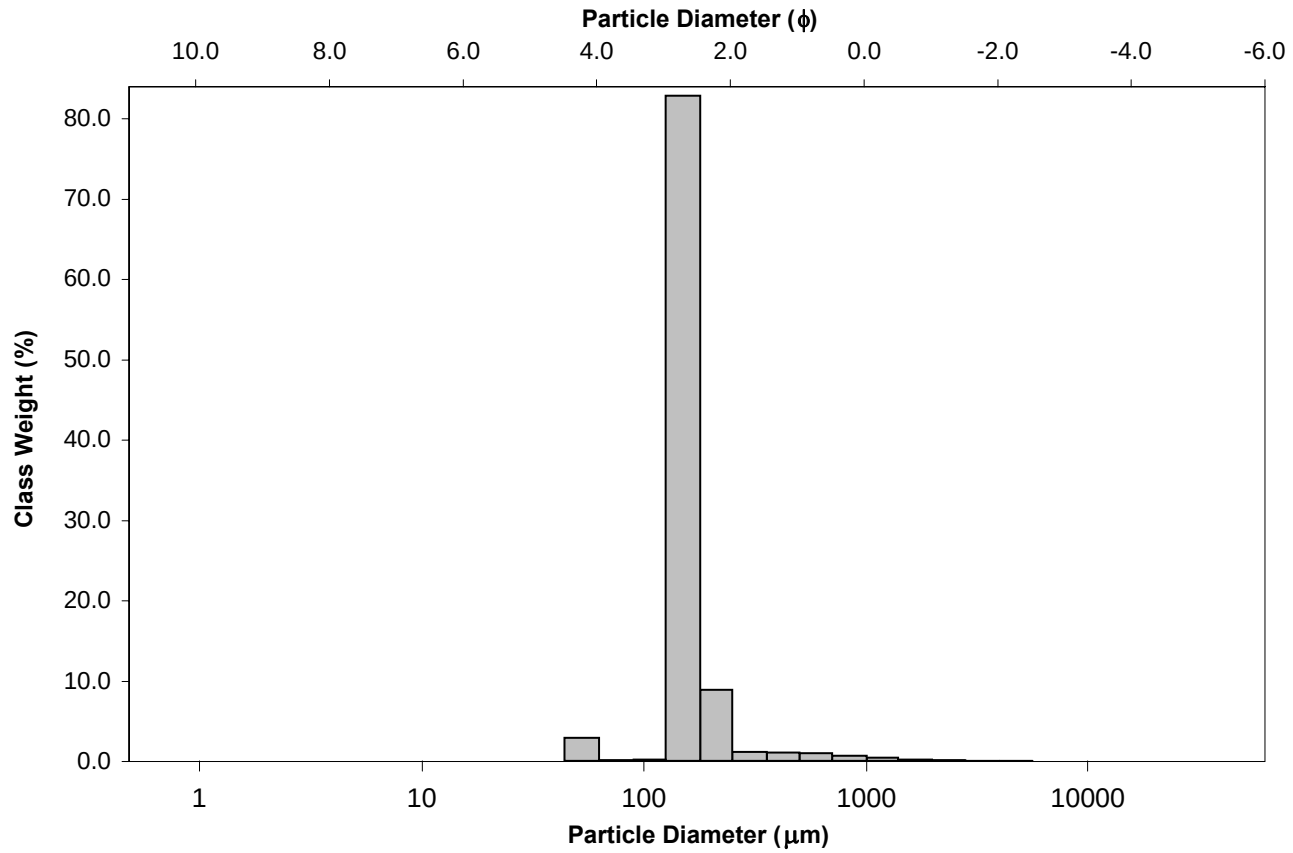
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	128.8	2.320
MEDIAN or D_{50}:	153.1	2.707
D_{90}:	200.3	2.957
(D_{90} / D_{10}):	1.555	1.275
(D_{90} - D_{10}):	71.49	0.637
(D_{75} / D_{25}):	1.242	1.122
(D_{75} - D_{25}):	33.21	0.312

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.3%	COARSE SAND:	1.6%
SAND:	96.9%	MEDIUM SAND:	2.1%
MUD:	2.8%	FINE SAND:	92.3%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	2.8%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.0%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.0%
FINE GRAVEL:	0.0%	FINE SILT:	0.0%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.0%
V COARSE SAND:	0.6%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	182.5	159.2	2.651	153.1	2.707	Fine Sand
SORTING (σ):	196.8	1.459	0.545	1.191	0.252	Very Well Sorted
SKEWNESS (Sk):	12.28	2.765	-2.765	0.207	-0.207	Coarse Skewed
KURTOSIS (K):	209.1	22.20	22.20	1.260	1.260	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_71** ANALYST & DATE: Mj.Grey, 11/26/2012

SAMPLE TYPE: Trimodal, Very Poorly Sorted TEXTURAL GROUP: Gravelly Muddy Sand

SEDIMENT NAME: Coarse Gravelly Medium Silty Fine Sand

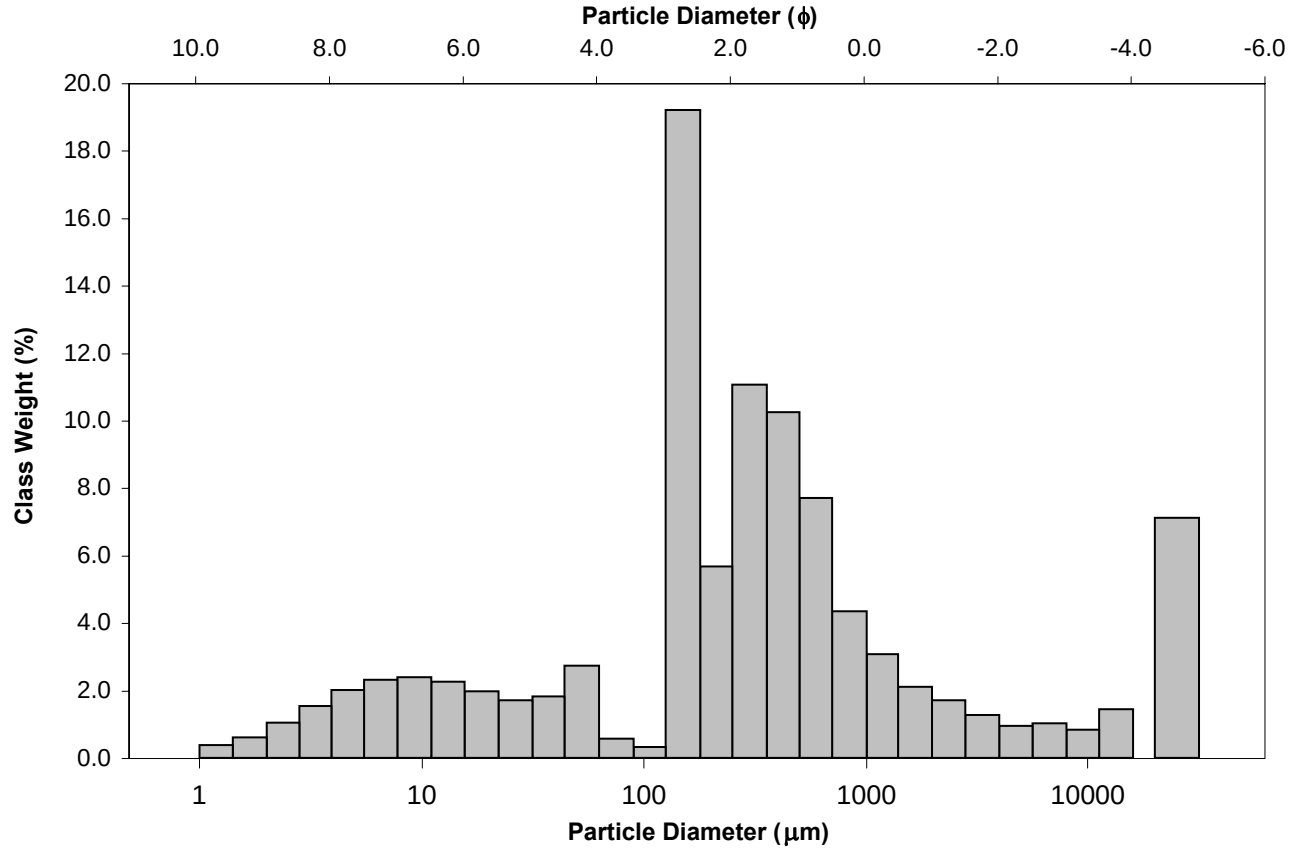
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:	302.5	1.747
MODE 3:	25750.0	-4.650
D_{10}:	10.20	-3.666
MEDIAN or D_{50}:	279.8	1.838
D_{90}:	12689.2	6.615
(D_{90} / D_{10}):	1244.0	-1.805
(D_{90} - D_{10}):	12679.0	10.28
(D_{75} / D_{25}):	5.460	6.295
(D_{75} - D_{25}):	592.8	2.449

GRAIN SIZE DISTRIBUTION

GRAVEL:	16.1%	COARSE SAND:	11.7%
SAND:	63.2%	MEDIUM SAND:	20.7%
MUD:	20.7%	FINE SAND:	24.8%
		V FINE SAND:	1.0%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	4.4%
COARSE GRAVEL:	9.1%	COARSE SILT:	3.6%
MEDIUM GRAVEL:	2.2%	MEDIUM SILT:	4.5%
FINE GRAVEL:	1.9%	FINE SILT:	4.2%
V FINE GRAVEL:	2.9%	V FINE SILT:	2.5%
V COARSE SAND:	5.0%	CLAY:	1.5%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	3072.6	284.7	1.812	255.8	1.967	Medium Sand
SORTING (σ):	7427.9	9.940	3.313	10.58	3.403	Very Poorly Sorted
SKEWNESS (Sk):	2.583	0.040	-0.040	-0.009	0.009	Symmetrical
KURTOSIS (K):	7.957	3.079	3.079	2.068	2.068	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_75**

ANALYST & DATE: Mj.Grey, 11/26/2012

SAMPLE TYPE: Polymodal, Very Poorly Sorted

TEXTURAL GROUP: Muddy Sandy Gravel

SEDIMENT NAME: Medium Silty Sandy Fine Gravel

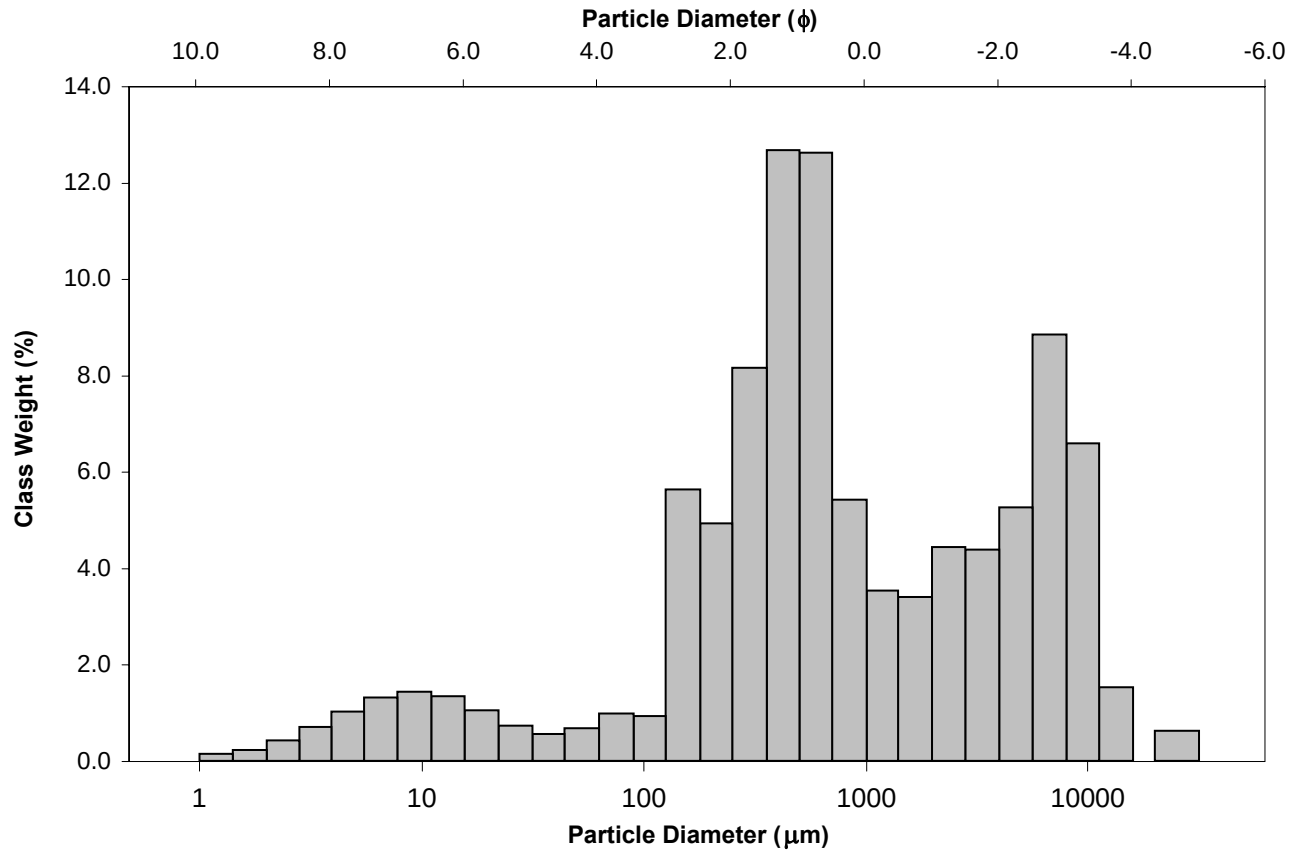
	μm	ϕ
MODE 1:	427.5	1.247
MODE 2:	6800.0	-2.743
MODE 3:	152.5	2.737
D_{10}:	66.89	-2.931
MEDIAN or D_{50}:	604.1	0.727
D_{90}:	7627.6	3.902
(D_{90} / D_{10}):	114.0	-1.331
(D_{90} - D_{10}):	7560.8	6.833
(D_{75} / D_{25}):	12.20	-1.036
(D_{75} - D_{25}):	3136.5	3.608

GRAIN SIZE DISTRIBUTION

GRAVEL:	31.8%	COARSE SAND:	18.1%
SAND:	58.4%	MEDIUM SAND:	20.8%
MUD:	9.8%	FINE SAND:	10.6%
		V FINE SAND:	1.9%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	1.2%
COARSE GRAVEL:	0.8%	COARSE SILT:	1.8%
MEDIUM GRAVEL:	8.0%	MEDIUM SILT:	2.8%
FINE GRAVEL:	14.2%	FINE SILT:	2.3%
V FINE GRAVEL:	8.8%	V FINE SILT:	1.1%
V COARSE SAND:	6.9%	CLAY:	0.6%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	2482.5	675.8	0.565	839.9	0.252	Coarse Sand
SORTING (σ):	3797.4	7.054	2.819	7.010	2.809	Very Poorly Sorted
SKEWNESS (Sk):	2.704	-0.731	0.731	0.041	-0.041	Symmetrical
KURTOSIS (K):	13.53	3.605	3.605	1.129	1.129	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_76** ANALYST & DATE: Mj.Grey, 11/26/2012

SAMPLE TYPE: Trimodal, Very Poorly Sorted TEXTURAL GROUP: Muddy Sandy Gravel

SEDIMENT NAME: Medium Silty Sandy Very Coarse Gravel

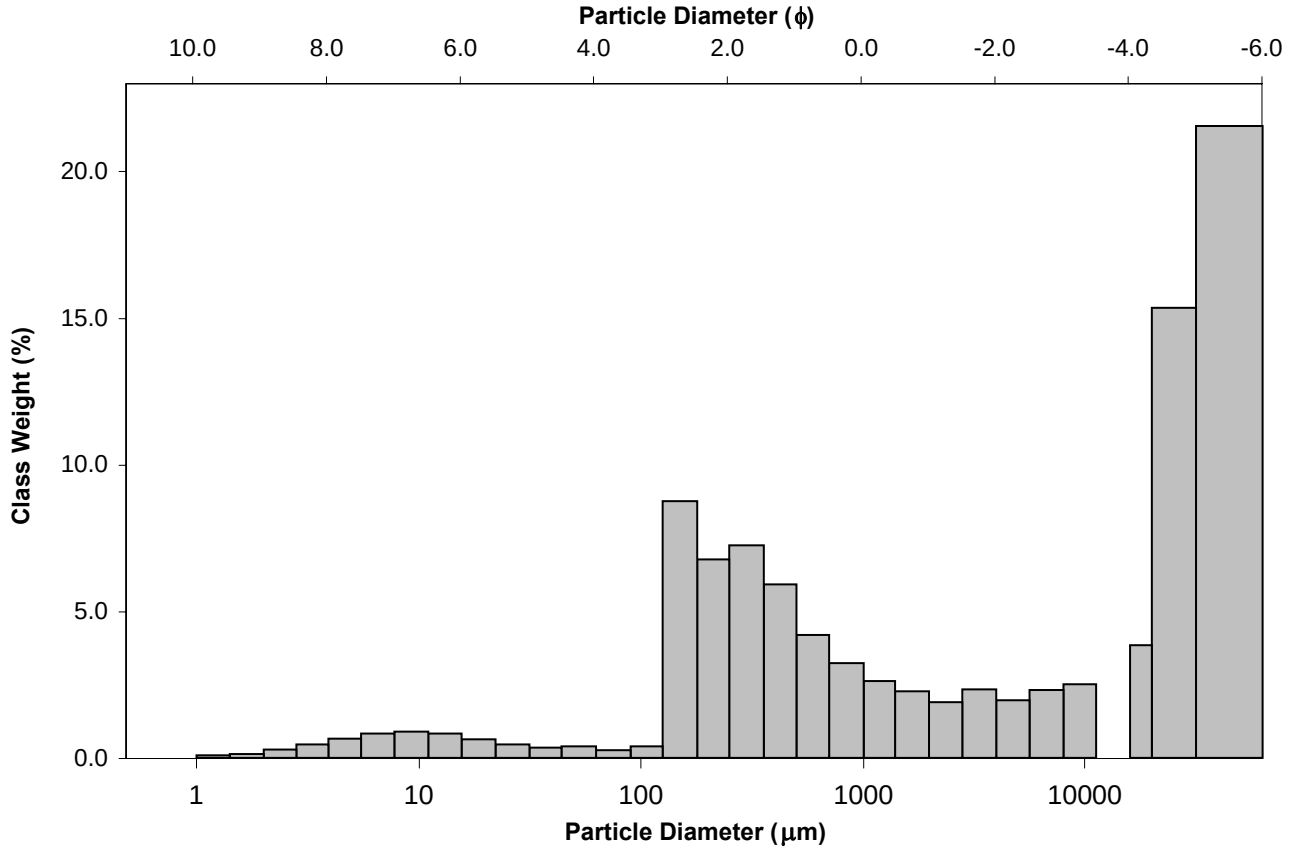
	μm	ϕ
MODE 1:	47250.0	-5.477
MODE 2:	152.5	2.737
MODE 3:	302.5	1.747
D_{10}:	155.9	-5.688
MEDIAN or D_{50}:	20385.9	-4.350
D_{90}:	51545.1	2.681
(D_{90} / D_{10}):	330.5	-0.471
(D_{90} - D_{10}):	51389.2	8.369
(D_{75} / D_{25}):	99.39	-0.263
(D_{75} - D_{25}):	37763.0	6.635

GRAIN SIZE DISTRIBUTION

GRAVEL:	61.5%	COARSE SAND:	6.0%
SAND:	33.5%	MEDIUM SAND:	10.6%
MUD:	5.0%	FINE SAND:	12.5%
		V FINE SAND:	0.5%
V COARSE GRAVEL:	33.8%	V COARSE SILT:	0.6%
COARSE GRAVEL:	18.9%	COARSE SILT:	0.9%
MEDIUM GRAVEL:	1.9%	MEDIUM SILT:	1.4%
FINE GRAVEL:	3.4%	FINE SILT:	1.2%
V FINE GRAVEL:	3.4%	V FINE SILT:	0.6%
V COARSE SAND:	3.9%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	21486.6	4233.0	-2.082	5889.8	-2.558	Fine Gravel
SORTING (σ):	20649.2	13.24	3.727	10.65	3.413	Very Poorly Sorted
SKEWNESS (Sk):	0.219	-0.771	0.771	-0.698	0.698	Very Fine Skewed
KURTOSIS (K):	1.292	2.516	2.516	0.606	0.606	Very Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_78**

ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Trimodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Coarse Gravelly Medium Sand

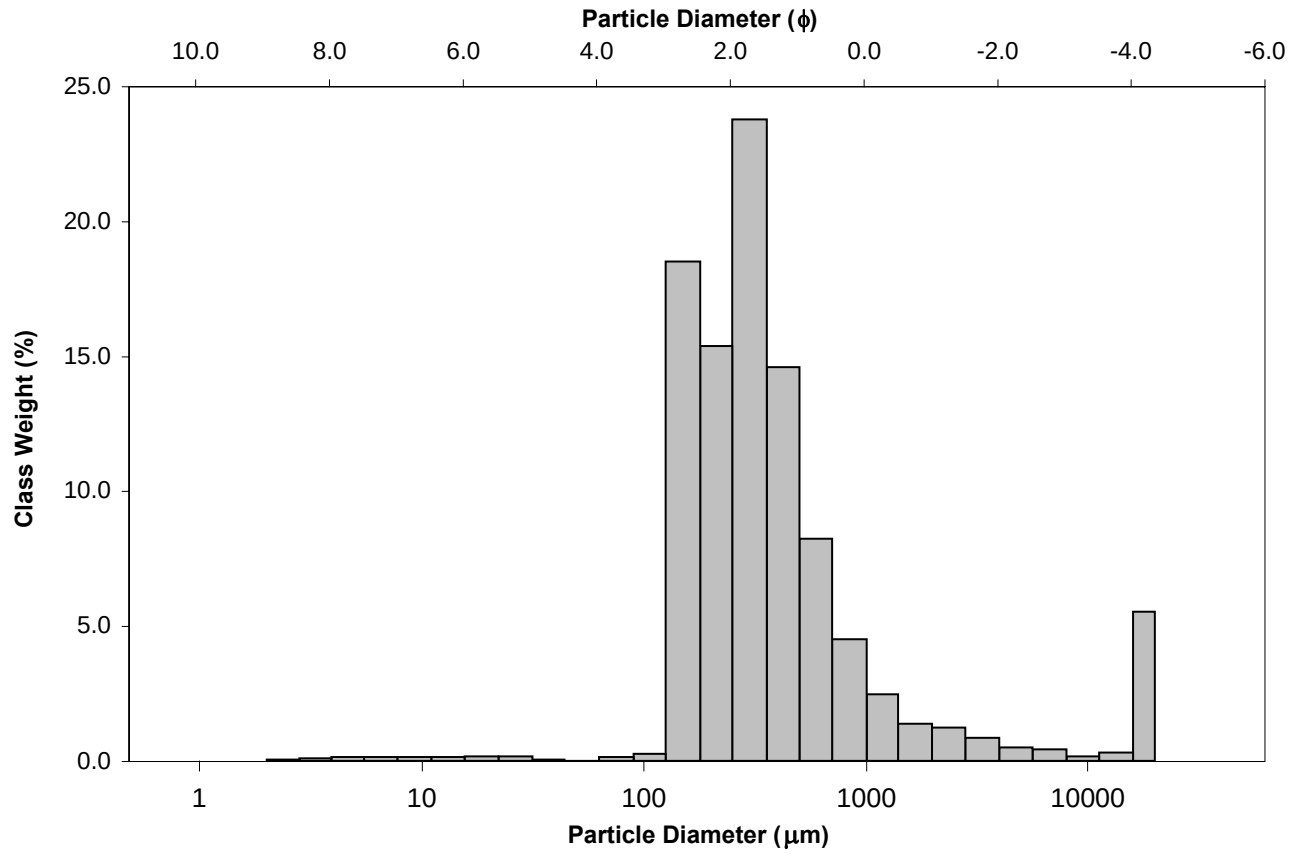
	μm	ϕ
MODE 1:	302.5	1.747
MODE 2:	152.5	2.737
MODE 3:	18000.0	-4.161
D_{10}:	145.6	-0.229
MEDIAN or D_{50}:	303.3	1.721
D_{90}:	1171.7	2.779
(D_{90} / D_{10}):	8.045	-12.156
(D_{90} - D_{10}):	1026.1	3.008
(D_{75} / D_{25}):	2.529	2.305
(D_{75} - D_{25}):	296.9	1.339

GRAIN SIZE DISTRIBUTION

GRAVEL:	7.2%	COARSE SAND:	13.1%
SAND:	91.5%	MEDIUM SAND:	39.3%
MUD:	1.2%	FINE SAND:	34.8%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.1%
COARSE GRAVEL:	3.6%	COARSE SILT:	0.4%
MEDIUM GRAVEL:	0.5%	MEDIUM SILT:	0.3%
FINE GRAVEL:	1.0%	FINE SILT:	0.3%
V FINE GRAVEL:	2.1%	V FINE SILT:	0.2%
V COARSE SAND:	3.9%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	1177.7	373.4	1.421	325.9	1.618	Medium Sand
SORTING (σ):	3447.5	3.101	1.633	2.444	1.289	Poorly Sorted
SKEWNESS (Sk):	4.423	1.347	-1.347	0.337	-0.337	Very Coarse Skewed
KURTOSIS (K):	21.30	7.780	7.780	1.540	1.540	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_79** ANALYST & DATE: MjGrey, 12/5/2012

SAMPLE TYPE: Bimodal, Moderately Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

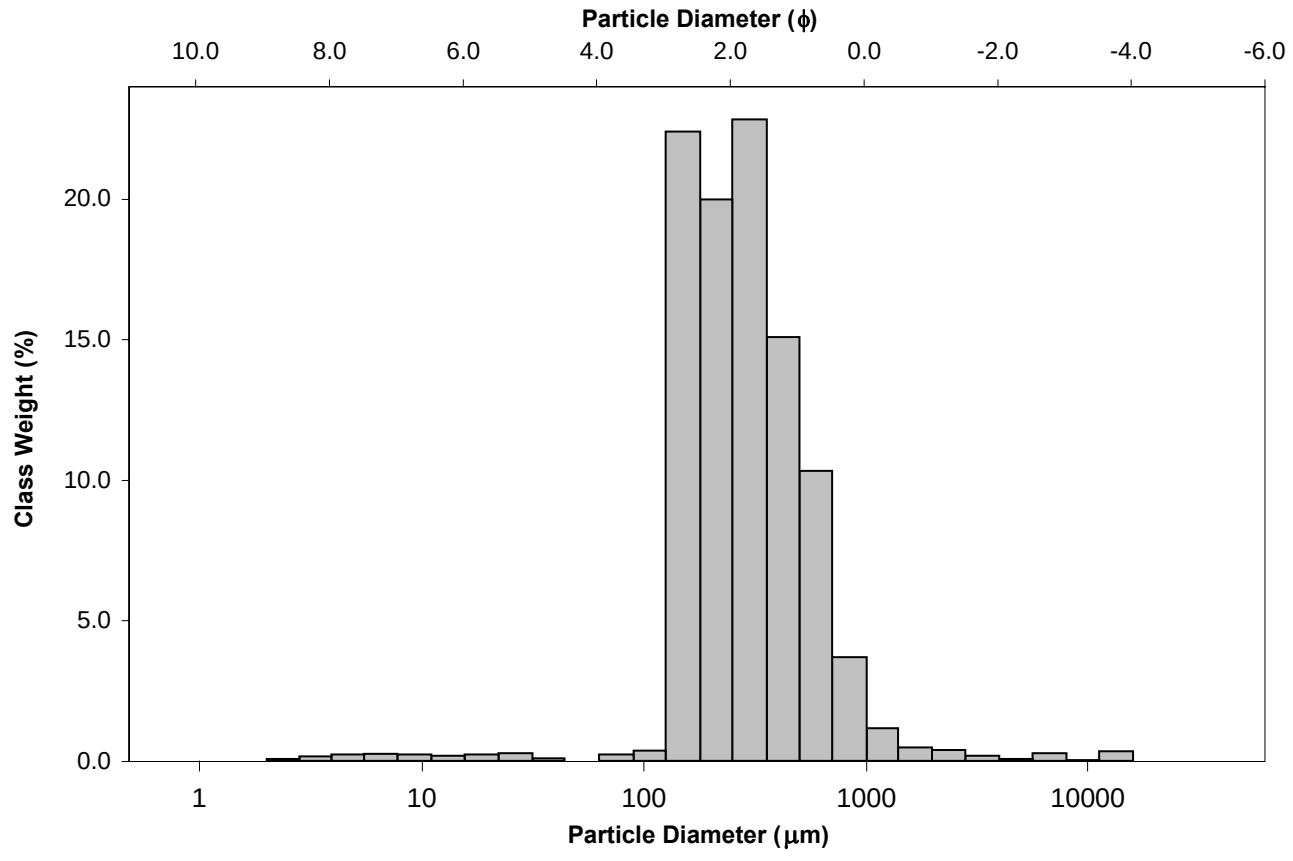
	μm	ϕ
MODE 1:	302.5	1.747
MODE 2:	152.5	2.737
MODE 3:		
D_{10}:	140.8	0.658
MEDIAN or D_{50}:	270.2	1.888
D_{90}:	633.7	2.829
(D_{90} / D_{10}):	4.502	4.299
(D_{90} - D_{10}):	493.0	2.171
(D_{75} / D_{25}):	2.348	1.975
(D_{75} - D_{25}):	239.3	1.232

GRAIN SIZE DISTRIBUTION

GRAVEL:	1.3%	COARSE SAND:	14.1%
SAND:	96.9%	MEDIUM SAND:	38.1%
MUD:	1.8%	FINE SAND:	42.6%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.1%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.5%
MEDIUM GRAVEL:	0.4%	MEDIUM SILT:	0.4%
FINE GRAVEL:	0.4%	FINE SILT:	0.5%
V FINE GRAVEL:	0.6%	V FINE SILT:	0.2%
V COARSE SAND:	1.6%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	415.8	278.3	1.845	278.6	1.844	Medium Sand
SORTING (σ):	912.9	2.179	1.124	1.790	0.840	Moderately Sorted
SKEWNESS (Sk):	11.69	-0.553	0.553	0.143	-0.143	Coarse Skewed
KURTOSIS (K):	158.0	11.99	11.99	0.886	0.886	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_80**

ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Polymodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Very Fine Gravelly Fine Sand

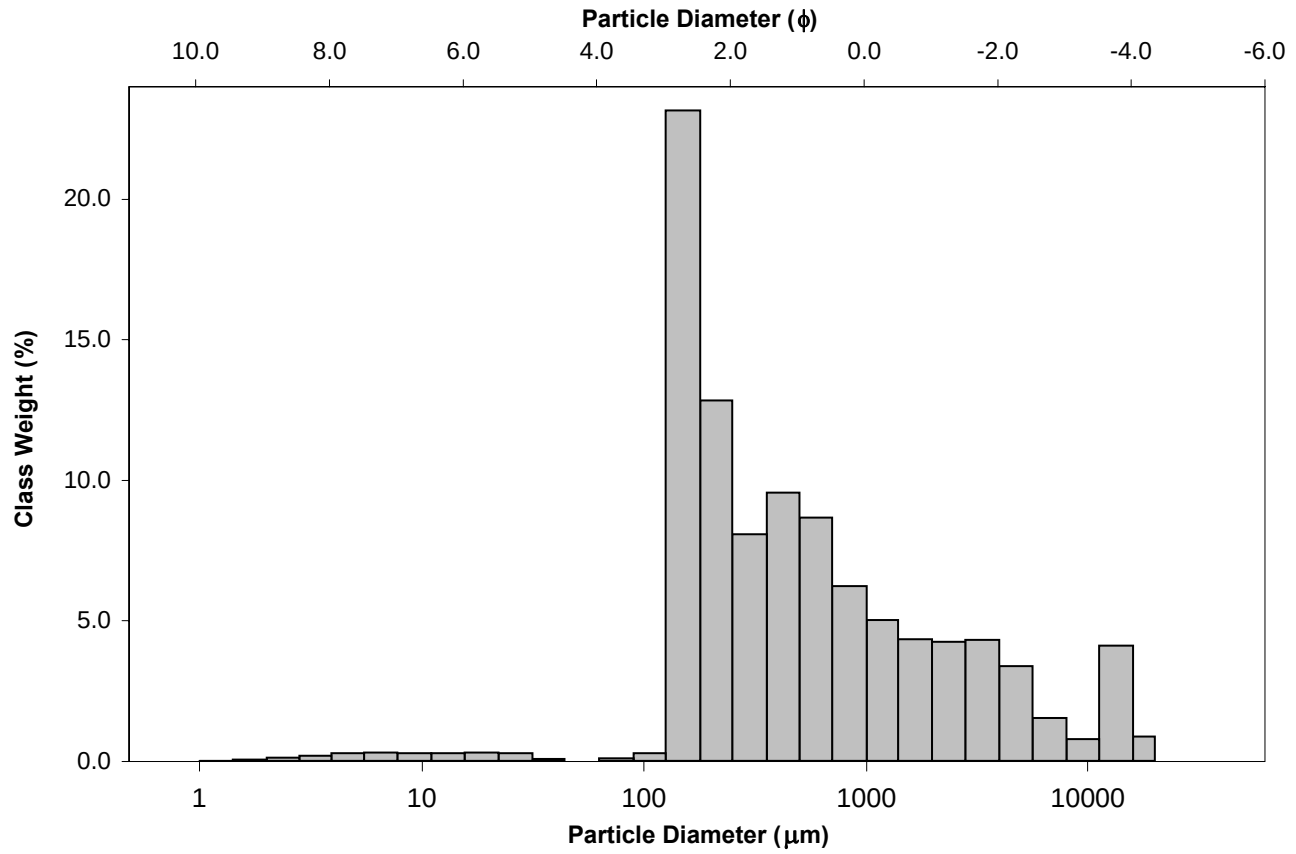
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:	427.5	1.247
MODE 3:	3400.0	-1.743
D_{10}:	139.8	-2.061
MEDIAN or D_{50}:	391.8	1.352
D_{90}:	4172.2	2.839
(D_{90} / D_{10}):	29.85	-1.377
(D_{90} - D_{10}):	4032.4	4.899
(D_{75} / D_{25}):	7.192	-7.589
(D_{75} - D_{25}):	1083.3	2.846

GRAIN SIZE DISTRIBUTION

GRAVEL:	19.0%	COARSE SAND:	14.9%
SAND:	78.9%	MEDIUM SAND:	17.7%
MUD:	2.1%	FINE SAND:	36.6%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.1%
COARSE GRAVEL:	0.6%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	5.0%	MEDIUM SILT:	0.5%
FINE GRAVEL:	4.8%	FINE SILT:	0.6%
V FINE GRAVEL:	8.6%	V FINE SILT:	0.3%
V COARSE SAND:	9.4%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	1635.0	520.0	0.944	534.5	0.904	Coarse Sand
SORTING (σ):	3201.1	4.242	2.085	3.920	1.971	Poorly Sorted
SKEWNESS (Sk):	3.139	0.273	-0.273	0.413	-0.413	Very Coarse Skewed
KURTOSIS (K):	12.59	3.793	3.793	0.908	0.908	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_82**

ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Bimodal, Moderately Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

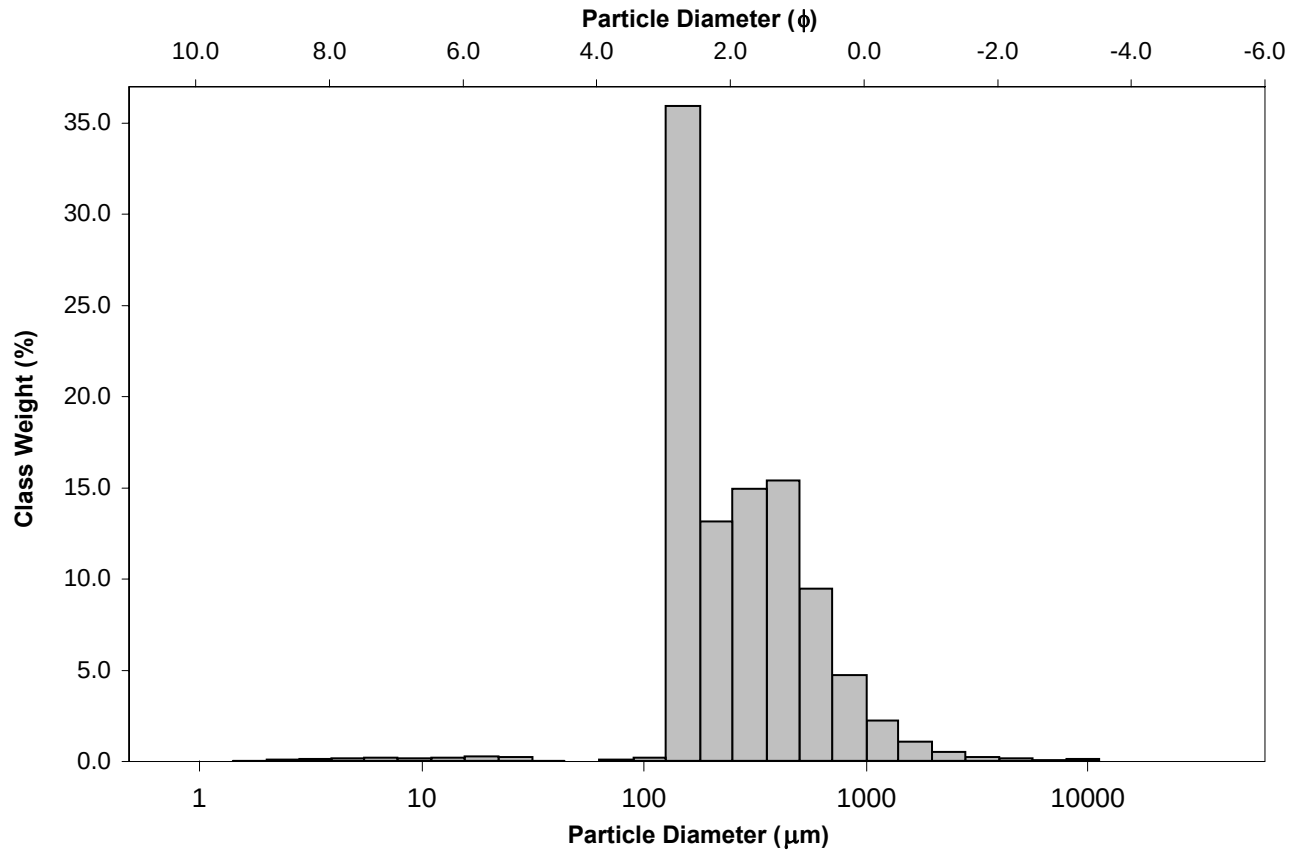
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:	427.5	1.247
MODE 3:		
D_{10}:	135.5	0.552
MEDIAN or D_{50}:	240.1	2.059
D_{90}:	681.9	2.883
(D_{90} / D_{10}):	5.032	5.220
(D_{90} - D_{10}):	546.4	2.331
(D_{75} / D_{25}):	2.745	2.198
(D_{75} - D_{25}):	273.6	1.457

GRAIN SIZE DISTRIBUTION

GRAVEL:	1.0%	COARSE SAND:	14.1%
SAND:	97.6%	MEDIUM SAND:	30.1%
MUD:	1.4%	FINE SAND:	49.8%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.5%
MEDIUM GRAVEL:	0.1%	MEDIUM SILT:	0.4%
FINE GRAVEL:	0.2%	FINE SILT:	0.3%
V FINE GRAVEL:	0.7%	V FINE SILT:	0.2%
V COARSE SAND:	3.3%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	377.6	266.9	1.906	266.1	1.910	Medium Sand
SORTING (σ):	523.5	2.178	1.123	1.889	0.918	Moderately Sorted
SKEWNESS (Sk):	9.756	-0.395	0.395	0.305	-0.305	Very Coarse Skewed
KURTOSIS (K):	144.6	8.594	8.594	0.809	0.809	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_84**

ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

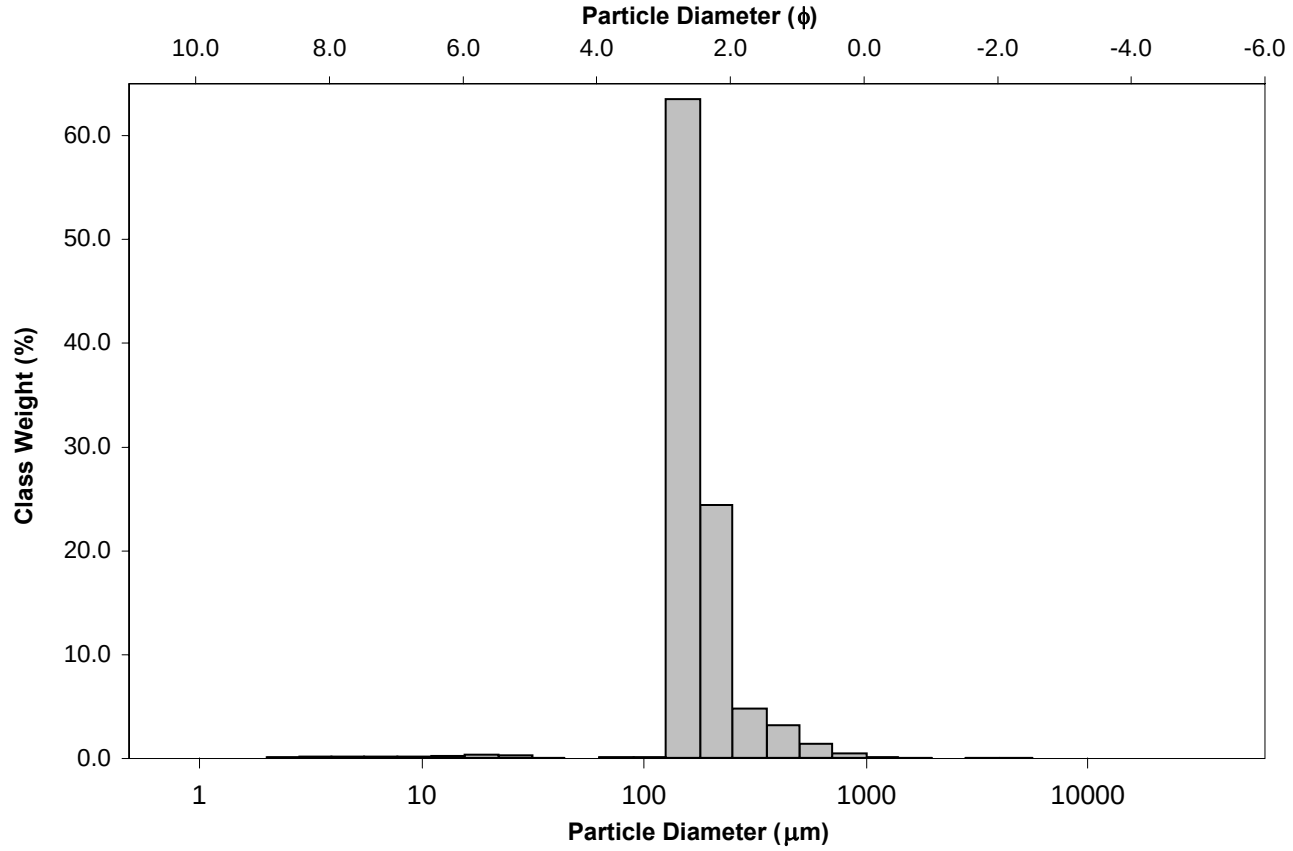
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.9	2.004
MEDIAN or D_{50}:	163.4	2.613
D_{90}:	249.4	2.934
(D_{90} / D_{10}):	1.905	1.464
(D_{90} - D_{10}):	118.5	0.930
(D_{75} / D_{25}):	1.412	1.215
(D_{75} - D_{25}):	58.57	0.497

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.0%	COARSE SAND:	1.8%
SAND:	98.4%	MEDIUM SAND:	7.8%
MUD:	1.5%	FINE SAND:	88.5%
		V FINE SAND:	0.2%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.4%
FINE GRAVEL:	0.0%	FINE SILT:	0.3%
V FINE GRAVEL:	0.0%	V FINE SILT:	0.2%
V COARSE SAND:	0.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	192.7	171.4	2.545	171.6	2.543	Fine Sand
SORTING (σ):	130.7	1.613	0.690	1.333	0.415	Well Sorted
SKEWNESS (Sk):	15.42	-2.651	2.651	0.398	-0.398	Very Coarse Skewed
KURTOSIS (K):	449.0	27.69	27.69	1.227	1.227	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_85** ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

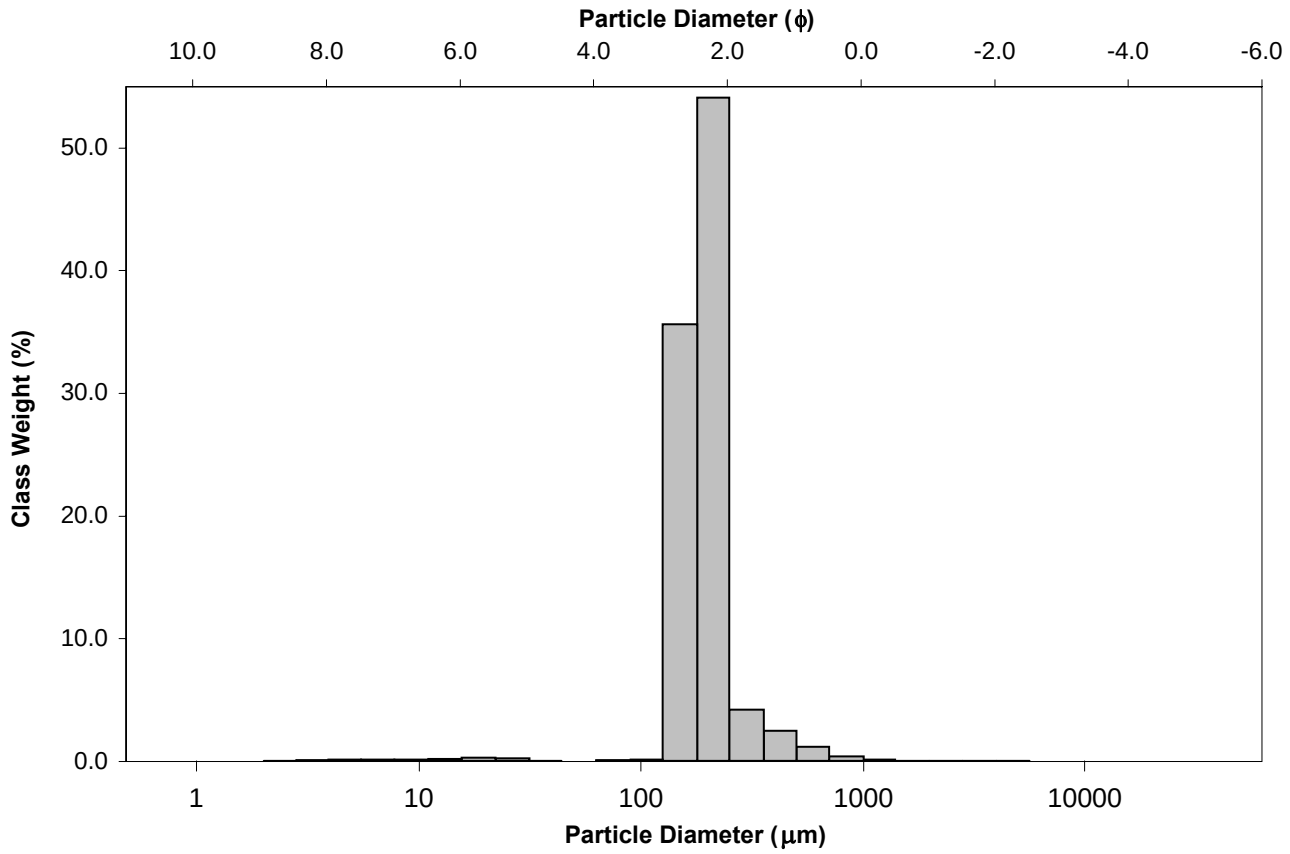
	μm	ϕ
MODE 1:	215.0	2.237
MODE 2:		
MODE 3:		
D_{10}:	135.7	2.013
MEDIAN or D_{50}:	192.4	2.378
D_{90}:	247.8	2.882
(D_{90} / D_{10}):	1.826	1.432
(D_{90} - D_{10}):	112.1	0.869
(D_{75} / D_{25}):	1.438	1.244
(D_{75} - D_{25}):	68.68	0.524

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	1.6%
SAND:	98.7%	MEDIUM SAND:	6.8%
MUD:	1.3%	FINE SAND:	90.0%
		V FINE SAND:	0.2%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.5%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.3%
FINE GRAVEL:	0.0%	FINE SILT:	0.3%
V FINE GRAVEL:	0.0%	V FINE SILT:	0.1%
V COARSE SAND:	0.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	208.2	188.7	2.405	187.5	2.415	Fine Sand
SORTING (σ):	124.4	1.557	0.639	1.311	0.391	Well Sorted
SKEWNESS (Sk):	15.98	-3.187	3.187	0.006	-0.006	Symmetrical
KURTOSIS (K):	473.3	33.23	33.23	1.073	1.073	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_86** ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Very Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

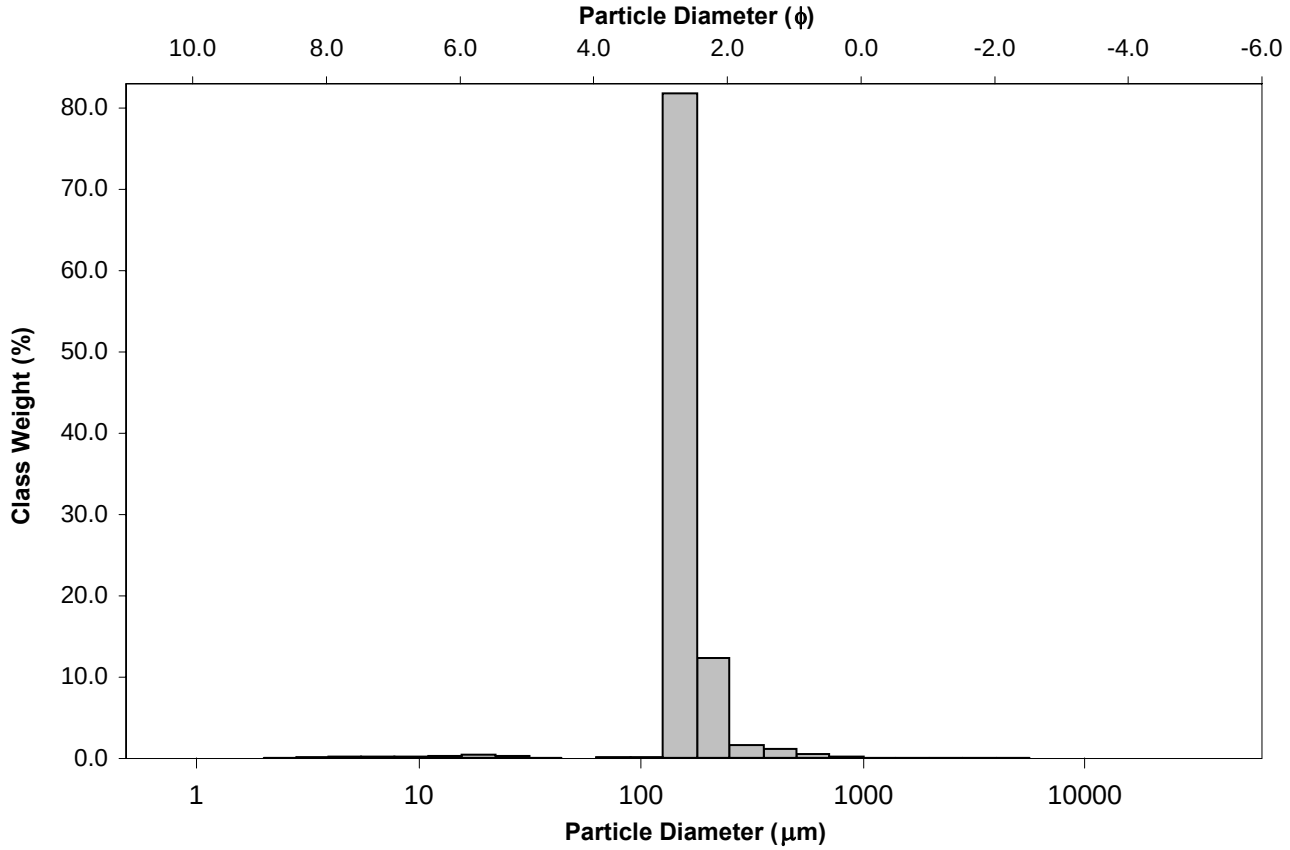
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	129.5	2.276
MEDIAN or D_{50}:	154.3	2.696
D_{90}:	206.4	2.949
(D_{90} / D_{10}):	1.594	1.295
(D_{90} - D_{10}):	76.91	0.672
(D_{75} / D_{25}):	1.244	1.124
(D_{75} - D_{25}):	33.80	0.315

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.7%
SAND:	98.3%	MEDIUM SAND:	2.6%
MUD:	1.6%	FINE SAND:	94.7%
		V FINE SAND:	0.2%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.7%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.4%
FINE GRAVEL:	0.0%	FINE SILT:	0.4%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.2%
V COARSE SAND:	0.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	169.3	154.6	2.694	154.3	2.696	Fine Sand
SORTING (σ):	119.9	1.528	0.612	1.186	0.246	Very Well Sorted
SKEWNESS (Sk):	23.33	-4.084	4.084	0.189	-0.189	Coarse Skewed
KURTOSIS (K):	761.6	42.24	42.24	1.186	1.186	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_87** ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

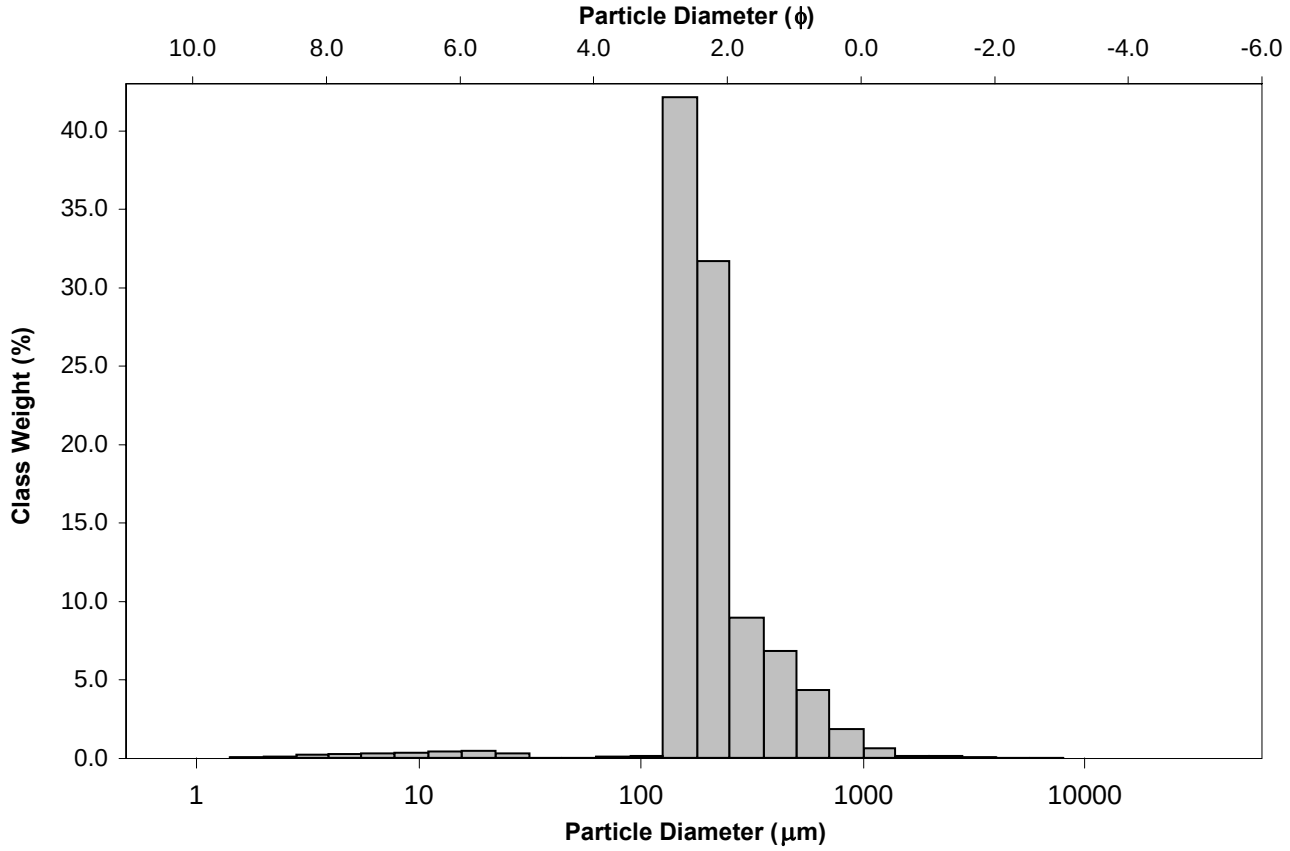
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	132.7	1.204
MEDIAN or D_{50}:	185.9	2.427
D_{90}:	434.1	2.914
(D_{90} / D_{10}):	3.273	2.421
(D_{90} - D_{10}):	301.5	1.710
(D_{75} / D_{25}):	1.629	1.347
(D_{75} - D_{25}):	94.46	0.704

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	6.2%
SAND:	97.2%	MEDIUM SAND:	15.8%
MUD:	2.5%	FINE SAND:	74.2%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.7%
FINE GRAVEL:	0.0%	FINE SILT:	0.6%
V FINE GRAVEL:	0.2%	V FINE SILT:	0.3%
V COARSE SAND:	0.8%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	249.3	198.7	2.331	204.1	2.293	Fine Sand
SORTING (σ):	242.3	1.986	0.990	1.566	0.647	Moderately Well Sorted
SKEWNESS (Sk):	10.21	-1.793	1.793	0.418	-0.418	Very Coarse Skewed
KURTOSIS (K):	197.6	15.04	15.04	1.298	1.298	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_90** ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Bimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

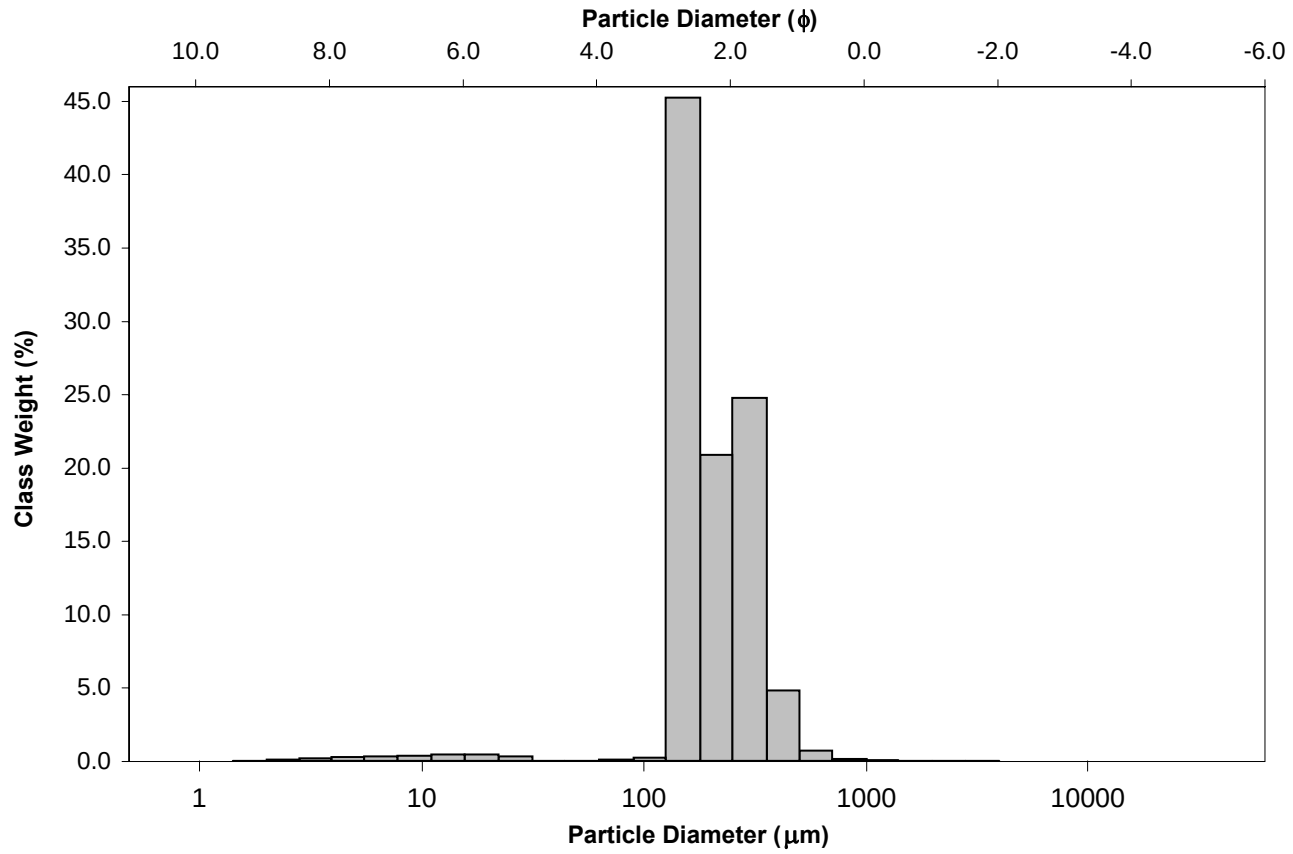
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:	302.5	1.747
MODE 3:		
D_{10}:	132.1	1.582
MEDIAN or D_{50}:	180.2	2.473
D_{90}:	333.9	2.920
(D_{90} / D_{10}):	2.527	1.845
(D_{90} - D_{10}):	201.8	1.338
(D_{75} / D_{25}):	1.820	1.457
(D_{75} - D_{25}):	121.7	0.864

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.8%
SAND:	97.4%	MEDIUM SAND:	29.5%
MUD:	2.5%	FINE SAND:	66.7%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.8%
FINE GRAVEL:	0.0%	FINE SILT:	0.6%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.3%
V COARSE SAND:	0.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	217.9	189.2	2.402	197.0	2.344	Fine Sand
SORTING (σ):	117.9	1.828	0.870	1.436	0.522	Moderately Well Sorted
SKEWNESS (Sk):	8.560	-3.185	3.185	0.345	-0.345	Very Coarse Skewed
KURTOSIS (K):	187.0	21.01	21.01	0.737	0.737	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_92**

ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

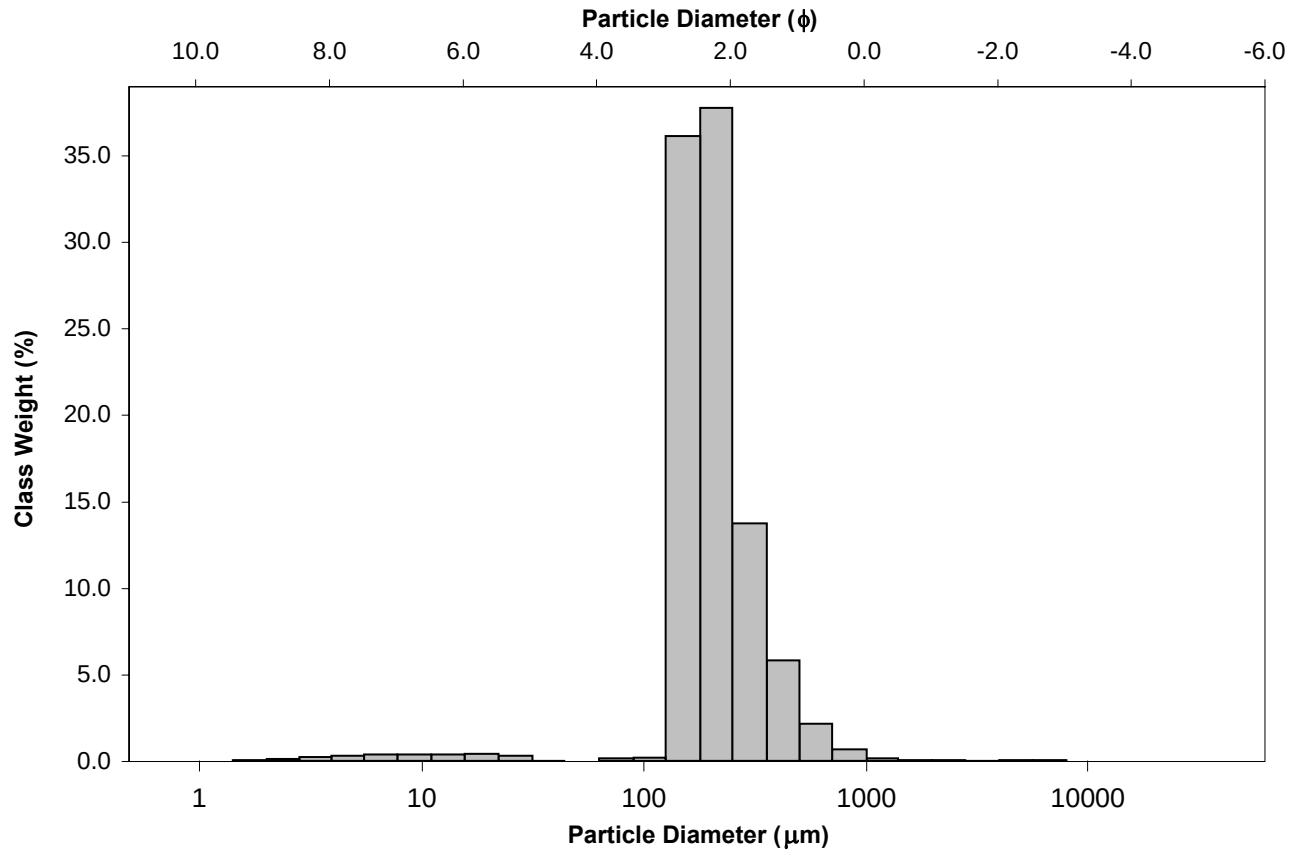
	μm	ϕ
MODE 1:	215.0	2.237
MODE 2:		
MODE 3:		
D_{10}:	133.7	1.530
MEDIAN or D_{50}:	195.3	2.356
D_{90}:	346.4	2.903
(D_{90} / D_{10}):	2.590	1.898
(D_{90} - D_{10}):	212.6	1.373
(D_{75} / D_{25}):	1.590	1.330
(D_{75} - D_{25}):	91.11	0.669

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	2.9%
SAND:	97.3%	MEDIUM SAND:	19.7%
MUD:	2.5%	FINE SAND:	74.1%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.7%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.7%
FINE GRAVEL:	0.1%	FINE SILT:	0.7%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.4%
V COARSE SAND:	0.2%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	232.9	194.2	2.364	202.0	2.308	Fine Sand
SORTING (σ):	231.5	1.903	0.928	1.458	0.544	Moderately Well Sorted
SKEWNESS (Sk):	17.56	-2.757	2.757	0.230	-0.230	Coarse Skewed
KURTOSIS (K):	434.0	20.36	20.36	1.116	1.116	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_93** ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

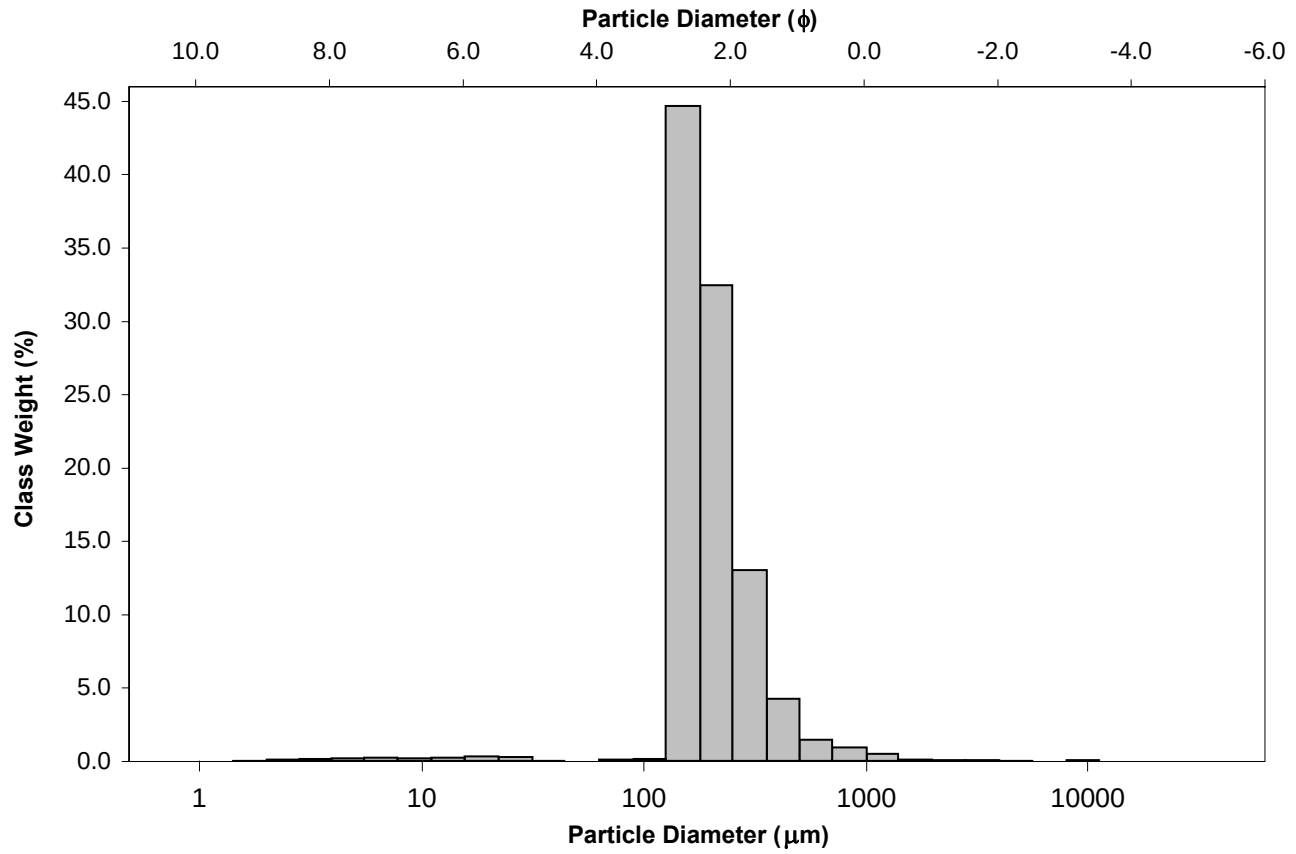
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	132.9	1.598
MEDIAN or D_{50}:	182.1	2.457
D_{90}:	330.4	2.911
(D_{90} / D_{10}):	2.485	1.822
(D_{90} - D_{10}):	197.5	1.313
(D_{75} / D_{25}):	1.593	1.325
(D_{75} - D_{25}):	88.66	0.672

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	2.4%
SAND:	98.0%	MEDIUM SAND:	17.3%
MUD:	1.8%	FINE SAND:	77.5%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	0.1%	MEDIUM SILT:	0.5%
FINE GRAVEL:	0.0%	FINE SILT:	0.4%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.2%
V COARSE SAND:	0.6%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	228.7	191.3	2.386	192.6	2.377	Fine Sand
SORTING (σ):	278.4	1.775	0.828	1.432	0.518	Moderately Well Sorted
SKEWNESS (Sk):	22.66	-2.025	2.025	0.326	-0.326	Very Coarse Skewed
KURTOSIS (K):	704.6	21.36	21.36	1.064	1.064	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_94**

ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

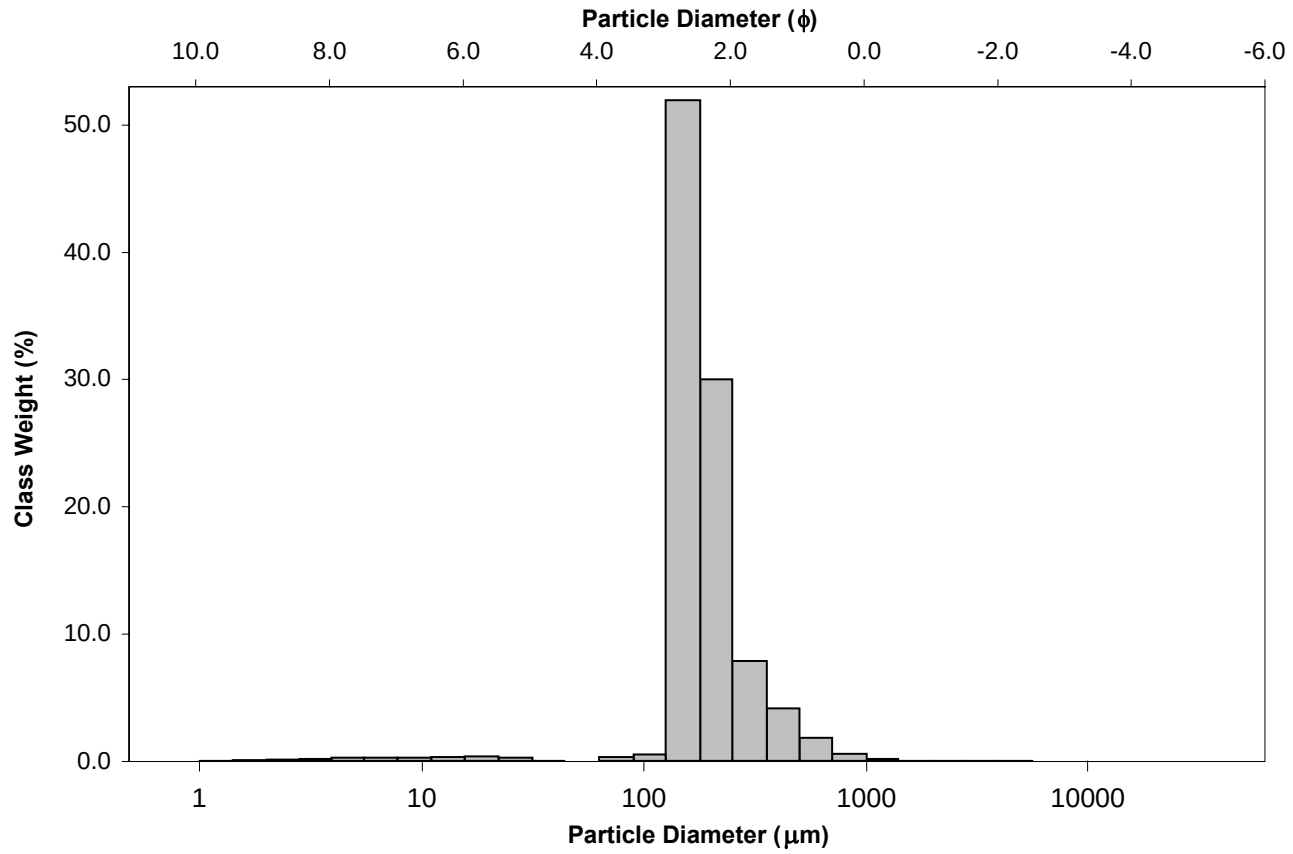
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.0	1.704
MEDIAN or D_{50}:	171.5	2.544
D_{90}:	306.9	2.932
(D_{90} / D_{10}):	2.342	1.721
(D_{90} - D_{10}):	175.9	1.228
(D_{75} / D_{25}):	1.528	1.281
(D_{75} - D_{25}):	76.55	0.612

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	2.3%
SAND:	97.7%	MEDIUM SAND:	12.0%
MUD:	2.2%	FINE SAND:	82.4%
		V FINE SAND:	0.8%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.6%
FINE GRAVEL:	0.0%	FINE SILT:	0.6%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.3%
V COARSE SAND:	0.2%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	207.1	177.8	2.491	179.2	2.480	Fine Sand
SORTING (σ):	156.0	1.795	0.844	1.385	0.469	Well Sorted
SKEWNESS (Sk):	13.31	-2.867	2.867	0.354	-0.354	Very Coarse Skewed
KURTOSIS (K):	318.6	22.95	22.95	1.136	1.136	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_95**

ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

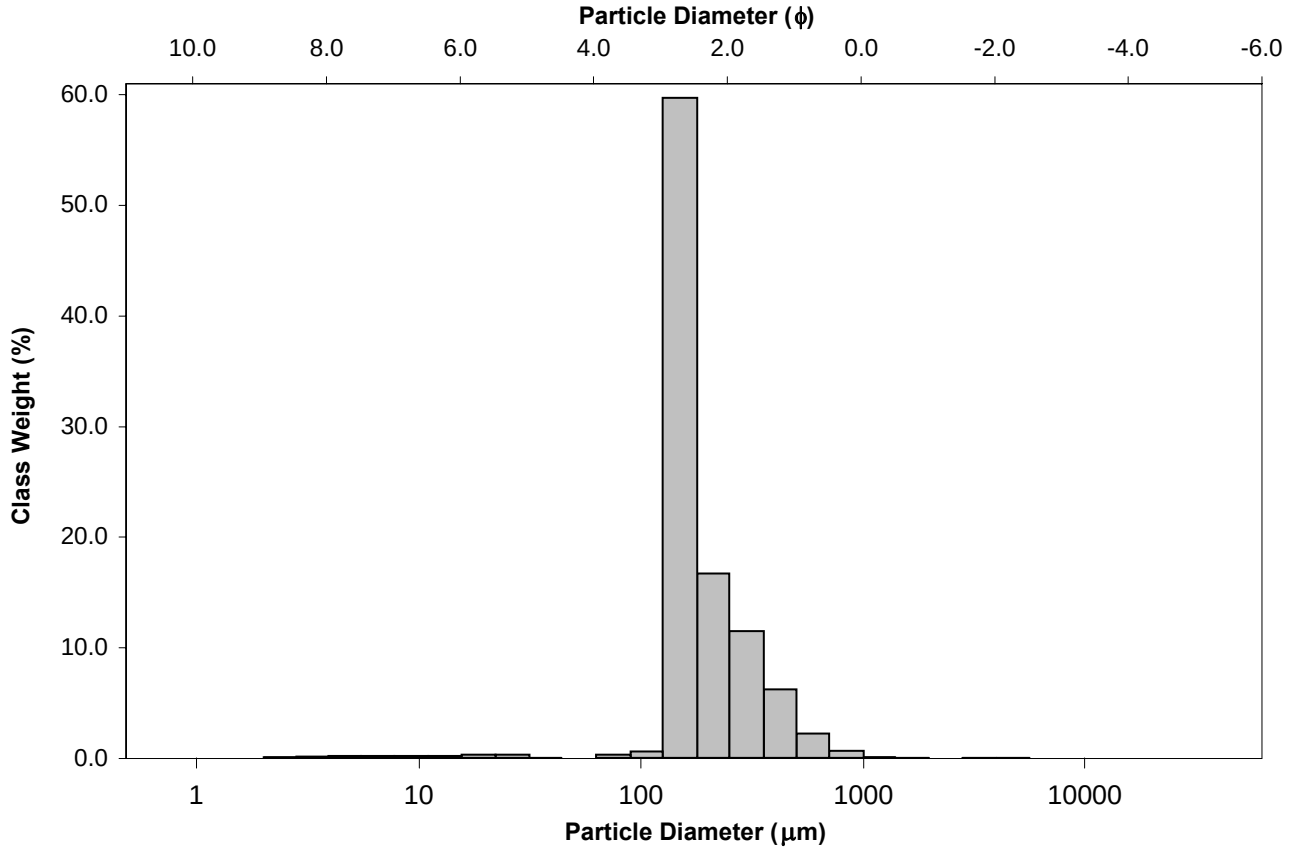
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.7	1.537
MEDIAN or D_{50}:	165.6	2.594
D_{90}:	344.7	2.935
(D_{90} / D_{10}):	2.636	1.910
(D_{90} - D_{10}):	213.9	1.399
(D_{75} / D_{25}):	1.589	1.312
(D_{75} - D_{25}):	84.12	0.668

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	2.8%
SAND:	98.3%	MEDIUM SAND:	17.4%
MUD:	1.6%	FINE SAND:	77.1%
		V FINE SAND:	0.8%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.4%
FINE GRAVEL:	0.0%	FINE SILT:	0.4%
V FINE GRAVEL:	0.0%	V FINE SILT:	0.2%
V COARSE SAND:	0.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	211.4	182.1	2.457	186.0	2.427	Fine Sand
SORTING (σ):	156.7	1.717	0.780	1.459	0.545	Moderately Well Sorted
SKEWNESS (Sk):	12.66	-1.926	1.926	0.520	-0.520	Very Coarse Skewed
KURTOSIS (K):	312.9	19.40	19.40	1.113	1.113	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_97** ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Bimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

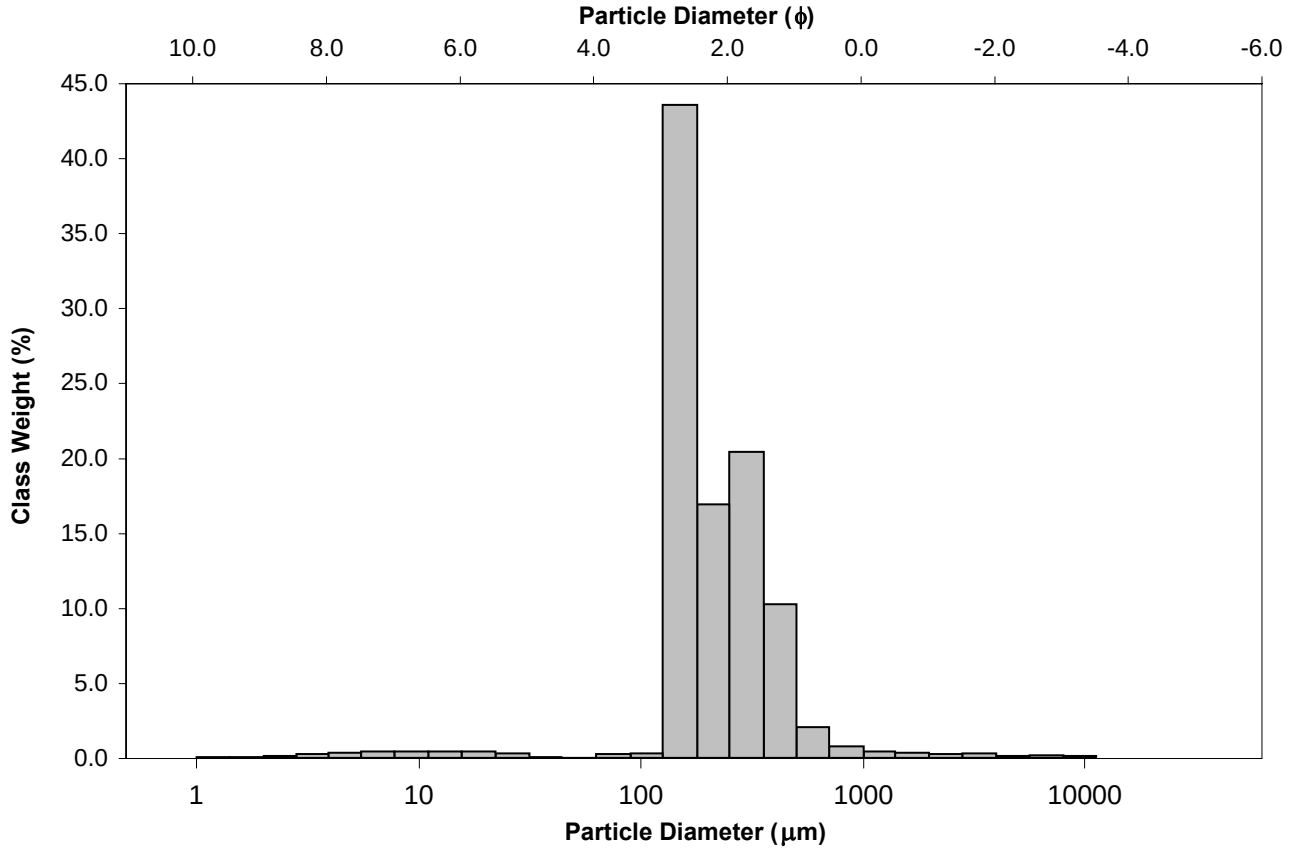
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:	302.5	1.747
MODE 3:		
D_{10}:	131.5	1.262
MEDIAN or D_{50}:	183.7	2.444
D_{90}:	417.0	2.927
(D_{90} / D_{10}):	3.170	2.319
(D_{90} - D_{10}):	285.5	1.665
(D_{75} / D_{25}):	2.005	1.574
(D_{75} - D_{25}):	149.1	1.004

GRAIN SIZE DISTRIBUTION

GRAVEL:	1.1%	COARSE SAND:	2.9%
SAND:	95.9%	MEDIUM SAND:	30.5%
MUD:	3.0%	FINE SAND:	61.2%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.1%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.7%
MEDIUM GRAVEL:	0.2%	MEDIUM SILT:	0.9%
FINE GRAVEL:	0.3%	FINE SILT:	0.8%
V FINE GRAVEL:	0.6%	V FINE SILT:	0.4%
V COARSE SAND:	0.7%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	291.1	203.0	2.301	206.5	2.276	Fine Sand
SORTING (σ):	566.8	2.210	1.144	1.549	0.631	Moderately Well Sorted
SKEWNESS (Sk):	11.53	-1.447	1.447	0.416	-0.416	Very Coarse Skewed
KURTOSIS (K):	160.7	14.56	14.56	0.804	0.804	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_99** ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Moderately Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

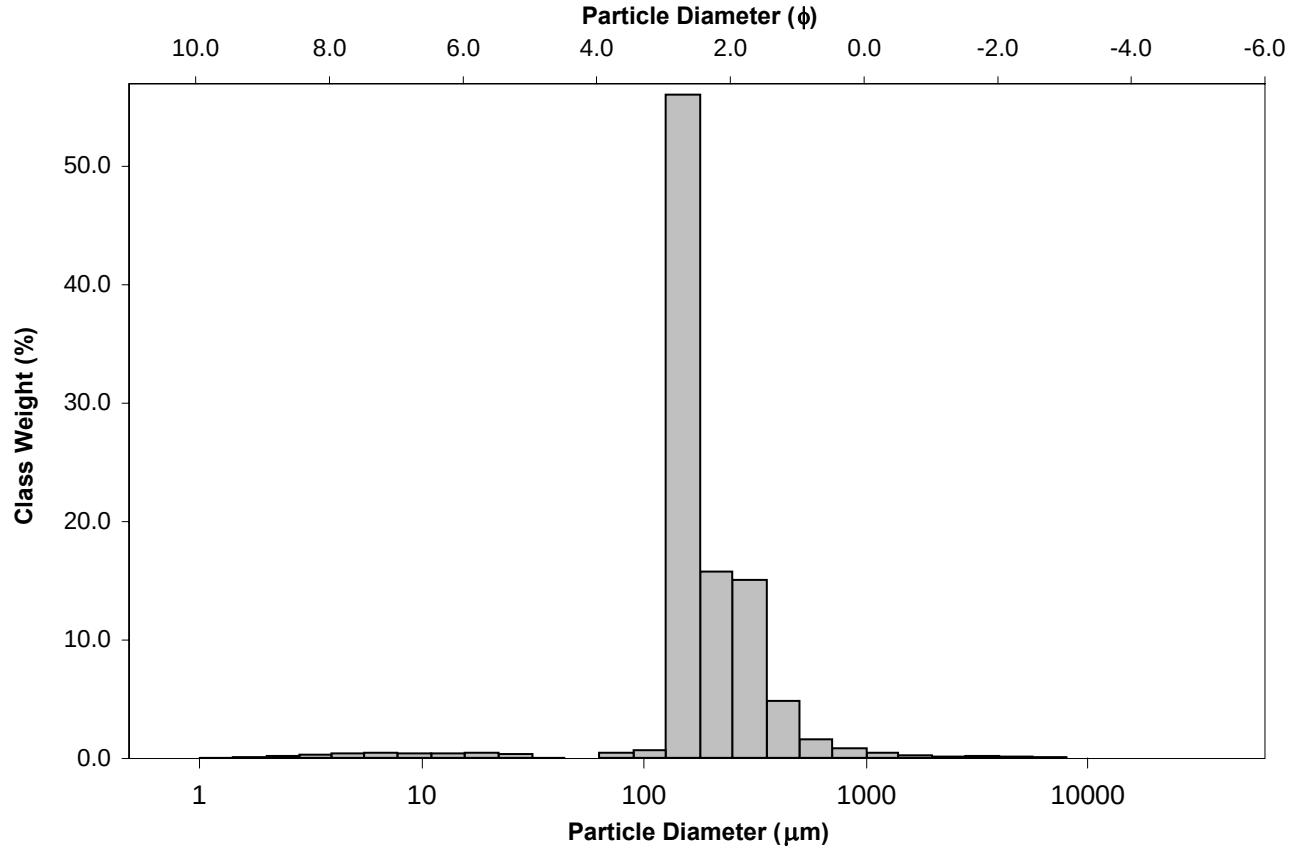
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	129.7	1.552
MEDIAN or D_{50}:	166.9	2.583
D_{90}:	341.1	2.946
(D_{90} / D_{10}):	2.629	1.899
(D_{90} - D_{10}):	211.4	1.395
(D_{75} / D_{25}):	1.687	1.367
(D_{75} - D_{25}):	98.01	0.755

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.5%	COARSE SAND:	2.3%
SAND:	96.4%	MEDIUM SAND:	19.7%
MUD:	3.0%	FINE SAND:	72.6%
		V FINE SAND:	1.1%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.9%
FINE GRAVEL:	0.2%	FINE SILT:	0.8%
V FINE GRAVEL:	0.3%	V FINE SILT:	0.4%
V COARSE SAND:	0.7%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	235.1	179.3	2.479	188.2	2.410	Fine Sand
SORTING (σ):	343.2	2.056	1.040	1.478	0.564	Moderately Well Sorted
SKEWNESS (Sk):	12.25	-1.848	1.848	0.507	-0.507	Very Coarse Skewed
KURTOSIS (K):	194.1	16.13	16.13	1.002	1.002	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_100**

ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Very Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

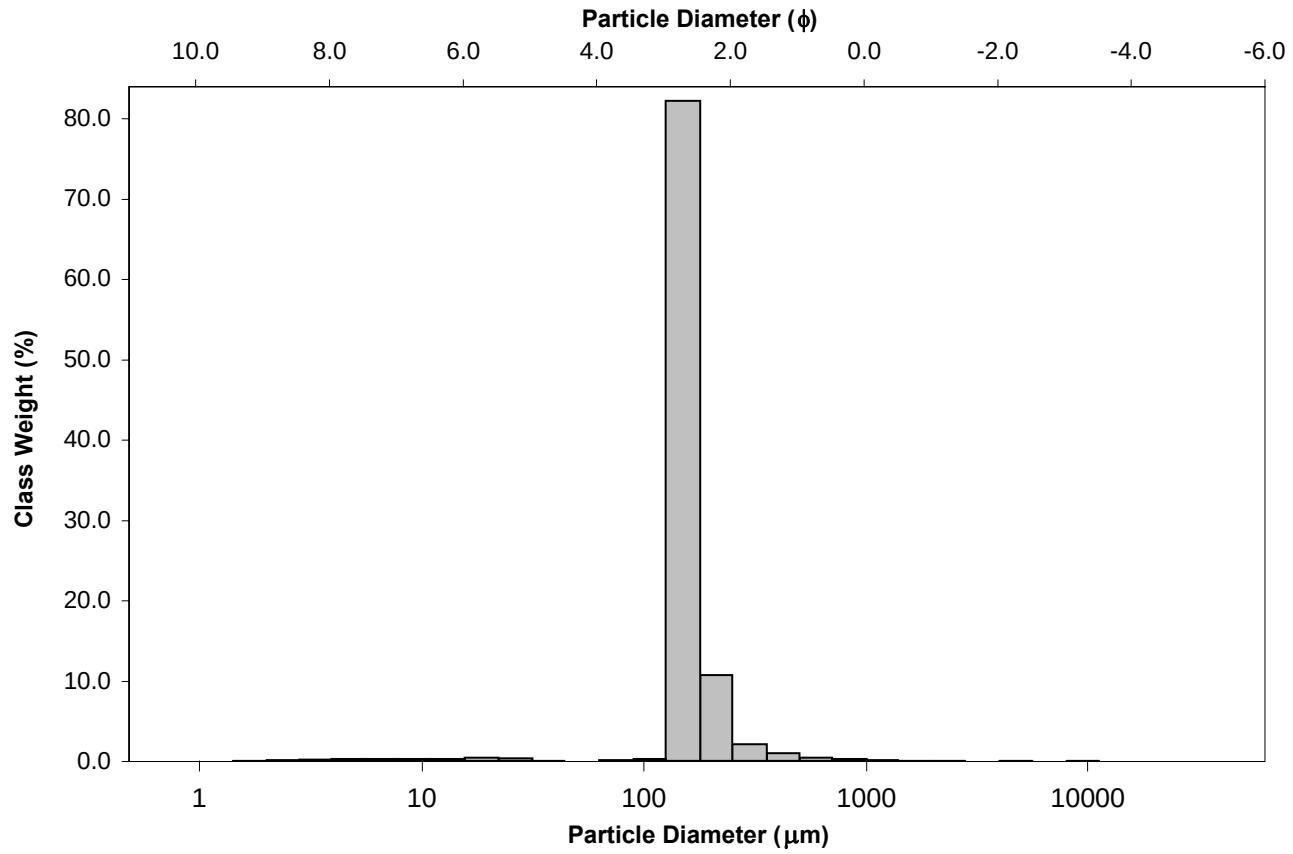
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	129.2	2.288
MEDIAN or D_{50}:	153.8	2.701
D_{90}:	204.7	2.953
(D_{90} / D_{10}):	1.585	1.290
(D_{90} - D_{10}):	75.54	0.664
(D_{75} / D_{25}):	1.243	1.124
(D_{75} - D_{25}):	33.56	0.314

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.2%	COARSE SAND:	0.7%
SAND:	97.7%	MEDIUM SAND:	3.0%
MUD:	2.1%	FINE SAND:	93.5%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.1%	MEDIUM SILT:	0.6%
FINE GRAVEL:	0.1%	FINE SILT:	0.5%
V FINE GRAVEL:	0.0%	V FINE SILT:	0.3%
V COARSE SAND:	0.2%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	177.2	152.8	2.710	153.8	2.701	Fine Sand
SORTING (σ):	286.6	1.642	0.716	1.188	0.249	Very Well Sorted
SKEWNESS (Sk):	26.96	-3.201	3.201	0.199	-0.199	Coarse Skewed
KURTOSIS (K):	829.5	35.54	35.54	1.223	1.223	Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_101** ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Very Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

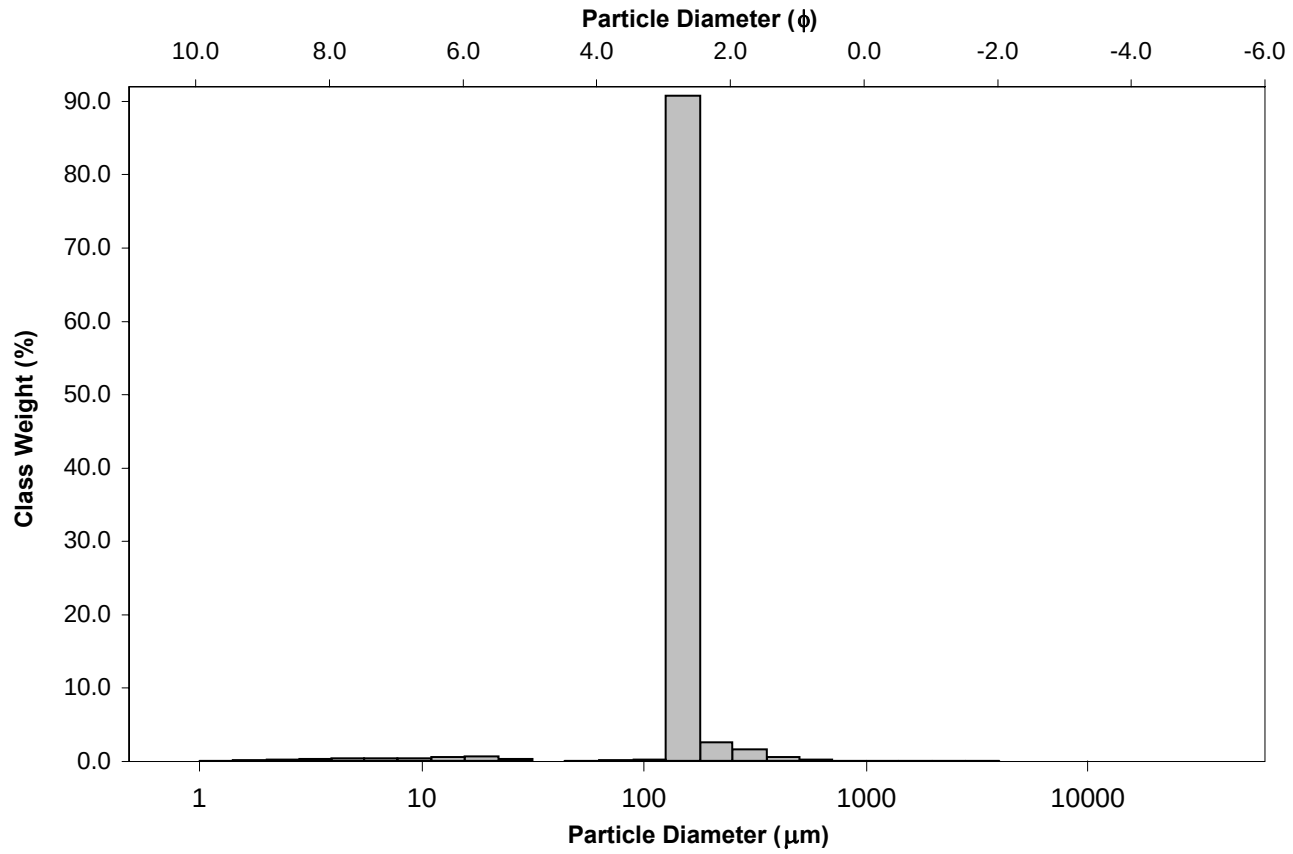
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	128.3	2.504
MEDIAN or D_{50}:	150.4	2.733
D_{90}:	176.3	2.963
(D_{90} / D_{10}):	1.375	1.183
(D_{90} - D_{10}):	48.05	0.459
(D_{75} / D_{25}):	1.220	1.111
(D_{75} - D_{25}):	29.96	0.287

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.3%
SAND:	96.8%	MEDIUM SAND:	2.1%
MUD:	3.2%	FINE SAND:	94.0%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.9%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.9%
FINE GRAVEL:	0.0%	FINE SILT:	0.8%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.5%
V COARSE SAND:	0.1%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	157.6	141.3	2.823	150.4	2.733	Fine Sand
SORTING (σ):	96.24	1.736	0.796	1.130	0.176	Very Well Sorted
SKEWNESS (Sk):	20.37	-4.686	4.686	0.000	0.000	Symmetrical
KURTOSIS (K):	571.7	31.82	31.82	0.738	0.738	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_102** ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Very Well Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

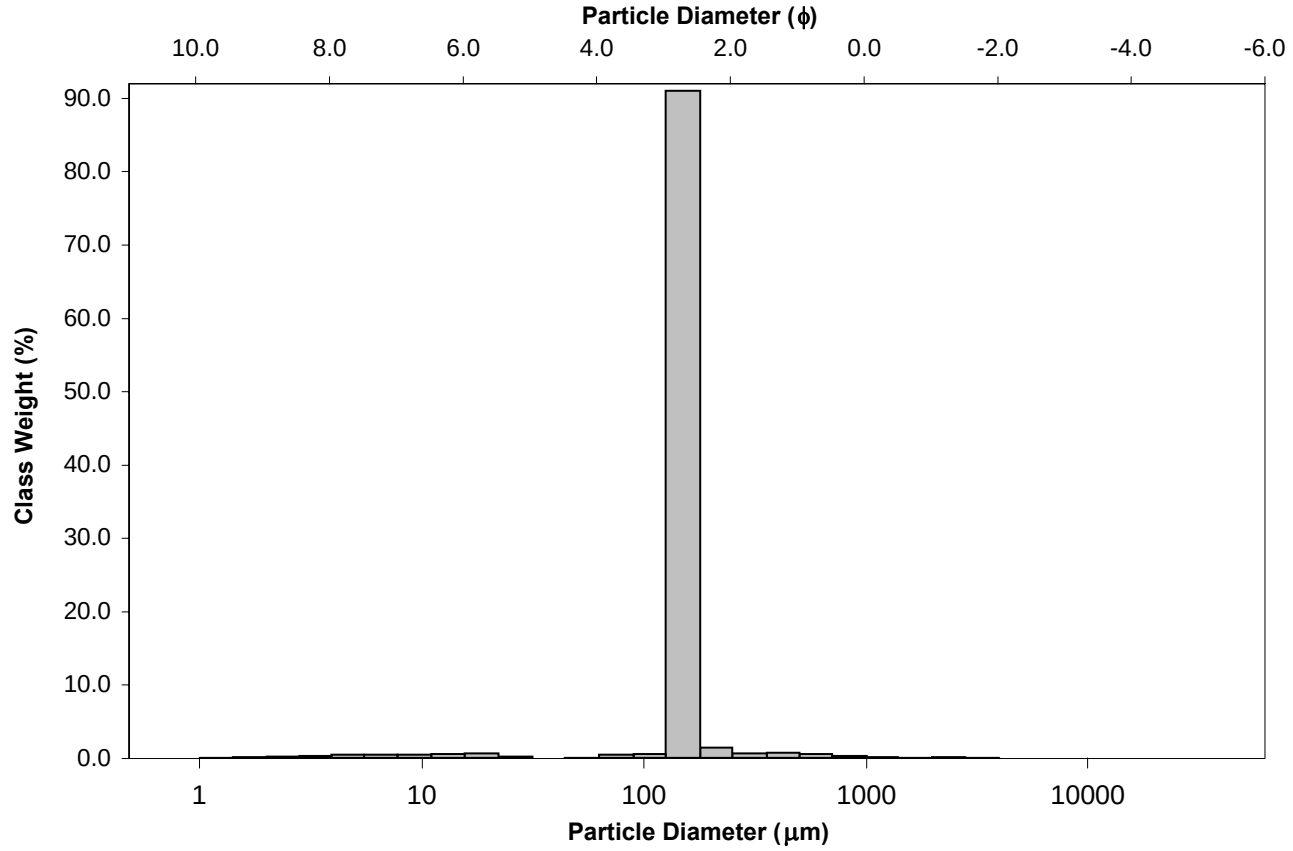
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	127.8	2.510
MEDIAN or D_{50}:	149.8	2.739
D_{90}:	175.5	2.968
(D_{90} / D_{10}):	1.374	1.182
(D_{90} - D_{10}):	47.74	0.458
(D_{75} / D_{25}):	1.219	1.110
(D_{75} - D_{25}):	29.76	0.286

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.8%
SAND:	96.4%	MEDIUM SAND:	1.4%
MUD:	3.4%	FINE SAND:	93.2%
		V FINE SAND:	1.0%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.9%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	1.1%
FINE GRAVEL:	0.0%	FINE SILT:	0.9%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.5%
V COARSE SAND:	0.1%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	159.6	140.0	2.836	149.8	2.739	Fine Sand
SORTING (σ):	116.8	1.799	0.847	1.129	0.175	Very Well Sorted
SKEWNESS (Sk):	16.08	-4.083	4.083	0.000	0.000	Symmetrical
KURTOSIS (K):	356.0	27.33	27.33	0.738	0.738	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_103**

ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

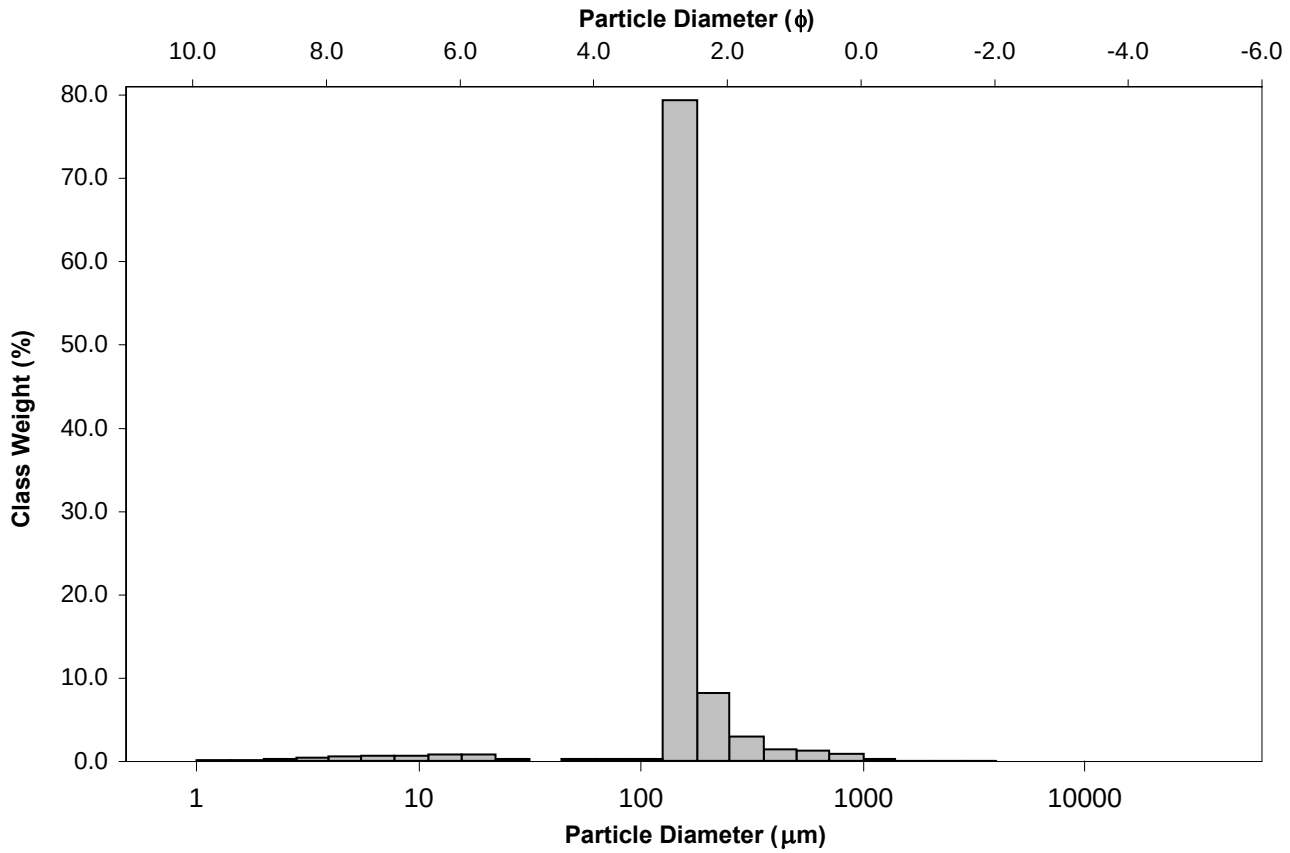
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	127.7	2.221
MEDIAN or D_{50}:	153.0	2.709
D_{90}:	214.5	2.970
(D_{90} / D_{10}):	1.680	1.337
(D_{90} - D_{10}):	86.85	0.749
(D_{75} / D_{25}):	1.254	1.128
(D_{75} - D_{25}):	34.64	0.326

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	2.0%
SAND:	95.1%	MEDIUM SAND:	4.2%
MUD:	4.8%	FINE SAND:	88.1%
		V FINE SAND:	0.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	0.0%	COARSE SILT:	1.0%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	1.5%
FINE GRAVEL:	0.0%	FINE SILT:	1.2%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.6%
V COARSE SAND:	0.3%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	174.3	143.7	2.799	153.0	2.709	Fine Sand
SORTING (σ):	133.4	2.082	1.058	1.314	0.393	Well Sorted
SKEWNESS (Sk):	9.412	-3.226	3.226	0.026	-0.026	Symmetrical
KURTOSIS (K):	159.5	18.77	18.77	2.345	2.345	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_106** ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Moderately Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Fine Sand

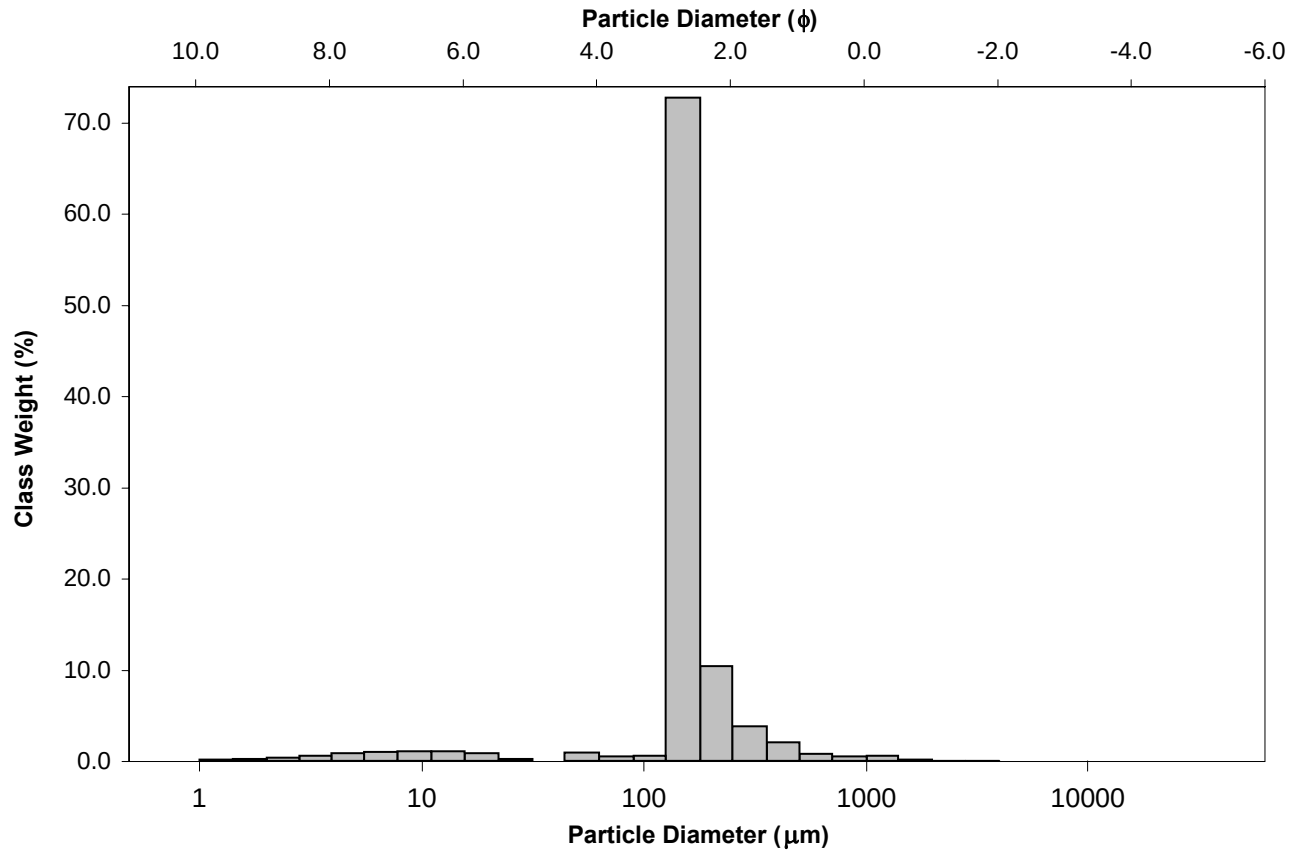
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	125.9	2.115
MEDIAN or D_{50}:	153.3	2.706
D_{90}:	230.9	2.989
(D_{90} / D_{10}):	1.834	1.414
(D_{90} - D_{10}):	105.0	0.875
(D_{75} / D_{25}):	1.278	1.140
(D_{75} - D_{25}):	37.72	0.354

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.0%	COARSE SAND:	1.2%
SAND:	92.6%	MEDIUM SAND:	5.6%
MUD:	7.4%	FINE SAND:	83.8%
		V FINE SAND:	1.1%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.9%
COARSE GRAVEL:	0.0%	COARSE SILT:	1.0%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	2.1%
FINE GRAVEL:	0.0%	FINE SILT:	1.8%
V FINE GRAVEL:	0.0%	V FINE SILT:	1.0%
V COARSE SAND:	0.8%	CLAY:	0.6%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	175.9	135.7	2.882	155.2	2.688	Fine Sand
SORTING (σ):	149.6	2.429	1.280	1.773	0.826	Moderately Sorted
SKEWNESS (Sk):	7.700	-2.794	2.794	-0.215	0.215	Fine Skewed
KURTOSIS (K):	98.25	13.39	13.39	5.289	5.289	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_107**

ANALYST & DATE: corrine.abel, 12/6/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

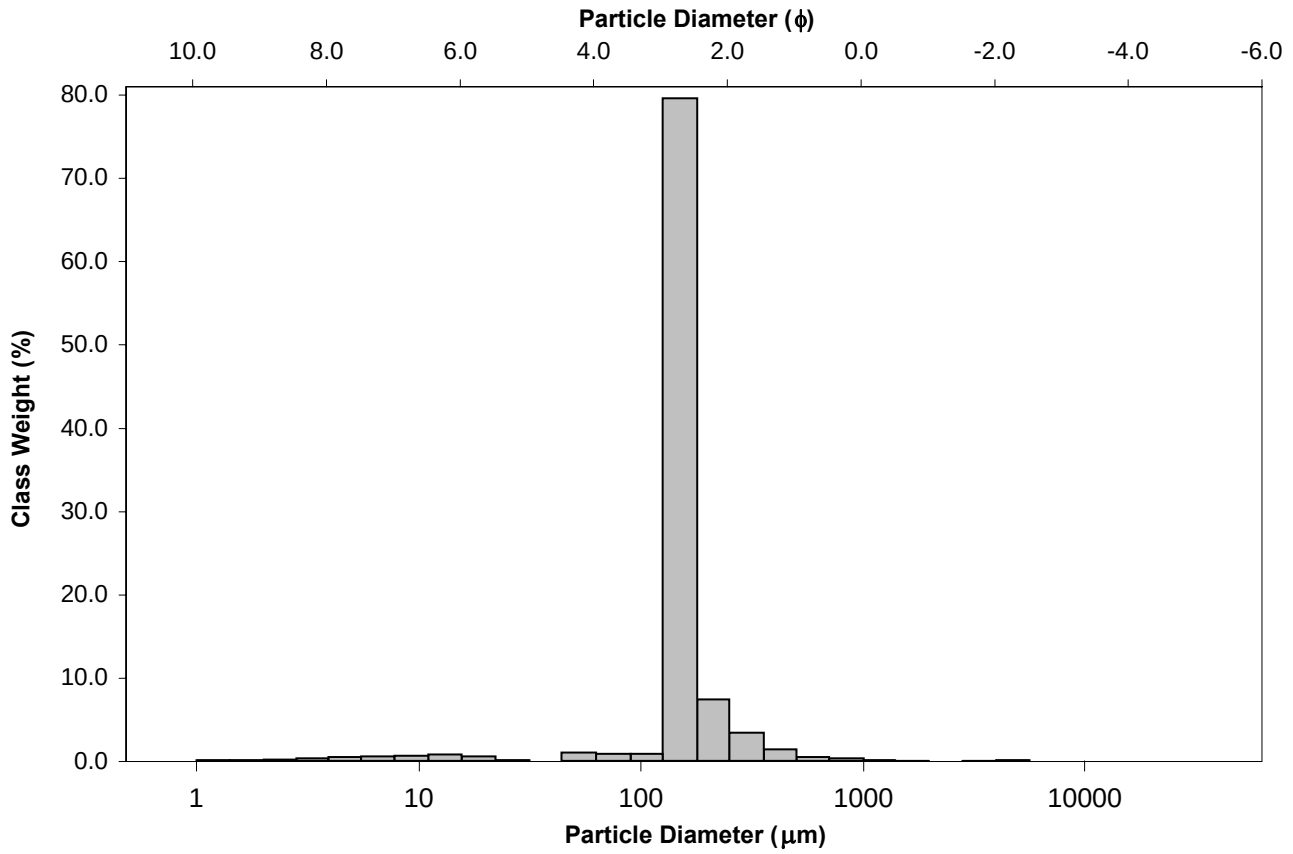
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	127.0	2.298
MEDIAN or D_{50}:	152.0	2.718
D_{90}:	203.3	2.978
(D_{90} / D_{10}):	1.602	1.296
(D_{90} - D_{10}):	76.37	0.679
(D_{75} / D_{25}):	1.253	1.127
(D_{75} - D_{25}):	34.32	0.325

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.1%	COARSE SAND:	0.8%
SAND:	95.0%	MEDIUM SAND:	4.7%
MUD:	4.9%	FINE SAND:	87.7%
		V FINE SAND:	1.6%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	1.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	1.4%
FINE GRAVEL:	0.1%	FINE SILT:	1.0%
V FINE GRAVEL:	0.0%	V FINE SILT:	0.6%
V COARSE SAND:	0.1%	CLAY:	0.3%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	168.3	141.3	2.823	152.0	2.718	Fine Sand
SORTING (σ):	161.5	1.993	0.995	1.340	0.422	Well Sorted
SKEWNESS (Sk):	20.24	-3.541	3.541	-0.098	0.098	Symmetrical
KURTOSIS (K):	535.2	21.59	21.59	2.596	2.596	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_109**

ANALYST & DATE: corrine.abel, 12/7/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

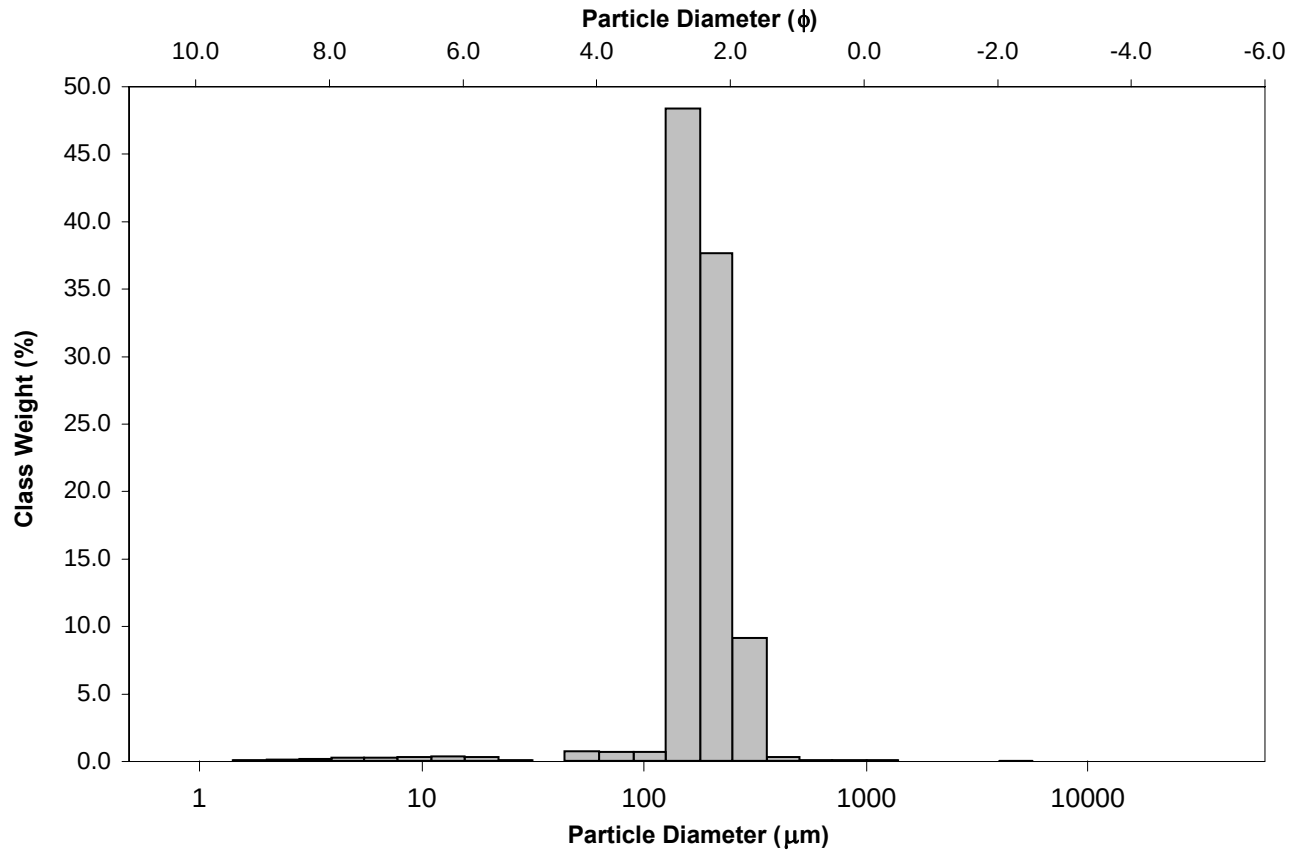
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.6	2.003
MEDIAN or D_{50}:	174.0	2.522
D_{90}:	249.4	2.937
(D_{90} / D_{10}):	1.910	1.466
(D_{90} - D_{10}):	118.8	0.934
(D_{75} / D_{25}):	1.493	1.262
(D_{75} - D_{25}):	71.72	0.578

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.0%	COARSE SAND:	0.2%
SAND:	97.4%	MEDIUM SAND:	9.5%
MUD:	2.6%	FINE SAND:	86.3%
		V FINE SAND:	1.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.7%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.3%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.7%
FINE GRAVEL:	0.0%	FINE SILT:	0.5%
V FINE GRAVEL:	0.0%	V FINE SILT:	0.3%
V COARSE SAND:	0.1%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	188.1	169.8	2.558	177.6	2.494	Fine Sand
SORTING (σ):	102.2	1.684	0.752	1.308	0.387	Well Sorted
SKEWNESS (Sk):	27.60	-4.383	4.383	0.182	-0.182	Coarse Skewed
KURTOSIS (K):	1212.7	32.21	32.21	0.886	0.886	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_111**

ANALYST & DATE: corrine.abel, 12/7/2012

SAMPLE TYPE: Unimodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Medium Gravelly Fine Sand

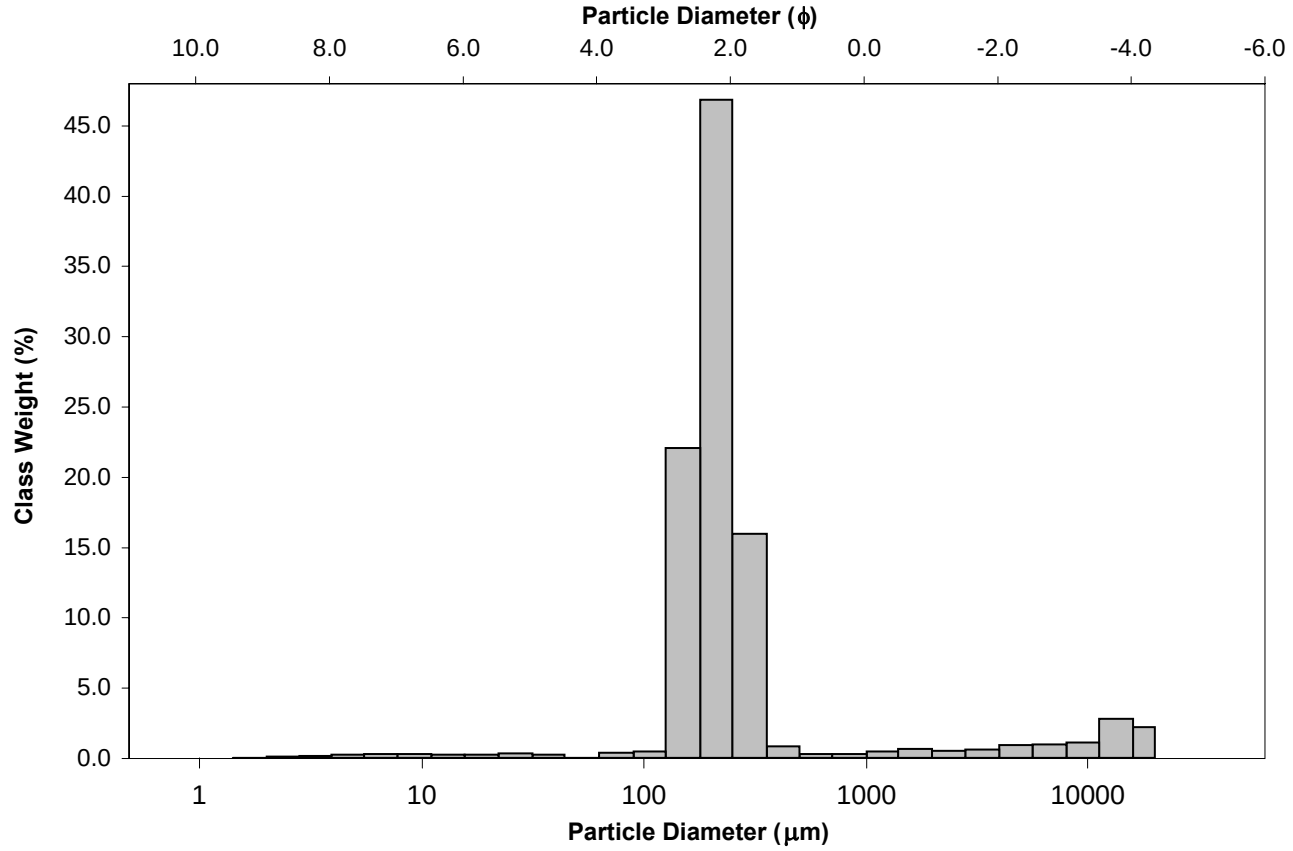
	μm	ϕ
MODE 1:	215.0	2.237
MODE 2:		
MODE 3:		
D_{10}:	138.8	0.554
MEDIAN or D_{50}:	212.7	2.233
D_{90}:	681.2	2.849
(D_{90} / D_{10}):	4.907	5.143
(D_{90} - D_{10}):	542.4	2.295
(D_{75} / D_{25}):	1.514	1.312
(D_{75} - D_{25}):	89.75	0.598

GRAIN SIZE DISTRIBUTION

GRAVEL:	8.6%	COARSE SAND:	0.6%
SAND:	89.1%	MEDIUM SAND:	17.4%
MUD:	2.3%	FINE SAND:	69.2%
		V FINE SAND:	0.9%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.3%
COARSE GRAVEL:	1.5%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	4.0%	MEDIUM SILT:	0.6%
FINE GRAVEL:	1.9%	FINE SILT:	0.6%
V FINE GRAVEL:	1.1%	V FINE SILT:	0.3%
V COARSE SAND:	1.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	1123.2	273.2	1.872	218.0	2.197	Fine Sand
SORTING (σ):	3279.3	3.407	1.768	2.303	1.204	Poorly Sorted
SKEWNESS (Sk):	3.840	1.643	-1.643	0.432	-0.432	Very Coarse Skewed
KURTOSIS (K):	16.97	8.278	8.278	4.232	4.232	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_112**

ANALYST & DATE: corrine.abel, 12/7/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

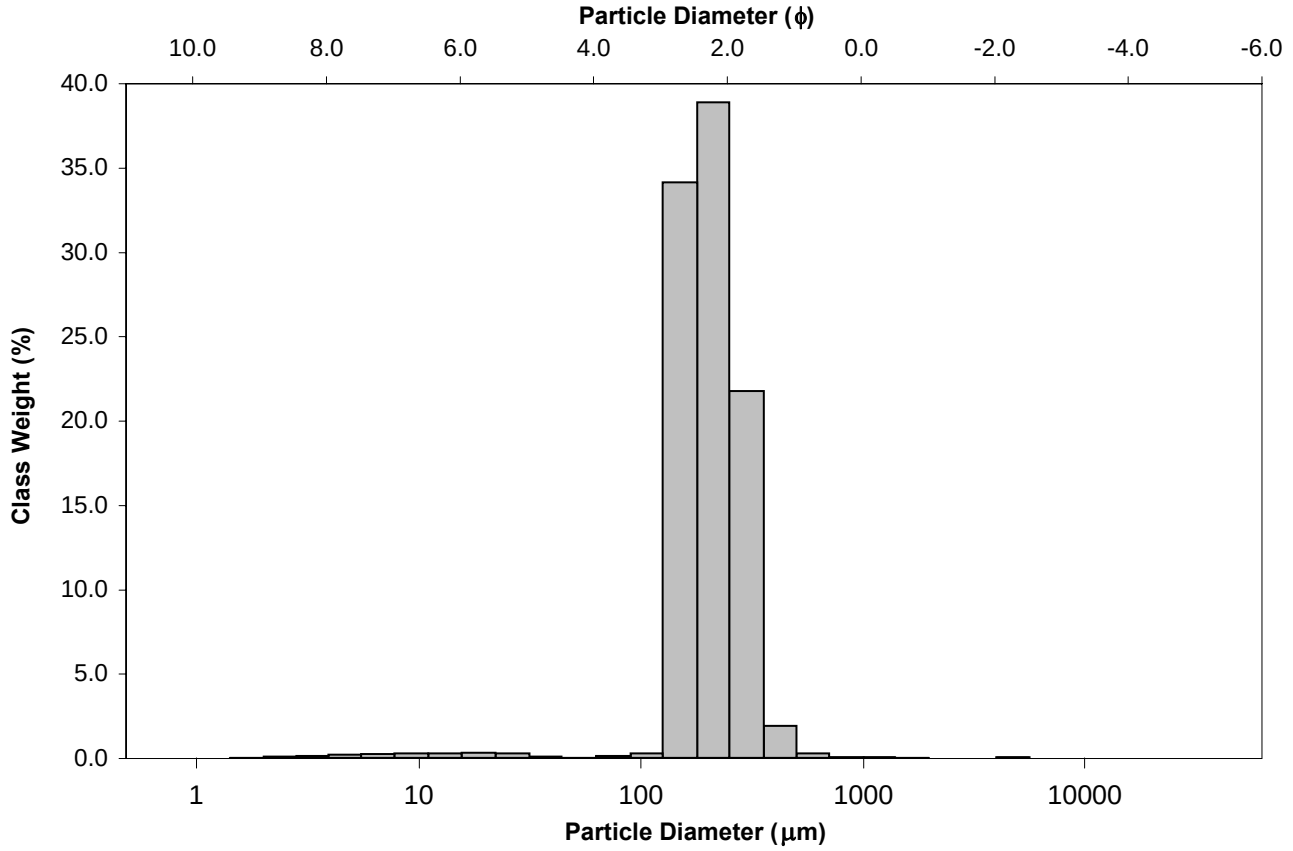
	μm	ϕ
MODE 1:	215.0	2.237
MODE 2:		
MODE 3:		
D_{10}:	134.9	1.670
MEDIAN or D_{50}:	199.3	2.327
D_{90}:	314.4	2.890
(D_{90} / D_{10}):	2.330	1.731
(D_{90} - D_{10}):	179.5	1.220
(D_{75} / D_{25}):	1.584	1.331
(D_{75} - D_{25}):	91.73	0.664

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.0%	COARSE SAND:	0.4%
SAND:	97.9%	MEDIUM SAND:	24.0%
MUD:	2.0%	FINE SAND:	73.1%
		V FINE SAND:	0.4%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.1%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.6%
FINE GRAVEL:	0.0%	FINE SILT:	0.5%
V FINE GRAVEL:	0.0%	V FINE SILT:	0.2%
V COARSE SAND:	0.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	215.3	192.9	2.374	201.3	2.312	Fine Sand
SORTING (σ):	119.0	1.692	0.759	1.378	0.462	Well Sorted
SKEWNESS (Sk):	21.48	-3.848	3.848	0.071	-0.071	Symmetrical
KURTOSIS (K):	795.2	28.19	28.19	0.869	0.869	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_113**

ANALYST & DATE: corrine.abel, 12/7/2012

SAMPLE TYPE: Unimodal, Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

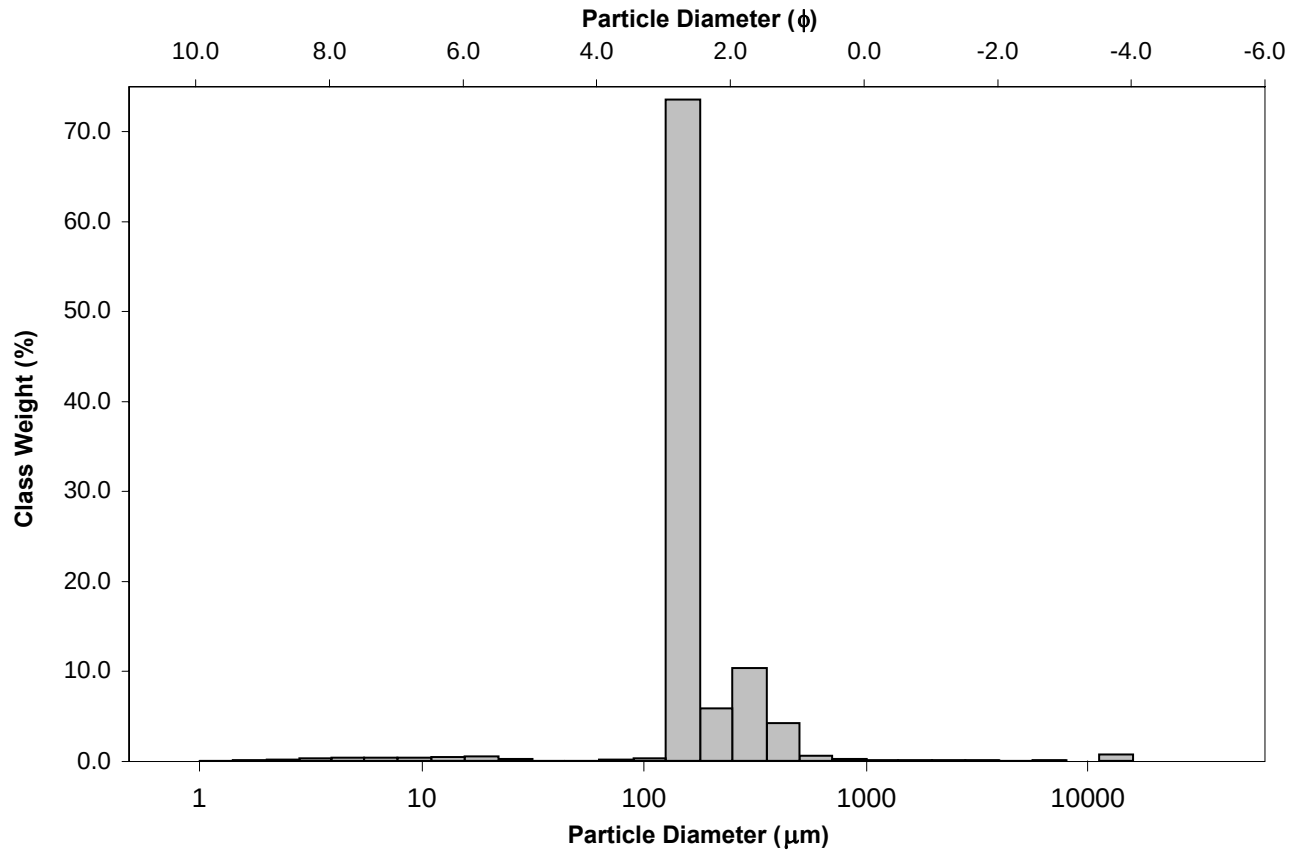
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	129.0	1.693
MEDIAN or D_{50}:	156.8	2.673
D_{90}:	309.2	2.954
(D_{90} / D_{10}):	2.396	1.745
(D_{90} - D_{10}):	180.2	1.261
(D_{75} / D_{25}):	1.275	1.141
(D_{75} - D_{25}):	38.23	0.351

GRAIN SIZE DISTRIBUTION

GRAVEL:	1.0%	COARSE SAND:	0.9%
SAND:	96.0%	MEDIUM SAND:	14.2%
MUD:	3.0%	FINE SAND:	80.4%
		V FINE SAND:	0.5%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.7%	MEDIUM SILT:	0.8%
FINE GRAVEL:	0.1%	FINE SILT:	0.8%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.5%
V COARSE SAND:	0.1%	CLAY:	0.1%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	290.2	165.3	2.597	173.7	2.525	Fine Sand
SORTING (σ):	1153.8	2.108	1.076	1.390	0.475	Well Sorted
SKEWNESS (Sk):	11.11	-0.488	0.488	0.545	-0.545	Very Coarse Skewed
KURTOSIS (K):	127.1	21.16	21.16	1.887	1.887	Very Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_114**

ANALYST & DATE: corrine.abel, 12/7/2012

SAMPLE TYPE: Unimodal, Very Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

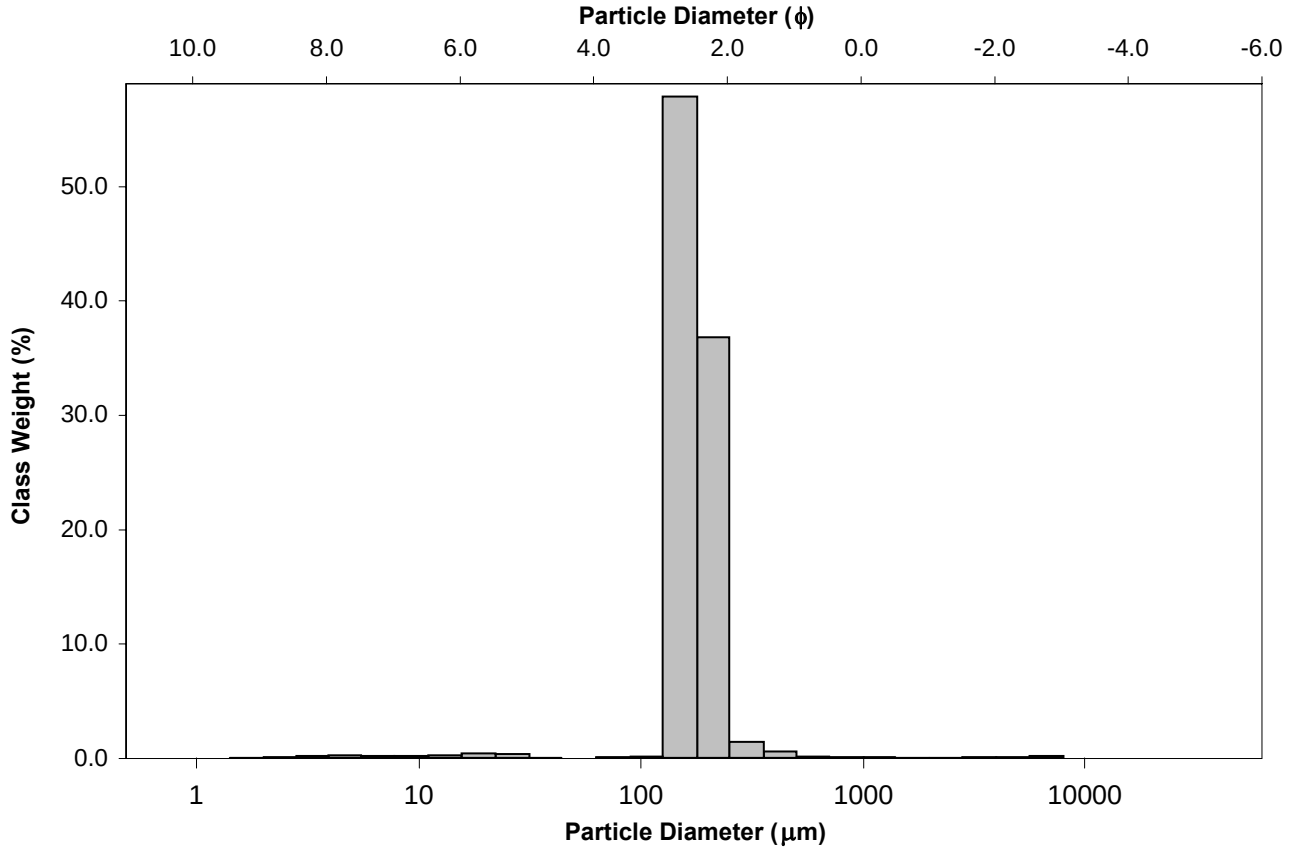
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.0	2.100
MEDIAN or D_{50}:	166.7	2.585
D_{90}:	233.3	2.933
(D_{90} / D_{10}):	1.781	1.397
(D_{90} - D_{10}):	102.3	0.833
(D_{75} / D_{25}):	1.411	1.215
(D_{75} - D_{25}):	58.93	0.497

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.4%	COARSE SAND:	0.3%
SAND:	97.6%	MEDIUM SAND:	2.0%
MUD:	2.1%	FINE SAND:	95.0%
		V FINE SAND:	0.2%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.0%	MEDIUM SILT:	0.5%
FINE GRAVEL:	0.3%	FINE SILT:	0.5%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.3%
V COARSE SAND:	0.1%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	196.9	165.4	2.596	170.9	2.549	Fine Sand
SORTING (σ):	338.3	1.670	0.740	1.246	0.318	Very Well Sorted
SKEWNESS (Sk):	17.03	-2.727	2.727	0.161	-0.161	Coarse Skewed
KURTOSIS (K):	311.2	35.13	35.13	0.780	0.780	Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_115**

ANALYST & DATE: corrine.abel, 12/7/2012

SAMPLE TYPE: Trimodal, Very Poorly Sorted

TEXTURAL GROUP: Sandy Gravel

SEDIMENT NAME: Sandy Coarse Gravel

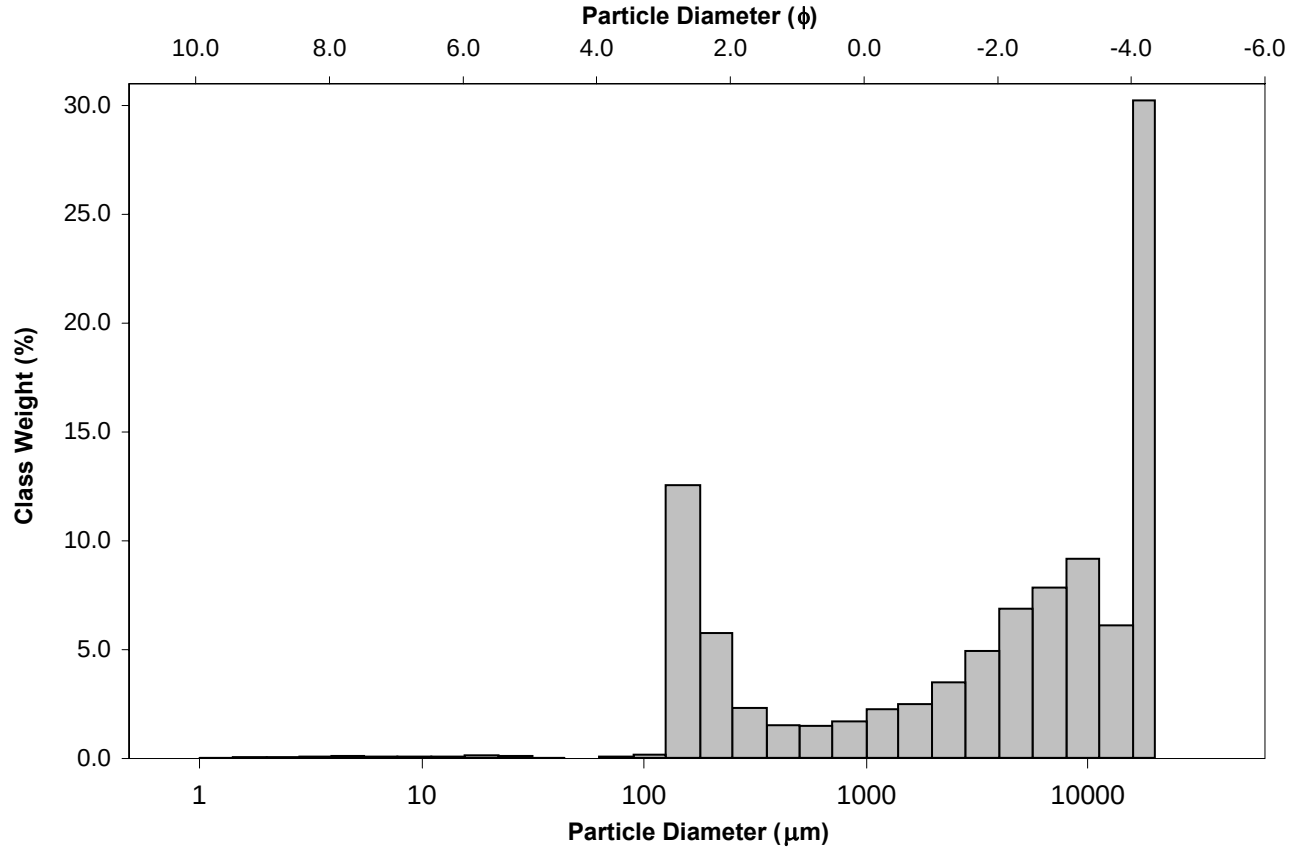
	μm	ϕ
MODE 1:	18000.0	-4.161
MODE 2:	152.5	2.737
MODE 3:	9600.0	-3.243
D_{10}:	155.5	-4.174
MEDIAN or D_{50}:	5079.6	-2.345
D_{90}:	18055.8	2.685
(D_{90} / D_{10}):	116.1	-0.643
(D_{90} - D_{10}):	17900.2	6.859
(D_{75} / D_{25}):	35.80	-0.370
(D_{75} - D_{25}):	13237.5	5.162

GRAIN SIZE DISTRIBUTION

GRAVEL:	64.8%	COARSE SAND:	3.6%
SAND:	34.4%	MEDIUM SAND:	4.3%
MUD:	0.8%	FINE SAND:	20.9%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	21.8%	COARSE SILT:	0.3%
MEDIUM GRAVEL:	17.0%	MEDIUM SILT:	0.2%
FINE GRAVEL:	16.5%	FINE SILT:	0.2%
V FINE GRAVEL:	9.5%	V FINE SILT:	0.1%
V COARSE SAND:	5.3%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	7252.1	2619.7	-1.389	2497.9	-1.321	Very Fine Gravel
SORTING (σ):	6870.8	6.386	2.675	6.570	2.716	Very Poorly Sorted
SKEWNESS (Sk):	0.520	-0.711	0.711	-0.467	0.467	Very Fine Skewed
KURTOSIS (K):	1.725	2.335	2.335	0.565	0.565	Very Platykurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_116**

ANALYST & DATE: corrine.abel, 12/7/2012

SAMPLE TYPE: Unimodal, Very Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Fine Gravelly Fine Sand

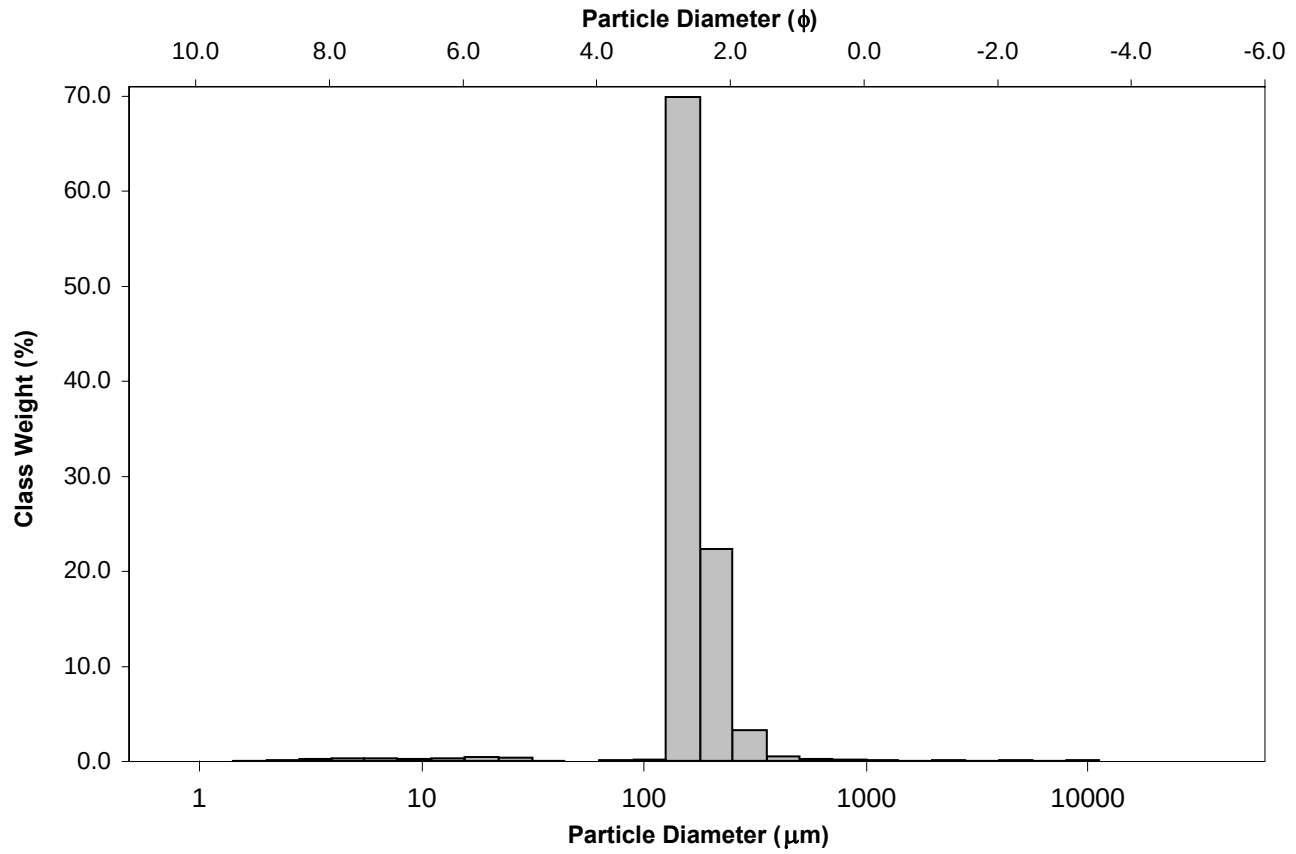
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	129.7	2.123
MEDIAN or D_{50}:	158.9	2.654
D_{90}:	229.6	2.946
(D_{90} / D_{10}):	1.769	1.388
(D_{90} - D_{10}):	99.83	0.823
(D_{75} / D_{25}):	1.293	1.150
(D_{75} - D_{25}):	40.97	0.370

GRAIN SIZE DISTRIBUTION

GRAVEL:	0.4%	COARSE SAND:	0.4%
SAND:	97.3%	MEDIUM SAND:	3.7%
MUD:	2.4%	FINE SAND:	92.7%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.8%
MEDIUM GRAVEL:	0.1%	MEDIUM SILT:	0.6%
FINE GRAVEL:	0.2%	FINE SILT:	0.6%
V FINE GRAVEL:	0.1%	V FINE SILT:	0.3%
V COARSE SAND:	0.2%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	192.2	158.4	2.658	164.3	2.606	Fine Sand
SORTING (σ):	374.6	1.725	0.786	1.238	0.308	Very Well Sorted
SKEWNESS (Sk):	19.82	-2.716	2.716	0.276	-0.276	Coarse Skewed
KURTOSIS (K):	441.6	31.94	31.94	1.078	1.078	Mesokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_118**

ANALYST & DATE: corrine.abel, 12/7/2012

SAMPLE TYPE: Unimodal, Poorly Sorted

TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Medium Gravelly Fine Sand

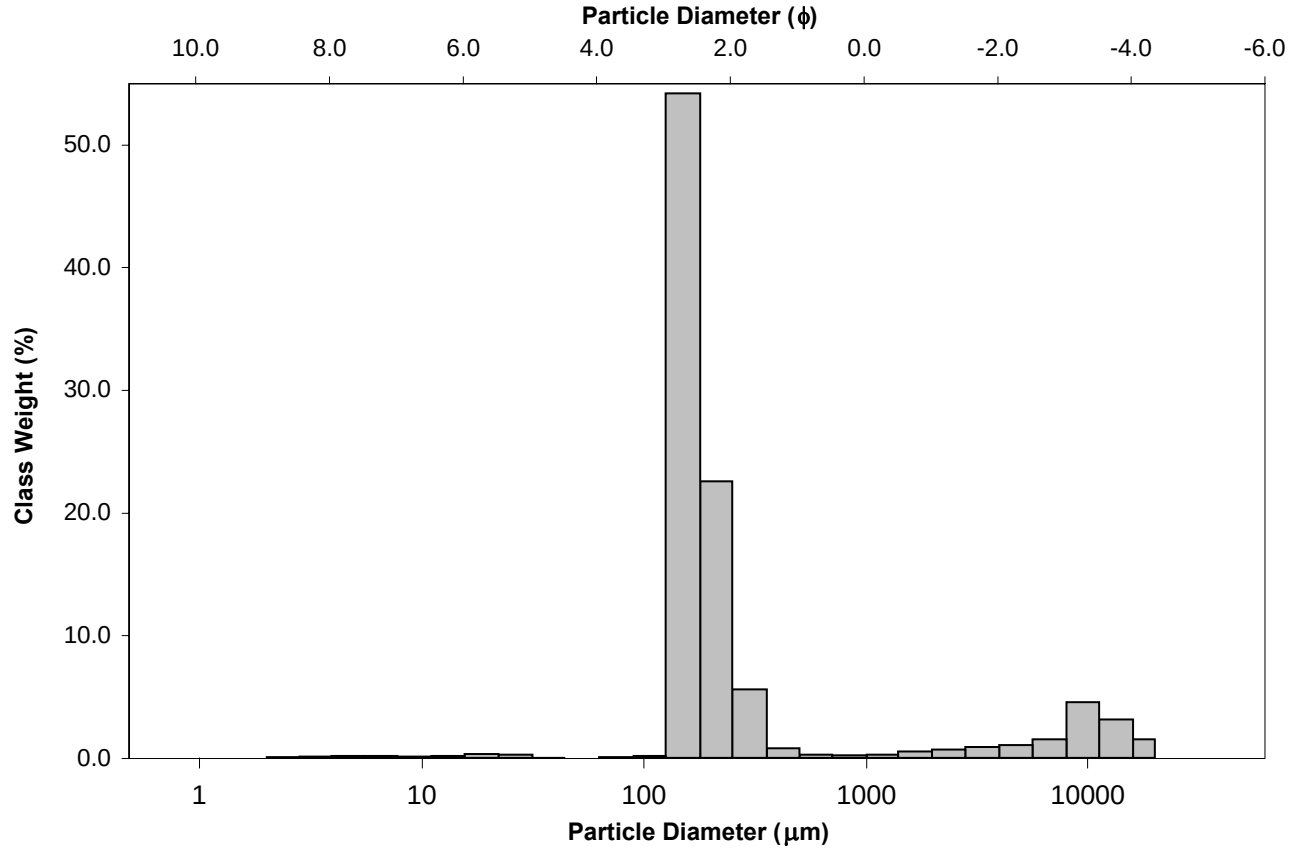
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	131.8	-2.523
MEDIAN or D_{50}:	170.6	2.552
D_{90}:	5747.8	2.923
(D_{90} / D_{10}):	43.60	-1.159
(D_{90} - D_{10}):	5615.9	5.446
(D_{75} / D_{25}):	1.604	1.324
(D_{75} - D_{25}):	87.73	0.682

GRAIN SIZE DISTRIBUTION

GRAVEL:	12.7%	COARSE SAND:	0.5%
SAND:	85.8%	MEDIUM SAND:	6.4%
MUD:	1.5%	FINE SAND:	77.8%
		V FINE SAND:	0.3%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.0%
COARSE GRAVEL:	1.0%	COARSE SILT:	0.6%
MEDIUM GRAVEL:	7.6%	MEDIUM SILT:	0.3%
FINE GRAVEL:	2.6%	FINE SILT:	0.3%
V FINE GRAVEL:	1.6%	V FINE SILT:	0.2%
V COARSE SAND:	0.8%	CLAY:	0.0%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	1401.3	278.6	1.844	197.3	2.341	Fine Sand
SORTING (σ):	3504.5	4.038	2.014	2.429	1.280	Poorly Sorted
SKEWNESS (Sk):	2.967	1.740	-1.740	0.684	-0.684	Very Coarse Skewed
KURTOSIS (K):	10.97	5.795	5.795	3.825	3.825	Extremely Leptokurtic

GRAIN SIZE DISTRIBUTION



SAMPLE STATISTICS

SAMPLE IDENTITY: **TCC_GRAB_120**

ANALYST & DATE: corrine.abel, 12/7/2012

SAMPLE TYPE: Unimodal, Very Well Sorted

TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Medium Gravelly Fine Sand

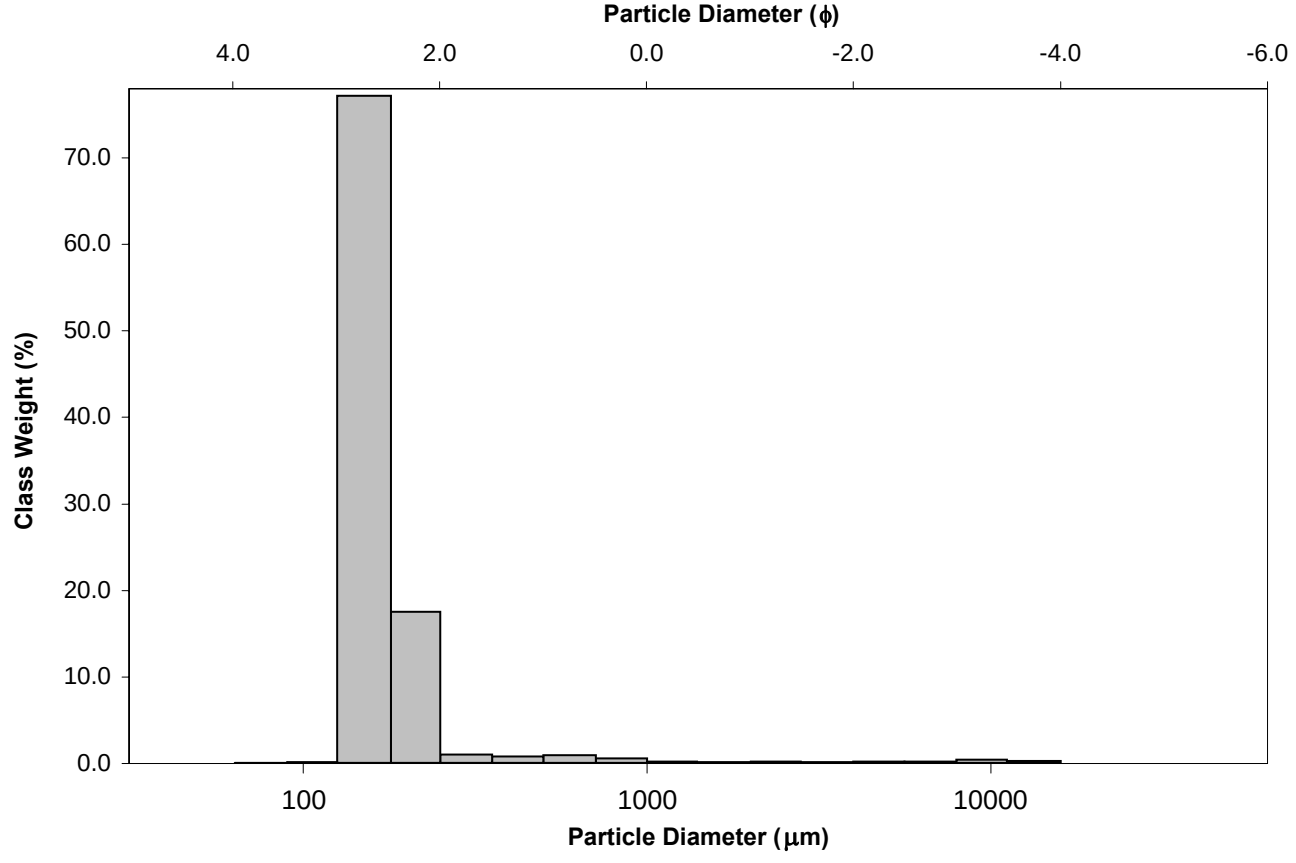
	μm	ϕ
MODE 1:	152.5	2.737
MODE 2:		
MODE 3:		
D_{10}:	130.0	2.163
MEDIAN or D_{50}:	156.8	2.673
D_{90}:	223.3	2.943
(D_{90} / D_{10}):	1.718	1.361
(D_{90} - D_{10}):	93.28	0.780
(D_{75} / D_{25}):	1.264	1.135
(D_{75} - D_{25}):	36.76	0.338

GRAIN SIZE DISTRIBUTION

GRAVEL:	1.3%	COARSE SAND:	1.4%
SAND:	97.3%	MEDIUM SAND:	1.6%
MUD:	1.4%	FINE SAND:	93.9%
		V FINE SAND:	0.2%
V COARSE GRAVEL:	0.0%	V COARSE SILT:	0.2%
COARSE GRAVEL:	0.0%	COARSE SILT:	0.2%
MEDIUM GRAVEL:	0.7%	MEDIUM SILT:	0.2%
FINE GRAVEL:	0.3%	FINE SILT:	0.2%
V FINE GRAVEL:	0.3%	V FINE SILT:	0.2%
V COARSE SAND:	0.3%	CLAY:	0.2%

	METHOD OF MOMENTS			FOLK & WARD METHOD		
	Arithmetic	Geometric	Logarithmic	Geometric	Logarithmic	Description
	μm	μm	ϕ	μm	ϕ	
MEAN ($\bar{x}$):	275.6	165.9	2.591	160.5	2.639	Fine Sand
SORTING (σ):	989.1	1.856	0.893	1.219	0.286	Very Well Sorted
SKEWNESS (Sk):	10.77	1.563	-1.563	0.276	-0.276	Coarse Skewed
KURTOSIS (K):	126.3	28.36	28.36	1.169	1.169	Leptokurtic

GRAIN SIZE DISTRIBUTION



APPENDIX D – CONTAMINANT ANALYSIS

Tranche B

Teesside Cable Corridor

APPENDIX D – CONTAMINANT ANALYSIS

Tranche B

Table D.1 **Hydrocarbons Results and Comparison to the ERL and ERM - Long *et al.*, 1995.**

Unless specified, concentrations in µg/kg	TB - CHEM - 1	TB - CHEM - 4	TB - CHEM - 6	TB - CHEM - 10	TB - CHEM - 13	TB - CHEM - 17	TB - CHEM - 19	TB - CHEM - 25	TB - CHEM - 33	TB - CHEM - 36	TB - CHEM - 40	*Effect Range Low (ERL)*	*Effect Range Median (ERM)*
Benzo(b)anthracene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Benzo(e)pyrene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Benzo(j)fluoranthene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C1 Chrysene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C1 Dibenzothiophene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C1 Fluoanthene : Dry Wt	<10	<10	<10	<10	<10	12.9	<10	<10	<10	<10	<10		
C1 Fluorene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C1 Naphthalene : Dry Wt	63	<10	<10	74.6	19.2	38.1	<10	<10	<10	<10	<10		
C1 Phenanthrene : Dry Wt	<10	<10	<10	<10	<10	22.2	<10	<10	<10	<10	<10		
C2 Chrysene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C2 Dibenzothiophene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C2 Fluorene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C2 Naphthalene : Dry Wt	66.5	<10	<10	81	<10	53.8	<10	<10	<10	<10	<10		
C2 Phenanthrene : Dry Wt	<10	<10	<10	<10	<10	29.4	<10	<10	<10	<10	<10		
C3 Chrysene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C3 Dibenzothiophene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C3 Fluorene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C3 Naphthalene : Dry Wt	61.2	<10	<10	97.4	<10	104	<10	<10	<10	<10	<10		
C3 Phenanthrene : Dry Wt	<10	<10	<10	<10	<10	24.9	<10	<10	<10	<10	<10		
C4 Chrysene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C4 Naphthalene : Dry Wt	14.2	<10	<10	24	<10	44.4	<10	<10	<10	<10	<10		
C4 Phenanthrene : Dry Wt	<10	<10	<10	<10	<10	20.3	<10	<10	<10	<10	<10		
Dibenzothiophene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Perylene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Acenaphthene : Dry Wt	<2	<2	<2	2.2	<2	2.35	<2	<2	<2	<2	<2	16	500
Acenaphthylene : Dry Wt	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	44	640
Anthracene : Dry Wt	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	85.3	1100
Benzo(a)anthracene : Dry Wt	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	261	1600
Benzo(a)pyrene : Dry Wt	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	430	1600
Benzo(b)fluoranthene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Benzo(ghi)perylene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Benzo(k)fluoranthene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Chrysene + Triphenylene : Dry Wt	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		
Dibenzo(ah)anthracene : Dry Wt	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	63.4	260
Fluoranthene : Dry Wt	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	600	5100
Fluorene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	19	540
Indeno(1,2,3-c,d)pyrene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Naphthalene : Dry Wt	61.5	<30	<30	69.6	<30	41	<30	<30	<30	<30	<30	160	2100
Phenanthrene : Dry Wt	<10	<10	<10	<10	<10	10.5	<10	<10	<10	<10	<10	240	1500
Pyrene : Dry Wt	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	665	2600
PAH : Total : Dry Wt : mg/kg	<0.132	<0.100	<0.100	<0.140	<0.100	<0.112	<0.100	<0.100	<0.100	<0.100	<0.100		
Total Hydrocarbons: Dry Wt: mg/kg	0.12	0.25	0.38	0.13	0.22	0.48	0.93	0.5	0.53	0.79	0.1		

APPENDIX D – CONTAMINANT ANALYSIS

Tranche B

Table D.2 **Hydrocarbons Results and Comparison to the ISQG and PEL - CCME, 1999.**

Unless specified, concentrations in µg/kg	TB - CHEM - 1	TB - CHEM - 4	TB - CHEM - 6	TB - CHEM - 10	TB - CHEM - 13	TB - CHEM - 17	TB - CHEM - 19	TB - CHEM - 25	TB - CHEM - 33	TB - CHEM - 36	TB - CHEM - 40	*ISQG*	*PEL*
Benzo(b)anthracene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Benzo(e)pyrene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Benzo(j)fluoranthene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C1 Chrysene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C1 Dibenzothiophene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C1 Fluoanthene : Dry Wt	<10	<10	<10	<10	<10	12.9	<10	<10	<10	<10	<10		
C1 Fluorene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C1 Naphthalene : Dry Wt	63	<10	<10	74.6	19.2	38.1	<10	<10	<10	<10	<10		
C1 Phenanthrene : Dry Wt	<10	<10	<10	<10	<10	22.2	<10	<10	<10	<10	<10		
C2 Chrysene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C2 Dibenzothiophene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C2 Fluorene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C2 Naphthalene : Dry Wt	66.5	<10	<10	81	<10	53.8	<10	<10	<10	<10	<10		
C2 Phenanthrene : Dry Wt	<10	<10	<10	<10	<10	29.4	<10	<10	<10	<10	<10		
C3 Chrysene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C3 Dibenzothiophene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C3 Fluorene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C3 Naphthalene : Dry Wt	61.2	<10	<10	97.4	<10	104	<10	<10	<10	<10	<10		
C3 Phenanthrene : Dry Wt	<10	<10	<10	<10	<10	24.9	<10	<10	<10	<10	<10		
C4 Chrysene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C4 Naphthalene : Dry Wt	14.2	<10	<10	24	<10	44.4	<10	<10	<10	<10	<10		
C4 Phenanthrene : Dry Wt	<10	<10	<10	<10	<10	20.3	<10	<10	<10	<10	<10		
Dibenzothiophene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Perylene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Acenaphthene : Dry Wt	<2	<2	<2	2.2	<2	2.35	<2	<2	<2	<2	<2	6.71	88.9
Acenaphthylene : Dry Wt	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	5.87	128
Anthracene : Dry Wt	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	46.9	245
Benzo(a)anthracene : Dry Wt	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
Benzo(a)pyrene : Dry Wt	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	88.8	763
Benzo(b)fluoranthene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Benzo(ghi)perylene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Benzo(k)fluoranthene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Chrysene + Triphenylene : Dry Wt	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		
Dibenzo(ah)anthracene : Dry Wt	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	6.22	135
Fluoranthene : Dry Wt	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	113	1494
Fluorene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.2	144
Indeno(1,2,3-c,d)pyrene : Dry Wt	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Naphthalene : Dry Wt	61.5	<30	<30	69.6	<30	41	<30	<30	<30	<30	<30	34.6	391
Phenanthrene : Dry Wt	<10	<10	<10	<10	<10	10.5	<10	<10	<10	<10	<10	86.7	544
Pyrene : Dry Wt	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	153	1398
PAH : Total : Dry Wt : mg/kg	<0.132	<0.100	<0.100	<0.140	<0.100	<0.112	<0.100	<0.100	<0.100	<0.100	<0.100		
Total Hydrocarbons: Dry Wt: mg/kg	0.12	0.25	0.38	0.13	0.22	0.48	0.93	0.5	0.53	0.79	0.1		

APPENDIX D – CONTAMINANT ANALYSIS

Tranche B

Table D.3 **Metals, Metalloids and Non-Metals Results and Comparison to the ERL and ERM - Long *et al.*, 1995.**

Unless specified, concentrations in mg/kg	TB - CHEM - 1	TB - CHEM - 4	TB - CHEM - 6	TB - CHEM - 10	TB - CHEM - 13	TB - CHEM - 17	TB - CHEM - 19	TB - CHEM - 25	TB - CHEM - 33	TB - CHEM - 36	TB - CHEM - 40	*Effect Range Low (ERL)*	*Effect Range Median (ERM)*
Aluminium, HF Digest : Dry Wt	16000	13600	12100	12900	12500	19200	16100	14700	14100	14800	12900		
Barium, HF Digest : Dry Wt	192	170	137	155	164	190	191	157	188	170	175		
Iron, HF Digest : Dry Wt	10500	10200	5040	7440	3780	18700	10500	5920	5350	9820	3680		
Arsenic, HF Digest : Dry Wt	2.65	2.5	2.59	2.7	2.28	5.31	2.3	2.79	3.04	2.22	2.57	8.2	70
Cadmium, HF Digest : Dry Wt	<0.03	<0.03	<0.03	<0.03	<0.03	0.071	<0.03	<0.03	<0.03	<0.03	<0.03	1.2	9.6
Chromium, HF Digest : Dry Wt	15.1	22.4	11.2	25	15.1	112	13.5	10	13.9	21.3	11	81	370
Copper, HF Digest : Dry Wt	4.24	6.06	3.73	5.18	3.15	160	4.47	4.13	2.64	3.27	2.74	34	270
Lead, HF Digest : Dry Wt	6.97	7.28	7.21	7.03	6.57	12.3	8.67	12.6	6.99	9.19	7.05	46.7	218
Lithium, HF Digest : Dry Wt	4.43	4.44	4.38	5.07	4.69	6.85	4.73	5.06	5.84	5.12	4.96		
Manganese, HF Digest : Dry Wt	197	455	175	244	138	665	432	164	103	324	119		
Mercury	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.15	0.71
Nickel, HF Digest : Dry Wt	2.79	7.44	3.21	7.84	2.85	52.4	2.37	4.57	5.82	3.72	3.63	20.9	51.6
Tin, HF Digest : Dry Wt	<0.5	0.54	0.53	<0.5	<0.5	1.24	0.78	<0.5	<0.5	<0.5	<0.5		
Vanadium, HF Digest : Dry Wt	8.8	14.8	11.4	10.5	7.98	30.6	15.4	15.5	11.1	11.5	8.4		
Zinc : HF Digest : Dry Wt	8.07	15.5	11.2	10.1	7.47	46.3	16	11.5	10.6	14.6	7.87	150	410
Boron, Boiling water soluble : Dry Wt	2.24	2.04	2.04	2.16	2.28	2.48	2.06	2.3	2.5	2.61	2.03		
Selenium : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		

Table D.4 **Metals, Metalloids and Non-Metals Results and Comparison to the AL1 and AL2 - CEFAS, 2003.**

Unless specified, concentrations in mg/kg	TB - CHEM - 1	TB - CHEM - 4	TB - CHEM - 6	TB - CHEM - 10	TB - CHEM - 13	TB - CHEM - 17	TB - CHEM - 19	TB - CHEM - 25	TB - CHEM - 33	TB - CHEM - 36	TB - CHEM - 40	*Action Level 1*	*Action Level 2*
Aluminium, HF Digest : Dry Wt	16000	13600	12100	12900	12500	19200	16100	14700	14100	14800	12900		
Barium, HF Digest : Dry Wt	192	170	137	155	164	190	191	157	188	170	175		
Iron, HF Digest : Dry Wt	10500	10200	5040	7440	3780	18700	10500	5920	5350	9820	3680		
Arsenic, HF Digest : Dry Wt	2.65	2.5	2.59	2.7	2.28	5.31	2.3	2.79	3.04	2.22	2.57	20	100
Cadmium, HF Digest : Dry Wt	<0.03	<0.03	<0.03	<0.03	<0.03	0.071	<0.03	<0.03	<0.03	<0.03	<0.03	0.4	5
Chromium, HF Digest : Dry Wt	15.1	22.4	11.2	25	15.1	112	13.5	10	13.9	21.3	11	40	400
Copper, HF Digest : Dry Wt	4.24	6.06	3.73	5.18	3.15	160	4.47	4.13	2.64	3.27	2.74	40	400
Lead, HF Digest : Dry Wt	6.97	7.28	7.21	7.03	6.57	12.3	8.67	12.6	6.99	9.19	7.05	50	500
Lithium, HF Digest : Dry Wt	4.43	4.44	4.38	5.07	4.69	6.85	4.73	5.06	5.84	5.12	4.96		
Manganese, HF Digest : Dry Wt	197	455	175	244	138	665	432	164	103	324	119		
Mercury	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.3	3
Nickel, HF Digest : Dry Wt	2.79	7.44	3.21	7.84	2.85	52.4	2.37	4.57	5.82	3.72	3.63	20	200
Tin, HF Digest : Dry Wt	<0.5	0.54	0.53	<0.5	<0.5	1.24	0.78	<0.5	<0.5	<0.5	<0.5		
Vanadium, HF Digest : Dry Wt	8.8	14.8	11.4	10.5	7.98	30.6	15.4	15.5	11.1	11.5	8.4		
Zinc : HF Digest : Dry Wt	8.07	15.5	11.2	10.1	7.47	46.3	16	11.5	10.6	14.6	7.87	130	800
Boron, Boiling water soluble : Dry Wt	2.24	2.04	2.04	2.16	2.28	2.48	2.06	2.3	2.5	2.61	2.03		
Selenium : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		

APPENDIX D – CONTAMINANT ANALYSIS

Tranche B

Table D.5 **Metals, Metalloids and Non-Metal Results and Comparison to the ISQG and PEL - CCME, 1999.**

Unless specified, concentrations in mg/kg	TB - CHEM - 1	TB - CHEM - 4	TB - CHEM - 6	TB - CHEM - 10	TB - CHEM - 13	TB - CHEM - 17	TB - CHEM - 19	TB - CHEM - 25	TB - CHEM - 33	TB - CHEM - 36	TB - CHEM - 40	ISQG	PEL
Aluminium, HF Digest : Dry Wt	16000	13600	12100	12900	12500	19200	16100	14700	14100	14800	12900		
Barium, HF Digest : Dry Wt	192	170	137	155	164	190	191	157	188	170	175		
Iron, HF Digest : Dry Wt	10500	10200	5040	7440	3780	18700	10500	5920	5350	9820	3680		
Arsenic, HF Digest : Dry Wt	2.65	2.5	2.59	2.7	2.28	5.31	2.3	2.79	3.04	2.22	2.57	7.24	41.6
Cadmium, HF Digest : Dry Wt	<0.03	<0.03	<0.03	<0.03	<0.03	0.071	<0.03	<0.03	<0.03	<0.03	<0.03	0.7	4.2
Chromium, HF Digest : Dry Wt	15.1	22.4	11.2	25	15.1	112	13.5	10	13.9	21.3	11	52.3	160
Copper, HF Digest : Dry Wt	4.24	6.06	3.73	5.18	3.15	160	4.47	4.13	2.64	3.27	2.74	18.7	108
Lead, HF Digest : Dry Wt	6.97	7.28	7.21	7.03	6.57	12.3	8.67	12.6	6.99	9.19	7.05	30.2	112
Lithium, HF Digest : Dry Wt	4.43	4.44	4.38	5.07	4.69	6.85	4.73	5.06	5.84	5.12	4.96		
Manganese, HF Digest : Dry Wt	197	455	175	244	138	665	432	164	103	324	119		
Mercury	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.13	0.7
Nickel, HF Digest : Dry Wt	2.79	7.44	3.21	7.84	2.85	52.4	2.37	4.57	5.82	3.72	3.63		
Tin, HF Digest : Dry Wt	<0.5	0.54	0.53	<0.5	<0.5	1.24	0.78	<0.5	<0.5	<0.5	<0.5		
Vanadium, HF Digest : Dry Wt	8.8	14.8	11.4	10.5	7.98	30.6	15.4	15.5	11.1	11.5	8.4		
Zinc : HF Digest : Dry Wt	8.07	15.5	11.2	10.1	7.47	46.3	16	11.5	10.6	14.6	7.87	124	271
Boron, Boiling water soluble : Dry Wt	2.24	2.04	2.04	2.16	2.28	2.48	2.06	2.3	2.5	2.61	2.03		
Selenium : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		

Table D.6 **PCB Results and Comparison to the AL1 and AL2 - CEFAS, 2003.**

Unless specified, concentrations in µg/kg	TB - CHEM - 1	TB - CHEM - 4	TB - CHEM - 6	TB - CHEM - 10	TB - CHEM - 13	TB - CHEM - 17	TB - CHEM - 19	TB - CHEM - 25	TB - CHEM - 33	TB - CHEM - 36	TB - CHEM - 40	Action Level 1	Action Level 2
PCB - 028 : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 052 : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 101 : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 118 : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 138 : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 153 : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 180 : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Sum	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	10	None

Table D.7 **Organotins Results**

Unless specified, concentrations in µg/kg	TB - CHEM - 1	TB - CHEM - 4	TB - CHEM - 6	TB - CHEM - 10	TB - CHEM - 13	TB - CHEM - 17	TB - CHEM - 19	TB - CHEM - 25	TB - CHEM - 33	TB - CHEM - 36	TB - CHEM - 40
Dibutyl Tin : Dry Wt as Cation	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Dioctyl Tin : Dry Wt as Cation	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Diphenyl Tin : Dry Wt as Cation	<3	<2	<3	<3	<3	<3	<2	<3	<3	<3	<3
Tetrabutyl Tin : Dry Wt as Cation	<3	<2	<3	<3	<3	<3	<2	<3	<3	<3	<3
Tributyl Tin : Dry Wt as Cation	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Triphenyl Tin : Dry Wt as Cation	<3	<2	<3	<3	<3	<3	<2	<3	<3	<3	<3

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Teesside Cable Corridor

Table D.8 **Hydrocarbons Results and Comparison to the ERL and ERM - Long*et al.*, 1995.**

Unless specified, concentrations in µg/kg	TCC - Chem - 1	TCC - Chem - 3	TCC - Chem - 5	TCC - Chem - 6	TCC - Chem - 9	TCC - Chem - 10	TCC - Chem - 12	TCC - Chem - 18	TCC - Chem - 27	TCC - Chem - 40	TCC - Chem - 48	TCC - Chem - 54	TCC - Chem - 61	TCC - Chem - 62	TCC - Chem - 64	TCC - Chem - 75	TCC - Chem - 86	TCC - Chem - 95	TCC - Chem - 102	TCC - Chem - 109	TCC - Chem - 114	*Effect Range Low (ERL)*	*Effect Range Median (ERM)*
Benzo(b)anthracene : Dry Wt	<10	<10	<10	<10	40.3	57.1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Benzo(e)pyrene : Dry Wt	<10	<10	<10	88.6	540	963	76	<10	<10	11.7	17.2	<10	17.3	19.7	30.2	30.3	<10	<10	<10	12.5	<10		
Benzo(j)fluoranthene : Dry Wt	<10	<10	<10	34.5	316	504	38.1	<10	<10	<10	<10	<10	<10	<10	10.5	15.6	<10	<10	<10	<10	<10		
C1 Chrysene : Dry Wt	<10	<10	<10	232	743	1140	120	<10	<10	<10	<10	<10	38	51.5	33.6	39.6	<10	<10	<10	<10	<10		
C1 Dibenzothiophene : Dry Wt	<10	<10	<10	115	392	565	40.3	<10	<10	<10	<10	<10	<10	16.5	<10	<10	<10	<10	<10	<10	<10		
C1 Fluoanthene : Dry Wt	32.9	23.3	36.8	477	1450	2270	255	30	17.4	17	32.3	<10	97.9	139	94.7	91.2	12.8	<10	<10	25	<10		
C1 Fluorene : Dry Wt	14.2	<10	<10	230	767	1020	69.1	<10	<10	<10	<10	<10	40.7	37	16.9	16.4	<10	<10	<10	<10	<10		
C1 Naphthalene : Dry Wt	151	51.7	77.5	1340	3660	4060	340	55.1	30.3	31.2	<10	<10	261	187	90	121	44.8	34.2	48.6	<10	<10		
C1 Phenanthrene : Dry Wt	50.6	27.5	50.6	816	2180	3020	315	28.1	17.5	21.2	31.6	<10	152	156	87.3	99.5	12.7	<10	16.8	16.8	<10		
C2 Chrysene : Dry Wt	<10	<10	<10	115	261	398	47.9	<10	<10	<10	<10	<10	<10	13.4	<10	12.4	<10	<10	<10	<10	<10		
C2 Dibenzothiophene : Dry Wt	28.9	<10	<10	175	439	309	69.3	<10	<10	<10	<10	<10	33.2	21.6	<10	26.5	<10	<10	<10	<10	<10		
C2 Fluorene : Dry Wt	15.8	<10	<10	340	1180	1510	124	<10	<10	<10	<10	<10	58.6	70.7	17.1	28	<10	<10	<10	<10	<10		
C2 Naphthalene : Dry Wt	181	59.4	107	1510	4020	4400	458	58.8	32.7	47.3	<10	<10	342	278	123	171	50.6	48.4	63.6	<10	<10		
C2 Phenanthrene : Dry Wt	73.1	37.5	66.2	913	1980	2910	358	38.8	17.4	23.6	34.5	<10	202	166	96.4	127	17.6	11.1	15.4	15.4	<10		
C3 Chrysene : Dry Wt	<10	<10	<10	100	249	514	38.6	<10	<10	<10	<10	<10	<10	<10	<10	11.8	<10	<10	<10	<10	<10		
C3 Dibenzothiophene : Dry Wt	15.5	<10	<10	112	269	503	50.7	<10	<10	<10	<10	<10	17	<10	<10	<10	<10	<10	<10	<10	<10		
C3 Fluorene : Dry Wt	23.5	<10	<10	393	1040	1420	96.1	<10	<10	<10	<10	<10	54.1	63.1	<10	15	<10	<10	<10	<10	<10		
C3 Naphthalene : Dry Wt	261	88.6	89.2	1540	4230	4550	552	100	54	96.7	<10	<10	434	340	147	221	64.7	65.5	92.3	<10	<10		
C3 Phenanthrene : Dry Wt	67.8	32.4	54.9	770	1480	2160	318	36	15.5	16.4	26.9	<10	169	148	84.8	113	<10	<10	<10	19.6	<10		
C4 Chrysene : Dry Wt	<10	<10	<10	22.7	65.7	119	11.9	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C4 Naphthalene : Dry Wt	74.4	15.6	<10	662	2270	2540	274	37.9	18.7	22.5	<10	<10	176	173	59.6	75.7	18.2	19.3	30.9	<10	<10		
C4 Phenanthrene : Dry Wt	56.3	20.4	34.4	589	1050	1640	236	32.8	<10	<10	16	<10	133	116	56.9	82.8	<10	<10	<10	<10	<10		
Dibenzothiophene : Dry Wt	<10	<10	<10	34.6	173	200	11.4	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Perylene : Dry Wt	<10	<10	<10	11.9	166	289	15.4	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Acenaphthene : Dry Wt	4.13	<2	<2	40.9	317	264	21.8	2.55	<2	3.55	<2	<2	8.71	6.2	7.53	4.75	<2	<2	2.31	<2	<2	16	500
Acenaphthylene : Dry Wt	<2	<2	<2	16.6	249	453	27.8	<2	<2	<2	<2	<2	3.66	36.6	<2	3.14	<2	<2	<2	<2	<2	44	640
Anthracene : Dry Wt	3.05	<2	3.57	71.3	567	748	40.5	2.61	<2	<2	<2	<2	10.1	13.4	11.9	9.61	<2	<2	<2	<2	<2	85.3	1100
Benzo(a)anthracene : Dry Wt	6.59	5.2	6.69	104	721	1230	86.1	8.95	4.89	7.73	10.9	3.28	17.2	25.9	43.6	31.3	4.16	2.64	3.65	7.34	<2	261	1600
Benzo(a)pyrene : Dry Wt	3.87	3.69	3.79	66.8	675	1150	70.5	6.8	3.77	7.32	9.73	3.15	11	17.1	32.8	24.3	3.43	<2	2.53	6.22	<2	430	1600
Benzo(b)fluoranthene : Dry Wt	<10	<10	<10	78.2	569	117	83.7	13.1	10.6	19.7	26.2	<10	15.7	18.1	35.8	35.3	<10	<10	<10	18.4	<10		
Benzo(ghi)perylene : Dry Wt	<10	<10	<10	79.4	387	673	60.8	<10	<10	12.3	14.9	<10	11.1	11.5	19.3	25.2	<10	<10	<10	11.8	<10		
Benzo(k)fluoranthene : Dry Wt	<10	<10	<10	28.1	256	503	32	<10	<10	<10	<10	<10	<10	<10	14.9	12.1	<10	<10	<10	<10	<10		
Chrysene + Triphenylene : Dry Wt	7.58	5.91	7.25	107	755	1280	78.7	9.04	5.36	6.83	10.1	<3	18.9	25.4	38.1	30.7	4.49	3.09	4.23	9.25	<3		
Dibenzo(ah)anthracene : Dry Wt	<5	<5	<5	10.7	94.1	172	12.2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	63.4	260
Fluoranthene : Dry Wt	11.3	7.75	9.37	165	1330	2210	137	11.9	6.53	8.98	13.9	3.27	26.5	29.8	71.4	44.6	4.84	2.8	4.55	11.5	2.35	600	5100
Fluorene : Dry Wt	10.8	<10	<10	97.2	444	502	34.2	<10	<10	<10	<10	<10	18.2	13.4	10.4	<10	<10	<10	<10	<10	<10	19	540
Indeno(1,2,3-c,d)pyrene : Dry Wt	<10	<10	<10	34.3	299	512	50.3	<10	<10	12.4	16.3	<10	<10	<10	17	20.6	<10	<10	<10	12.2	<10		
Naphthalene : Dry Wt	129	33.6	34.1	518	1810	2050	169	54.5	40.5	45.1	<30	<30	145	97	51.6	63.6	44.6	52.1	46.4	<30	<30	160	2100
Phenanthrene : Dry Wt	25.2	15.6	24.9	413	2130	2600	171	14.4	<10	10.1	16	<10	67.9	63	63.8	46.2	<10	<10	<10	12.4	<10	240	1500
Pyrene : Dry Wt	12.7	8.85	10.6	165	1140	1900	125	11.7	5.97	6.61	11.7	<3	27	35.2	60.2	41	5.43	3.16	4.59	10.3	<3	665	2600
PAH : Total : Dry Wt : mg/kg	<0.244	<0.126	<0.142	1.85	10.7	14.6	1.07	<0.164	<0.123	<0.150	<0.164	<0.104	<0.377	<0.382	<0.430	<0.356	<0.123	<0.124	<0.123	<0.139	<0.100		
Total Hydrocarbons: Dry Wt: mg/kg	19.1	10	31.6	397	700	1590	178	38.7	10.5	10.9	15.2	7.39	38	23.4	42.3	50.3	7.44	4.52	11	14.6	4.03		

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Table D.9 **Hydrocarbons Results and Comparison to the ISQG and PEL - CCME, 1999.**

Unless specified, concentrations in µg/kg	TCC - Chem - 1	TCC - Chem - 3	TCC - Chem - 5	TCC - Chem - 6	TCC - Chem - 9	TCC - Chem - 10	TCC - Chem - 12	TCC - Chem - 18	TCC - Chem - 27	TCC - Chem - 40	TCC - Chem - 48	TCC - Chem - 54	TCC - Chem - 61	TCC - Chem - 62	TCC - Chem - 64	TCC - Chem - 75	TCC - Chem - 86	TCC - Chem - 95	TCC - Chem - 102	TCC - Chem - 109	TCC - Chem - 114	ISQG	PEL
Benzo(b)anthracene : Dry Wt	<10	<10	<10	<10	40.3	57.1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Benzo(e)pyrene : Dry Wt	<10	<10	<10	88.6	540	963	76	<10	<10	11.7	17.2	<10	17.3	19.7	30.2	30.3	<10	<10	<10	12.5	<10		
Benzo(j)fluoranthene : Dry Wt	<10	<10	<10	34.5	316	504	38.1	<10	<10	<10	<10	<10	<10	<10	10.5	15.6	<10	<10	<10	<10	<10		
C1 Chrysene : Dry Wt	<10	<10	<10	232	743	1140	120	<10	<10	<10	<10	<10	38	51.5	33.6	39.6	<10	<10	<10	<10	<10		
C1 Dibenzothiophene : Dry Wt	<10	<10	<10	115	392	565	40.3	<10	<10	<10	<10	<10	<10	16.5	<10	<10	<10	<10	<10	<10	<10		
C1 Fluoanthene : Dry Wt	32.9	23.3	36.8	477	1450	2270	255	30	17.4	17	32.3	<10	97.9	139	94.7	91.2	12.8	<10	<10	25	<10		
C1 Fluorene : Dry Wt	14.2	<10	<10	230	767	1020	69.1	<10	<10	<10	<10	<10	40.7	37	16.9	16.4	<10	<10	<10	<10	<10		
C1 Naphthalene : Dry Wt	151	51.7	77.5	1340	3660	4060	340	55.1	30.3	31.2	<10	<10	261	187	90	121	44.8	34.2	48.6	<10	<10		
C1 Phenanthrene : Dry Wt	50.6	27.5	50.6	816	2180	3020	315	28.1	17.5	21.2	31.6	<10	152	156	87.3	99.5	12.7	<10	16.8	16.8	<10		
C2 Chrysene : Dry Wt	<10	<10	<10	115	261	398	47.9	<10	<10	<10	<10	<10	<10	13.4	<10	12.4	<10	<10	<10	<10	<10		
C2 Dibenzothiophene : Dry Wt	28.9	<10	<10	175	439	309	69.3	<10	<10	<10	<10	<10	33.2	21.6	<10	26.5	<10	<10	<10	<10	<10		
C2 Fluorene : Dry Wt	15.8	<10	<10	340	1180	1510	124	<10	<10	<10	<10	<10	58.6	70.7	17.1	28	<10	<10	<10	<10	<10		
C2 Naphthalene : Dry Wt	181	59.4	107	1510	4020	4400	458	58.8	32.7	47.3	<10	<10	342	278	123	171	50.6	48.4	63.6	<10	<10		
C2 Phenanthrene : Dry Wt	73.1	37.5	66.2	913	1980	2910	358	38.8	17.4	23.6	34.5	<10	202	166	96.4	127	17.6	11.1	15.4	15.4	<10		
C3 Chrysene : Dry Wt	<10	<10	<10	100	249	514	38.6	<10	<10	<10	<10	<10	<10	<10	<10	11.8	<10	<10	<10	<10	<10		
C3 Dibenzothiophene : Dry Wt	15.5	<10	<10	112	269	503	50.7	<10	<10	<10	<10	<10	17	<10	<10	<10	<10	<10	<10	<10	<10		
C3 Fluorene : Dry Wt	23.5	<10	<10	393	1040	1420	96.1	<10	<10	<10	<10	<10	54.1	63.1	<10	15	<10	<10	<10	<10	<10		
C3 Naphthalene : Dry Wt	261	88.6	89.2	1540	4230	4550	552	100	54	96.7	<10	<10	434	340	147	221	64.7	65.5	92.3	<10	<10		
C3 Phenanthrene : Dry Wt	67.8	32.4	54.9	770	1480	2160	318	36	15.5	16.4	26.9	<10	169	148	84.8	113	<10	<10	<10	19.6	<10		
C4 Chrysene : Dry Wt	<10	<10	<10	22.7	65.7	119	11.9	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C4 Naphthalene : Dry Wt	74.4	15.6	<10	662	2270	2540	274	37.9	18.7	22.5	<10	<10	176	173	59.6	75.7	18.2	19.3	30.9	<10	<10		
C4 Phenanthrene : Dry Wt	56.3	20.4	34.4	589	1050	1640	236	32.8	<10	<10	16	<10	133	116	56.9	82.8	<10	<10	<10	<10	<10		
Dibenzothiophene : Dry Wt	<10	<10	<10	34.6	173	200	11.4	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Perylene : Dry Wt	<10	<10	<10	11.9	166	289	15.4	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Acenaphthene : Dry Wt	4.13	<2	<2	40.9	317	264	21.8	2.55	<2	3.55	<2	<2	8.71	6.2	7.53	4.75	<2	<2	2.31	<2	<2	6.71	88.9
Acenaphthylene : Dry Wt	<2	<2	<2	16.6	249	453	27.8	<2	<2	<2	<2	<2	3.66	36.6	<2	3.14	<2	<2	<2	<2	<2	5.87	128
Anthracene : Dry Wt	3.05	<2	3.57	71.3	567	748	40.5	2.61	<2	<2	<2	<2	10.1	13.4	11.9	9.61	<2	<2	<2	<2	<2	46.9	245
Benzo(a)anthracene : Dry Wt	6.59	5.2	6.69	104	721	1230	86.1	8.95	4.89	7.73	10.9	3.28	17.2	25.9	43.6	31.3	4.16	2.64	3.65	7.34	<2		
Benzo(a)pyrene : Dry Wt	3.87	3.69	3.79	66.8	675	1150	70.5	6.8	3.77	7.32	9.73	3.15	11	17.1	32.8	24.3	3.43	<2	2.53	6.22	<2	88.8	763
Benzo(b)fluoranthene : Dry Wt	<10	<10	<10	78.2	569	117	83.7	13.1	10.6	19.7	26.2	<10	15.7	18.1	35.8	35.3	<10	<10	<10	18.4	<10		
Benzo(ghi)perylene : Dry Wt	<10	<10	<10	79.4	387	673	60.8	<10	<10	12.3	14.9	<10	11.1	11.5	19.3	25.2	<10	<10	<10	11.8	<10		
Benzo(k)fluoranthene : Dry Wt	<10	<10	<10	28.1	256	503	32	<10	<10	<10	<10	<10	<10	<10	14.9	12.1	<10	<10	<10	<10	<10		
Chrysene + Triphenylene : Dry Wt	7.58	5.91	7.25	107	755	1280	78.7	9.04	5.36	6.83	10.1	<3	18.9	25.4	38.1	30.7	4.49	3.09	4.23	9.25	<3		
Dibenzo(ah)anthracene : Dry Wt	<5	<5	<5	10.7	94.1	172	12.2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	6.22	135
Fluoranthene : Dry Wt	11.3	7.75	9.37	165	1330	2210	137	11.9	6.53	8.98	13.9	3.27	26.5	29.8	71.4	44.6	4.84	2.8	4.55	11.5	2.35	113	1494
Fluorene : Dry Wt	10.8	<10	<10	97.2	444	502	34.2	<10	<10	<10	<10	<10	18.2	13.4	10.4	<10	<10	<10	<10	<10	<10	21.2	144
Indeno(1,2,3-c,d)pyrene : Dry Wt	<10	<10	<10	34.3	299	512	50.3	<10	<10	12.4	16.3	<10	<10	<10	17	20.6	<10	<10	<10	12.2	<10		
Naphthalene : Dry Wt	129	33.6	34.1	518	1810	2050	169	54.5	40.5	45.1	<30	<30	145	97	51.6	63.6	44.6	52.1	46.4	<30	<30	34.6	391
Phenanthrene : Dry Wt	25.2	15.6	24.9	413	2130	2600	171	14.4	<10	10.1	16	<10	67.9	63	63.8	46.2	<10	<10	<10	12.4	<10	86.7	544
Pyrene : Dry Wt	12.7	8.85	10.6	165	1140	1900	125	11.7	5.97	6.61	11.7	<3	27	35.2	60.2	41	5.43	3.16	4.59	10.3	<3	153	1398
PAH : Total : Dry Wt : mg/kg	<0.244	<0.126	<0.142	1.85	10.7	14.6	1.07	<0.164	<0.123	<0.150	<0.164	<0.104	<0.377	<0.382	<0.430	<0.356	<0.123	<0.124	<0.123	<0.139	<0.100		
Total Hydrocarbons: Dry Wt: mg/kg	19.1	10	31.6	397	700	1590	178	38.7	10.5	10.9	15.2	7.39	38	23.4	42.3	50.3	7.44	4.52	11	14.6	4.03		

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Teesside Cable Corridor

Table D.10 **Metals, Metalloids and Non-Metals Results and Comparison to the ERL and ERM - Long*et al.*, 1995.**

Unless specified, concentrations in mg/kg	TCC - Chem - 1	TCC - Chem - 3	TCC - Chem - 5	TCC - Chem - 6	TCC - Chem - 9	TCC - Chem - 10	TCC - Chem - 12	TCC - Chem - 18	TCC - Chem - 27	TCC - Chem - 40	TCC - Chem - 48	TCC - Chem - 54	TCC - Chem - 61	TCC - Chem - 62	TCC - Chem - 64	TCC - Chem - 75	TCC - Chem - 86	TCC - Chem - 95	TCC - Chem - 102	TCC - Chem - 109	TCC - Chem - 114	*Effect Range Low (ERL)*	*Effect Range Median (ERM)*
Aluminium, HF Digest : Dry Wt	22000	19800	22500	39200	51800	67100	32300	25800	35700	40300	51100	32000	37200	24600	22100	54300	11800	22000	28100	42300	18500		
Barium, HF Digest : Dry Wt	1170	1770	1980	1680	753	465	270	295	358	357	629	262	822	1190	1320	388	262	253	297	411	240		
Iron, HF Digest : Dry Wt	33400	40400	44000	41200	35400	38700	25200	13100	18400	22200	29700	18600	33700	37000	32400	32900	24500	12600	13400	23700	10700		
Arsenic, HF Digest : Dry Wt	15.3	15.1	19.8	21.1	21.1	28.3	22	8.91	8.27	10.2	15.6	8.46	20	15.3	7.14	25.5	9.87	9.42	9.77	10.1	6.74	8.2	70
Cadmium, HF Digest : Dry Wt	0.134	0.132	0.14	0.16	0.184	0.213	0.152	0.087	0.092	0.095	0.132	0.1	0.152	0.143	0.165	0.136	0.079	0.082	0.076	0.1	0.053	1.2	9.6
Chromium, HF Digest : Dry Wt	292	275	292	191	109	136	372	243	168	130	129	223	126	312	387	221	193	233	164	103	66	81	370
Copper, HF Digest : Dry Wt	102	105	76.7	47.1	43.7	74.4	203	105	75.5	50.4	49.4	166	55.9	121	196	62.7	116	88.8	138	70.3	63.5	34	270
Lead, HF Digest : Dry Wt	48.9	51.8	52.2	74.7	88	138	82.5	32.8	32.7	39.4	81.4	30.3	58	53.5	54.2	104	29.4	25.5	26.5	35.9	14.9	46.7	218
Lithium, HF Digest : Dry Wt	20.6	18	19.9	37.1	52	76.1	25.7	16.2	18.9	24.3	46.7	17.8	35.1	22.1	20.2	53.2	15.1	11.3	14.5	25.6	9.57		
Manganese, HF Digest : Dry Wt	599	735	835	711	658	814	754	468	380	460	583	540	657	709	685	881	887	562	880	461	299		
Mercury	0.008	0.005	0.007	0.034	0.048	0.267	0.051	0.007	0.003	0.013	0.018	0.006	0.046	0.009	0.008	0.049	0.003	0.002	0.002	0.016	<0.002	0.15	0.71
Nickel, HF Digest : Dry Wt	145	136	88.8	53.9	46.9	58.8	222	137	85.8	58	55.3	116	56.8	149	220	118	106	136	90.6	43.5	41.4	20.9	51.6
Tin, HF Digest : Dry Wt	2.5	2.33	3.84	4.91	4.17	5.42	2.4	1.12	2.07	1.95	3.64	1.4	2.68	3.3	2.2	4.05	1.17	0.86	1.17	2.46	0.67		
Vanadium, HF Digest : Dry Wt	54	66.5	75.7	82.8	80.8	108	62.1	40.4	42.6	65.1	83.1	61.9	64	61	51.4	94.7	31.1	25.6	34.1	66.2	27.6		
Zinc : HF Digest : Dry Wt	104	111	118	122	137	169	106	49.2	54.6	64.9	110	70.5	113	115	112	118	50.3	41.2	51.9	69	31	150	410
Boron, Boiling water soluble : Dry Wt	3.19	3.24	3.48	9.13	10.2	19.2	5.05	4.31	6.67	5.36	6.93	4.36	4.49	4.06	7.96	6.62	4.57	4.01	4.45	4.87	3.73		
Selenium : Dry Wt	<0.1	<0.1	<0.1	0.3	0.335	0.665	<0.1	<0.1	0.108	<0.1	0.135	<0.1	<0.1	<0.1	<0.1	0.13	<0.1	<0.1	<0.1	<0.1	<0.1		

Table D.11 **Metals, Metalloids and Non-Metals Results and Comparison to the AL1 and AL2 - CEFAS, 2003.**

Unless specified, concentrations in mg/kg	TCC - Chem - 1	TCC - Chem - 3	TCC - Chem - 5	TCC - Chem - 6	TCC - Chem - 9	TCC - Chem - 10	TCC - Chem - 12	TCC - Chem - 18	TCC - Chem - 27	TCC - Chem - 40	TCC - Chem - 48	TCC - Chem - 54	TCC - Chem - 61	TCC - Chem - 62	TCC - Chem - 64	TCC - Chem - 75	TCC - Chem - 86	TCC - Chem - 95	TCC - Chem - 102	TCC - Chem - 109	TCC - Chem - 114	*Action Level 1*	*Action Level 2*
Aluminium, HF Digest : Dry Wt	22000	19800	22500	39200	51800	67100	32300	25800	35700	40300	51100	32000	37200	24600	22100	54300	11800	22000	28100	42300	18500		
Barium, HF Digest : Dry Wt	1170	1770	1980	1680	753	465	270	295	358	357	629	262	822	1190	1320	388	262	253	297	411	240		
Iron, HF Digest : Dry Wt	33400	40400	44000	41200	35400	38700	25200	13100	18400	22200	29700	18600	33700	37000	32400	32900	24500	12600	13400	23700	10700		
Arsenic, HF Digest : Dry Wt	15.3	15.1	19.8	21.1	21.1	28.3	22	8.91	8.27	10.2	15.6	8.46	20	15.3	7.14	25.5	9.87	9.42	9.77	10.1	6.74	20	100
Cadmium, HF Digest : Dry Wt	0.134	0.132	0.14	0.16	0.184	0.213	0.152	0.087	0.092	0.095	0.132	0.1	0.152	0.143	0.165	0.136	0.079	0.082	0.076	0.1	0.053	0.4	5
Chromium, HF Digest : Dry Wt	292	275	292	191	109	136	372	243	168	130	129	223	126	312	387	221	193	233	164	103	66	40	400
Copper, HF Digest : Dry Wt	102	105	76.7	47.1	43.7	74.4	203	105	75.5	50.4	49.4	166	55.9	121	196	62.7	116	88.8	138	70.3	63.5	40	400
Lead, HF Digest : Dry Wt	48.9	51.8	52.2	74.7	88	138	82.5	32.8	32.7	39.4	81.4	30.3	58	53.5	54.2	104	29.4	25.5	26.5	35.9	14.9	50	500
Lithium, HF Digest : Dry Wt	20.6	18	19.9	37.1	52	76.1	25.7	16.2	18.9	24.3	46.7	17.8	35.1	22.1	20.2	53.2	15.1	11.3	14.5	25.6	9.57		
Manganese, HF Digest : Dry Wt	599	735	835	711	658	814	754	468	380	460	583	540	657	709	685	881	887	562	880	461	299		
Mercury	0.008	0.005	0.007	0.034	0.048	0.267	0.051	0.007	0.003	0.013	0.018	0.006	0.046	0.009	0.008	0.049	0.003	0.002	0.002	0.016	<0.002	0.3	3
Nickel, HF Digest : Dry Wt	145	136	88.8	53.9	46.9	58.8	222	137	85.8	58	55.3	116	56.8	149	220	118	106	136	90.6	43.5	41.4	20	200
Tin, HF Digest : Dry Wt	2.5	2.33	3.84	4.91	4.17	5.42	2.4	1.12	2.07	1.95	3.64	1.4	2.68	3.3	2.2	4.05	1.17	0.86	1.17	2.46	0.67		
Vanadium, HF Digest : Dry Wt	54	66.5	75.7	82.8	80.8	108	62.1	40.4	42.6	65.1	83.1	61.9	64	61	51.4	94.7	31.1	25.6	34.1	66.2	27.6		
Zinc : HF Digest : Dry Wt	104	111	118	122	137	169	106	49.2	54.6	64.9	110	70.5	113	115	112	118	50.3	41.2	51.9	69	31	130	800
Boron, Boiling water soluble : Dry Wt	3.19	3.24	3.48	9.13	10.2	19.2	5.05	4.31	6.67	5.36	6.93	4.36	4.49	4.06	7.96	6.62	4.57	4.01	4.45	4.87	3.73		
Selenium : Dry Wt	<0.1	<0.1	<0.1	0.3	0.335	0.665	<0.1	<0.1	0.108	<0.1	0.135	<0.1	<0.1	<0.1	<0.1	0.13	<0.1	<0.1	<0.1	<0.1	<0.1		

Table D.12 **Metals, Metalloids and Non-Metal Results and Comparison to the ISQG and PEL - CCME, 1999.**

Unless specified, concentrations in mg/kg	TCC - Chem - 1	TCC - Chem - 3	TCC - Chem - 5	TCC - Chem - 6	TCC - Chem - 9	TCC - Chem - 10	TCC - Chem - 12	TCC - Chem - 18	TCC - Chem - 27	TCC - Chem - 40	TCC - Chem - 48	TCC - Chem - 54	TCC - Chem - 61	TCC - Chem - 62	TCC - Chem - 64	TCC - Chem - 75	TCC - Chem - 86	TCC - Chem - 95	TCC - Chem - 102	TCC - Chem - 109	TCC - Chem - 114	*ISQG*	*PEL*
Aluminium, HF Digest : Dry Wt	22000	19800	22500	39200	51800	67100	32300	25800	35700	40300	51100	32000	37200	24600	22100	54300	11800	22000	28100	42300	18500		
Barium, HF Digest : Dry Wt	1170	1770	1980	1680	753	465	270	295	358	357	629	262	822	1190	1320	388	262	253	297	411	240		
Iron, HF Digest : Dry Wt	33400	40400	44000	41200	35400	38700	25200	13100	18400	22200	29700	18600	33700	37000	32400	32900	24500	12600	13400	23700	10700		
Arsenic, HF Digest : Dry Wt	15.3	15.1	19.8	21.1	21.1	28.3	22	8.91	8.27	10.2	15.6	8.46	20	15.3	7.14	25.5	9.87	9.42	9.77	10.1	6.74	7.24	41.6
Cadmium, HF Digest : Dry Wt	0.134	0.132	0.14	0.16	0.184	0.213	0.152	0.087	0.092	0.095	0.132	0.1	0.152	0.143	0.165	0.136	0.079	0.082	0.076	0.1	0.053	0.7	4.2
Chromium, HF Digest : Dry Wt	292	275	292	191	109	136	372	243	168	130	129	223	126	312	387	221	193	233	164	103	66	52.3	160
Copper, HF Digest : Dry Wt	102	105	76.7	47.1	43.7	74.4	203	105	75.5	50.4	49.4	166	55.9	121	196	62.7	116	88.8	138	70.3	63.5	18.7	108
Lead, HF Digest : Dry Wt	48.9	51.8	52.2	74.7	88	138	82.5	32.8	32.7	39.4	81.4	30.3	58	53.5	54.2	104	29.4	25.5	26.5	35.9	14.9	30.2	112
Lithium, HF Digest : Dry Wt	20.6	18	19.9	37.1	52	76.1	25.7	16.2	18.9	24.3	46.7	17.8	35.1	22.1	20.2	53.2	15.1	11.3	14.5	25.6	9.57		
Manganese, HF Digest : Dry Wt	599	735	835	711	658	814	754	468	380	460	583	540	657	709	685	881	887	562	880	461	299		
Mercury	0.008	0.005	0.007	0.034	0.048	0.267	0.051	0.007	0.003	0.013	0.018	0.006	0.046	0.009	0.008	0.049	0.003	0.002	0.002	0.016	<0.002	0.13	0.7
Nickel, HF Digest : Dry Wt	145	136	88.8	53.9	46.9	58.8	222	137	85.8	58	55.3	116	56.8	149	220	118	106	136	90.6	43.5	41.4		
Tin, HF Digest : Dry Wt	2.5	2.33	3.84	4.91	4.17	5.42	2.4	1.12	2.07	1.95	3.64	1.4	2.68	3.3	2.2	4.05	1.17	0.86	1.17	2.46	0.67		
Vanadium, HF Digest : Dry Wt	54	66.5	75.7	82.8	80.8	108	62.1	40.4	42.6	65.1	83.1	61.9	64	61	51.4	94.7	31.1	25.6	34.1	66.2	27.6		
Zinc : HF Digest : Dry Wt	104	111	118	122	137	169	106	49.2	54.6	64.9	110	70.5	113	115	112	118	50.3	41.2	51.9	69	31	124	271
Boron, Boiling water soluble : Dry Wt	3.19	3.24	3.48	9.13	10.2	19.2	5.05	4.31	6.67	5.36	6.93	4.36	4.49	4.06	7.96	6.62	4.57	4.01	4.45	4.87	3.73		
Selenium : Dry Wt	<0.1	<0.1	<0.1	0.3	0.335	0.665	<0.1	<0.1	0.108	<0.1	0.135	<0.1	<0.1	<0.1	<0.1	0.13	<0.1	<0.1	<0.1	<0.1	<0.1		

APPENDIX D – CONTAMINANT ANALYSIS

Teesside Cable Corridor

Table D.13 **PCB Results and Comparison to the AL1 and AL2 - CEFAS, 2003.**

Unless specified, concentrations in µg/kg	TCC - Chem - 1	TCC - Chem - 3	TCC - Chem - 5	TCC - Chem - 6	TCC - Chem - 9	TCC - Chem - 10	TCC - Chem - 12	TCC - Chem - 18	TCC - Chem - 27	TCC - Chem - 40	TCC - Chem - 48	TCC - Chem - 54	TCC - Chem - 61	TCC - Chem - 62	TCC - Chem - 64	TCC - Chem - 75	TCC - Chem - 86	TCC - Chem - 95	TCC - Chem - 102	TCC - Chem - 109	TCC - Chem - 114	*Action Level 1*	*Action Level 2*
PCB - 028 : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	0.84	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 052 : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 101 : Dry Wt	<0.1	<0.1	<0.1	<0.1	0.32	1.04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 118 : Dry Wt	<0.1	<0.1	<0.1	<0.1	0.24	0.92	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 138 : Dry Wt	<0.1	<0.1	<0.1	<0.1	0.28	1.04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 153 : Dry Wt	<0.1	<0.1	<0.1	<0.1	0.36	1.16	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
PCB - 180 : Dry Wt	<0.1	<0.1	<0.1	<0.1	<0.1	<0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Sum ICES 7	<LoD	<LoD	<LoD	<LoD	1.2	5	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	<LoD	10	None

Table D.14 **Organotins Results**

Unless specified, concentrations in µg/kg	TCC - Chem - 1	TCC - Chem - 3	TCC - Chem - 5	TCC - Chem - 6	TCC - Chem - 9	TCC - Chem - 10	TCC - Chem - 12	TCC - Chem - 18	TCC - Chem - 27	TCC - Chem - 40	TCC - Chem - 48	TCC - Chem - 54	TCC - Chem - 61	TCC - Chem - 62	TCC - Chem - 64	TCC - Chem - 75	TCC - Chem - 86	TCC - Chem - 95	TCC - Chem - 102	TCC - Chem - 109	TCC - Chem - 114
Dibutyl Tin : Dry Wt as Cation	<4	<4	<4	<4	<5	<6	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Dioctyl Tin : Dry Wt as Cation	<3	<3	<3	<3	<3	<4	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Diphenyl Tin : Dry Wt as Cation	<3	<3	<3	<3	<3	<4	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Tetrabutyl Tin : Dry Wt as Cation	<3	<3	<3	<3	<3	<4	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Tributyl Tin : Dry Wt as Cation	<3	<3	<3	<3	<3	<4	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Triphenyl Tin : Dry Wt as Cation	<3	<3	<3	<3	<3	<4	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3

APPENDIX E – MACROFAUNA ANALYSIS

Tranche B

Teesside Cable Corridor

APPENDIX E – MACROFAUNAL ANALYSIS

Tranche B

Table E.1 Tranche B Macrofauna Taxa List

Phylum Class/Order	Taxon	SAMPLES																																																			Total
		TB_01	TB_02	TB_03	TB_04	TB_05	TB_06	TB_07	TB_08	TB_09	TB_10	TB_11	TB_12	TB_13	TB_14	TB_15	TB_16	TB_17	TB_18	TB_19	TB_20	TB_21	TB_22	TB_23	TB_24	TB_25	TB_26	TB_27	TB_28	TB_29	TB_30	TB_32	TB_33	TB_34	TB_35	TB_36	TB_37	TB_38	TB_39	TB_40	TB_41	TB_42	TB_43	TB_44	TB_45	TB_46	TB_48	TB_49	TB_50	TB_51	TB_52	TB_53	
Taxa included in Statistical Analysis																																																					
Annelida - Polychaeta	*Pisione remota*																																																1				1
	Polynoidae																														1																7	1	2				11
	Polynoidae juv.																																															2					2
	Subadyte pellucida																																															2				2	4
	Gattyana cirrhosa																		1						1						6						1					1					2	2	1				15
	Harmothoe																														6																1	2				1	10
	Harmothoe extenuata																																															1					1
	Harmothoe impar																																															3				1	4
	Malmgreniella darbouxi							1						1			1		1												2																1						7
	Malmgreniella ljungmani																																										1										1
	Malmgreniella mcintoshi																																														2						2
	Pholoe baltica																2		3		3					1					8			1		1	2		1				1				7		3	1		4	38
	Pholoe inornata																																															21	4				25
	Sigalion mathildae	10	6	4	4	3	4	6	3	7	1	5	2	8	1	5	1	1	5	1	4	1	6	5	2	4	6	7	4	8		1	2			2	2	4	4	2	1	1	3	1	2	3				2	2		156
	Sthenelais																																												1								1
	Sthenelais limicola																1								1																1												3
	Eteone longa						1					1					1	3					1				3					1		1	2						1						1		3			1	20
	Hypereteone foliosa																																									1											1
	Phyllodoce groenlandica	1									1										1						1		1			1																					6
	Phyllodoce rosea																		1																			1															2
	Eulalia																														1																	8	2				11
	Eulalia viridis																																															7					7
	Eumida																																	1														2	2			1	6
	Eumida bahusiensis										1																																1										2
	Eumida sanguinea																																														1						1
	Glycera juv.																																																1				1
	Glycera alba																																															1					1
	Glycera fallax																																														1						1
	Glycera lapidum																																														1	2	3				6
	Goniadidae juv.				1																										1																						2
	Glycinde nordmanni													1												2								2		1				1							1		1				9
	Goniada maculata	1	1	1	1	1	2	1	2	1		1	1	1		1	1	2	2	3	3	1	4		1	1	1		1	1	2	1	1	1		1	1	8	3	1	1	1	2	2	2	3		2	2	3	2		75
	Goniadella gracilis																																														2						2
	Sphaerodorum gracilis																																															4					4
	Nereimyra punctata																														3																	6	1			2	12
	Podarkeopsis capensis	1				1				1											1														1	2																	7
	Nereididae juv.																															1																					1
	Nephtys										1																																										1
	Nephtys juv.	1	1	3	2	2			1		2		3	4		1				2	2	4	1			1		2	1	1		1	3					4	2	1	6			2		7							60
	Nephtys assimilis				1								1								1						1							1									1	1						1			8
	Nephtys caeca																																					1															1
	Nephtys cirrosa	3	1	1					2		1		3		1							4				2								1			1	1	3		1					1							26
	Nephtys hombergii																																		1																		1
	Orbinia latreillii																											1																									1
	Orbinia (Orbinia) sertulata																															1																					1
	Scoloplos (Scoloplos) armiger					1																				2																										1	4
	Poecilochaetus serpens		1																	1																							3										5
	Aonides paucibranchiata																																														1	2	11				14
	Laonice bahusiensis																																														2		3			1	6
	Dipolydora coeca																														2										1							1					4
	Dipolydora caulleryi																																																1				1
	Scolelepis bonnieri				1		1		1			1	1	1						1			3			1		1	1	1		1		1							1			1	1					1			20
	Scolelepis korsuni				1										1		1																																				3
	Spio filicornis					1				1		1					1																																	1			5
	Spiophanes bombyx	113	93	21	86	79	55	76	125	13	10	120	31	100	55	12	120	98	173	66	40	24	123	66	73	81	18	96	58	70	2	88	51	24	39	38	58	62	45	21	75	39	26	44	58	35		3	4	46	45	1	2899
	Spiophanes kroyeri																																		1														1				2
	Magelona alleni																	1			1														1	1																	4
	Magelona filiformis	1		4	4	1		1	3	1	2	12	1	7	1		5	4	6	1		2	12		2	3	4	1	2	1				1	3		2	2	1	1			2	3	3								99
	Magelona johnstoni	3		1	4	5	5	2	1	2	1	7		4	2		1		3		2	1	5	2		3	5	3	3	3		9	2	3	4	1	1			4	4	2			2								100
	Caulleriella alata																																														1					4	5
	Chaetozone christiei						1	1			1	5	1	3		1	2	2	1		1	1	1			1	1		2		1		1		2	2			1		3		1	1	1	1			1				40
	Dodecaceria																														1																	7					8
	Pherusa juv.																																															1					1
	Mediomastus fragilis																																														2	6	13			11	32
	Notomastus latericeus	1		1														3					1											2													20					1	29
	Maldanidae						1																												1																		2
	Clymenura	1						1								1		1									1																										5
	Ophelia juv.																				1																																1
	Ophelia borealis																												1					1			1				2												5
	Scalibregma inflatum																														4																	1		1			6
	Galathowenia oculata																		1																																		1
	Owenia fusiformis	16	4	1	4	12	2	3	14	1		1	5	7	3	2	3	1	6	4	2	2		2	5	3	1	2	3	7	2	5	3	8	7	6	18	11	4	10	2	4	8	8	5	4	1	6	1	6	2	1	238
	Lagis koreni	1	1	1		1		1		3	1	1	1				3	21	19	2	3		3	14	6	2	12		7		5	1		1	10			5	1	4		4	14		3		1	2	1	5	22	1	183
	Lanice conchilega	3			2	1	1	2	2	2	4	11	1		10	10	12	24	5	13	3		4		14	3	12		4	8	4	1	3	34	31	8	4	15		1	3	10	21	1	2		6		1	31	18		345
	Polycirrus																														4																1	1				1	7
	Chone																								1																						3	5					9
	Hydroides norvegicus																														1																					1	2
	Spirobranchus																														21																5	70	27			15	138
	Spirobranchus lamarcki																																														2	51	20			8	81
	Spirobranchus triqueter																														29																6	82				33	150
Arthropoda - Pycnogonida	*Callipallene brevirostris*																														1																						1
	Anoplodactylus petiolatus																					1																												1			2
Crustacea	*Gastrosaccus spinifer*																				1																																1
	Amphipoda																		1																																		1
	Oedicerotidae																	1																																			1
	Perioculodes longimanus		1	2					1	1										1												1												1		1							9
	Pontocrates arcticus													1																																							1
	Synchelidium maculatum													1		2				1						1		1	1																						1		8
	Amphilochus neapolitanus																																						1														1
	Leucothoe incisa		2				1					1	1	2	1		1							1		1			3	2		1				2										1							20
	Urothoe				1			2															1														2																6
	Urothoe elegans					3		3									8		4	1	1				1											2	2					1											26
	Urothoe poseidonis	8	1	3	7	1		4	1	1	2	1		5	4	3	6	9	2	2	1		1	1		1	1		3	5		1	4	5	2	9	1				2	3	1	1	1	2							105
	Acidostoma obesum					1																																															1

APPENDIX E – MACROFAUNAL ANALYSIS

Tranche B

Phylum Class/Order	**Taxon**	**SAMPLES**																																																			**Total**
		TB_01	TB_02	TB_03	TB_04	TB_05	TB_06	TB_07	TB_08	TB_09	TB_10	TB_11	TB_12	TB_13	TB_14	TB_15	TB_16	TB_17	TB_18	TB_19	TB_20	TB_21	TB_22	TB_23	TB_24	TB_25	TB_26	TB_27	TB_28	TB_29	TB_30	TB_32	TB_33	TB_34	TB_35	TB_36	TB_37	TB_38	TB_39	TB_40	TB_41	TB_42	TB_43	TB_44	TB_45	TB_46	TB_48	TB_49	TB_50	TB_51	TB_52	TB_53	
Taxa included in Statistical Analysis																																																					
	Hippomedon denticulatus																																													1							**1**
	Nototropis falcatus		1	1				2	2				3																																								**9**
	Atylus vedlomensis																																																1				**1**
	Ampelisca																											1			4					1																	**6**
	Ampelisca brevicornis	4							1			3		1		1			1	1	1			1	1		1	1	2	2		2		1				1						1		1					1		**28**
	Ampelisca diadema																														6																					1	**7**
	Ampelisca spinipes																																																2				**2**
	Ampelisca tenuicornis																		1	1																																	**2**
	Bathyporeia			9	4		1	1	3		1		4	2	1					2	2		1			2			1	1											2									1			**38**
	Bathyporeia elegans	7	2	8	1	2		2	5		2		10	2	1		6		3			5	5			5	1		3	2		3	3		1	2	2	3	3	2		1		3	6	2					1		**104**
	Bathyporeia guilliamsoniana	17	14	18	11	4	11	1	8	3	1	3	17	12	6	5	1		3	2	2	2	5	6		10	4	8	7	7		4		5	9	1		4	2	5	7		3	6	3	3				3	1		**244**
	Bathyporeia tenuipes											1						1												1																							**3**
	Megaluropus agilis	1				2													1																			1															**5**
	Melitidae juv.																																															1					**1**
	Abludomelita obtusata												1				1																																				**2**
	Cheirocratus																																									1					2		1				**4**
	Cheirocratus sundevalli																																														2						**2**
	Othomaera othonis																																															1					**1**
	Monocorophium sextonae																																															11	1				**12**
	Siphonoecetes (Centraloecetes) kroyeranus			1	1	3	2	1	5	1		1	1			2		2								1												1							1						1		**24**
	Pariambus typicus																1			1			2																														**4**
	Phtisica marina																1			1																																	**2**
	Gnathia																																															1					**1**
	Gnathia dentata																																															1					**1**
	Pseudoparatanais batei																																															4					**4**
	Tanaopsis graciloides																														1																						**1**
	Bodotria scorpioides																														1																						**1**
	Iphinoe trispinosa	1		1					1				1			1							1				1	1																									**8**
	Pseudocuma similis																																									1											**1**
	Diastylis bradyi	3	2	3		3	3	1	6	1		1	1		2	1			2	3				1				3		3		1							1						1								**42**
	Paguridae juv.																														1					1						1						1					**4**
	Galathea juv.																														1																		1				**2**
	Pisidia longicornis																																															1					**1**
	Ebalia tumefacta													1																																		1					**2**
	Corystes cassivelaunus											2										1	1						1				2										1		2	1				2			**13**
	Liocarcinus juv.																	1											2	1																							**4**
Mollusca	*Leptochiton asellus*																																															1					**1**
	Gibbula tumida																														6																						**6**
	Euspira pulchella	1				1		2			1	1	1		2	2								3		1		3	1	1		1	2	1		1		1					1	1	1		1		1	1	1		**33**
	Eulima bilineata																														1																						**1**
	Nassarius incrassatus																																															1					**1**
	Bela nebula														1				1																																		**2**
	Raphitoma linearis																																																			1	**1**
	Philine	1																																1		1								1	1		2			3			**10**
	Cylichna cylindracea																	1									1								2	1	2	3		1			4	1	3					2	1		**22**
	Onchidorididae juv.																																															2					**2**
	Tritonia																																															4					**4**
	Bivalvia									1					1									1				1	1	1		1				1	2					1				1		2	2				**16**
	Nucula																																																	1			**1**
	Mytilidae juv.																																															1					**1**
	Pectinidae juv.				1																																																**1**
	Anomiidae																																															5				1	**6**
	Thyasira																																													1							**1**
	Thyasira juv.																																					1															**1**
	Thyasira flexuosa									1	1		1						2															1									1					1			3		**11**
	Kurtiella bidentata									3			5	3		1	2	1	5		9				3	1					155			1	2	6			2						3						1	20	**223**
	Tellimya ferruginosa	5	5					3	1	6		1			4			3	2				1	4	2		1	3				2		3																			**46**
	Epilepton clarkiae																																									1											**1**
	Cardiidae juv.																2											1			1				1		1	1		1			1		2					3	1		**15**
	Mactridae juv.			2	1	2		1	7	1		7	4	2	2	3	4		4		2		11	1		1	3	2	4	1		6		1	4		2		2					1	4					1			**86**
	Mactra stultorum	1		3				1							1		1		1			1	2		1		2	1	2	3		1					1		1	1				2	1								**27**
	Spisula elliptica																																											1									**1**
	Spisula solida														1																																						**1**
	Lutraria juv.																1								1																												**2**
	Pharidae juv.	1						1		1						5					1			1														1															**11**
	Ensis		1																	1																						1											**3**
	Ensis juv.		2	1		4	2		2	1	13	5	2	4	2	3	6	3	3			2	6	1	3		5	1	4	4			5	16	7	1	3	4	1	13	2	9	9	7	12	3				8	7		**186**
	Ensis ensis	1						1																		1			1				1	1		1		2															**9**
	Phaxas pellucidus								1					1											1	1			1			1		1				1		2	1		3	1						3	4		**22**
	Angulus fabula	5	4	1	6		1		6	9	20	30	3	13	5	1	6	14	6	1	2	4	13	8		17	38	13	11	5		13	9	15	11	14	1	15	5	6	7	29	12	16	18	7				15	10		**445**
	Donax vittatus				1																																																**1**
	Gari juv.																											1																									**1**
	Gari fervensis							1													2				1	2			1							1																	**8**
	Abra juv.												2	1		1						1									1		1	2	2			1	1	2		1	2	2	4		1			2	1		**28**
	Abra alba																														2																					1	**3**
	Abra prismatica						1									1			2					1			1						2				1	2	1	3		1	3	4	1	3				1	3		**31**
	Arctica islandica juv.																												1							2						1	1							1	3		**9**
	Dosinia juv.	2	1		2	1		2	4	1		1	2	2	3	2		1	1		1	3	1		2	7			3	3	1		1	5	3	5		2	3		1	1	5	6	3	4				1	3		**89**
	Dosinia lupinus																				1					1																											**2**
	Polititapes virgineus																														1																						**1**
	Chamelea striatula																1								1							1	1	1	1	3		2				1				2							**14**
	Timoclea ovata																														3														2			3	1	1			**10**
	Mysia undata																		1							1								2	2	1			1				2		1						1		**12**
	Mya juv.																								1						10																3		1			1	**16**
	Corbula gibba									1			1								1																1													1			**5**
	Hiatella arctica																																															14	5				**19**
	Thracia																																			1															1		**2**
	Thracia juv.				1											2								1					2	1				1												2							**10**
	Thracia phaseolina	3	1				1										1	3					1				3		1	1			1		1	2				1			1	2		1			1				**25**
	Cochlodesma praetenue					1									1		1						1			1	1						2			1										2				1			**12**
Echinodermata - Asteroidea	Asteroidea juv.																														1																1	1				2	**5**
	Asterias rubens																																																1				**1**
Ophiuroidea	Ophiuroidea juv.					1					1		1		1	1		1	2						3	2		2			2				1	1	2					1	2	1	3		1	9	1	3	2	1	**45**
	Ophiothrix juv.																																																			9	**9**
	Ophiothrix fragilis																																															15				12	**27**

APPENDIX E – MACROFAUNAL ANALYSIS

Tranche B

Taxa included in Statistical Analysis (SAMPLES TB_01–TB_26)

Phylum Class/Order	Taxon	TB_01	TB_02	TB_03	TB_04	TB_05	TB_06	TB_07	TB_08	TB_09	TB_10	TB_11	TB_12	TB_13	TB_14	TB_15	TB_16	TB_17	TB_18	TB_19	TB_20	TB_21	TB_22	TB_23	TB_24	TB_25	TB_26
	Acrocnida brachiata	3		1	1			3				1	5	8	1	3	6	1	6	1	16				4	1	
	Amphiura filiformis																		2	1							
	Amphipholis squamata																										
	Ophiura albida																										
Echinoidea	Echinoidea juv.					3		1	8					3	7	2		1	2	8		3			11	1	5
	Psammechinus miliaris																										
	Echinocyamus pusillus			1		4	3	4			1			4		1	1		2	4						3	
	Echinocardium														1											1	
	Echinocardium cordatum	3	3		1			3		1		1		4	1			1	1				1	1	1		1
	Echinocardium flavescens																								1		
Holothuroidea	*Leptosynapta cruenta*																										
Cnideria	*Cerianthus lloydii*																										
	Actiniaria																				1						
	Edwardsiidae	3	1	3		4	1	2	1				2	4	5	4			4	4	4	1		2	5		
Nemertea	Nemertea								1				3					1	1	1					1		1
Sipuncula	Golfingiidae juv.																										
Phoronida	*Phoronis*						1	2	6	2	1	1		3	2				4				1			5	
Chordata	Ascidiacea juv.																										
	Dendrodoa grossularia																										
	Micrenophrys lilljeborgii																										
	Ammodytes marinus			1																							
	Pleuronectiformes juv.																										
	Individuals	**226**	**149**	**97**	**150**	**148**	**101**	**139**	**224**	**67**	**70**	**227**	**122**	**216**	**130**	**80**	**212**	**206**	**297**	**131**	**116**	**64**	**219**	**123**	**150**	**178**	**136**
	Taxa	**33**	**23**	**27**	**26**	**29**	**22**	**34**	**30**	**27**	**23**	**29**	**34**	**33**	**32**	**30**	**35**	**29**	**43**	**29**	**32**	**20**	**30**	**21**	**29**	**39**	**30**

Taxa included in Statistical Analysis (SAMPLES TB_27–TB_53, Total)

Phylum Class/Order	Taxon	TB_27	TB_28	TB_29	TB_30	TB_32	TB_33	TB_34	TB_35	TB_36	TB_37	TB_38	TB_39	TB_40	TB_41	TB_42	TB_43	TB_44	TB_45	TB_46	TB_48	TB_49	TB_50	TB_51	TB_52	TB_53	Total
	Acrocnida brachiata		2	2				3	2	2	5	1	1			1			2						2		**84**
	Amphiura filiformis								1			1															**5**
	Amphipholis squamata				1																	7				4	**12**
	Ophiura albida																					1					**1**
Echinoidea	Echinoidea juv.	1	4	7		3	3		1	3	4	2	9	7	3	3	5	29	36			1		2	10		**188**
	Psammechinus miliaris																					1	1				**2**
	Echinocyamus pusillus				1			3				2							3			4	3			1	**45**
	Echinocardium					1																					**3**
	Echinocardium cordatum	2																	1								**26**
	Echinocardium flavescens										1																**2**
Holothuroidea	*Leptosynapta cruenta*																				11						**11**
Cnideria	*Cerianthus lloydii*																					1					**1**
	Actiniaria				1																						**2**
	Edwardsiidae				1	1	1	1	1		2						1					1					**59**
Nemertea	Nemertea										1						1				1	5	5			2	**24**
Sipuncula	Golfingiidae juv.																					6					**6**
Phoronida	*Phoronis*	4		1	5	2		1	1	1	3						1		1			1	6	1	1		**57**
Chordata	Ascidiacea juv.				2																					2	**4**
	Dendrodoa grossularia																						2				**2**
	Micrenophrys lilljeborgii																									1	**1**
	Ammodytes marinus																										**1**
	Pleuronectiformes juv.	1																									**1**
	Individuals	**164**	**150**	**154**	**316**	**158**	**104**	**154**	**158**	**130**	**130**	**166**	**99**	**90**	**127**	**122**	**144**	**151**	**196**	**92**	**103**	**413**	**146**	**156**	**151**	**150**	**7902**
	Taxa	**28**	**37**	**30**	**46**	**32**	**23**	**38**	**33**	**38**	**31**	**33**	**25**	**22**	**22**	**28**	**34**	**30**	**37**	**25**	**35**	**62**	**43**	**34**	**29**	**35**	**211**

Juvenile (shaded rows)

Taxa excluded in Statistical Analysis (SAMPLES TB_01–TB_26)

Phylum Class/Order	Taxon	TB_01	TB_02	TB_03	TB_04	TB_05	TB_06	TB_07	TB_08	TB_09	TB_10	TB_11	TB_12	TB_13	TB_14	TB_15	TB_16	TB_17	TB_18	TB_19	TB_20	TB_21	TB_22	TB_23	TB_24	TB_25	TB_26
Porifera	*Cliona*																										
Cnidaria	*Tubularia*					P											P										
	Filifera																										
	Bougainvilliidae																										
	Lovenella clausa				P	P	P					P		P	P	P	P							P	P	P	
	Campanulariidae																										
	Clytia hemisphaerica																										
	Obelia																										
Anthozoa	*Alcyonium digitatum*																										
Nemertea	Nematoda							1																			
Arthropoda	*Verruca stroemia*																										
	Copepoda						2							1						1							
Byozoa	*Crisia*																										
	Electra pilosa																										
	Callopora dumerilii																										
	Scrupocellaria scruposa																										
	Cribrilina punctata																										
	Chorizopora brongniartii																										
	Escharella immersa																										

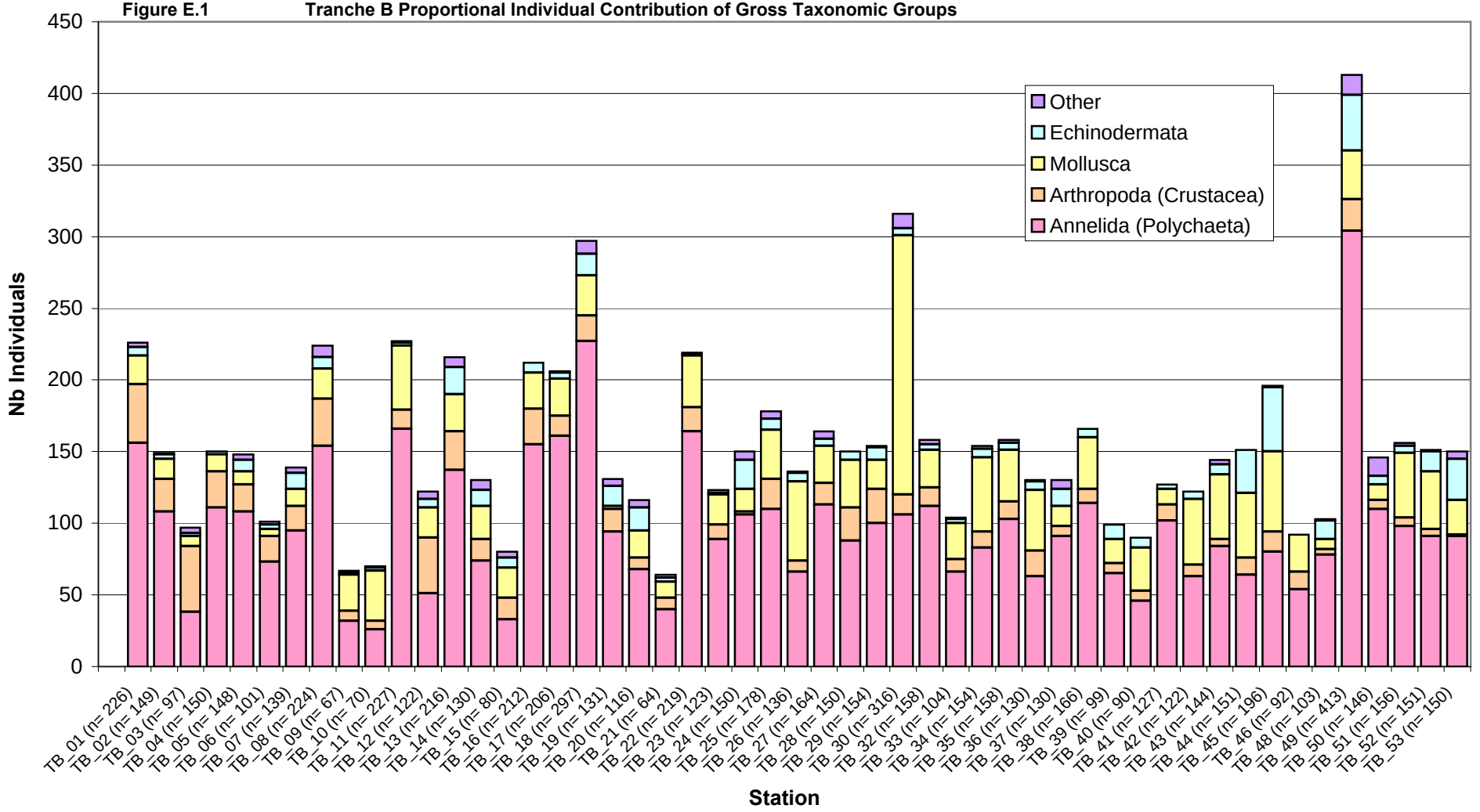
Taxa excluded in Statistical Analysis (SAMPLES TB_27–TB_53, Total)

Phylum Class/Order	Taxon	TB_27	TB_28	TB_29	TB_30	TB_32	TB_33	TB_34	TB_35	TB_36	TB_37	TB_38	TB_39	TB_40	TB_41	TB_42	TB_43	TB_44	TB_45	TB_46	TB_48	TB_49	TB_50	TB_51	TB_52	TB_53	Total
Porifera	*Cliona*								P																		
Cnidaria	*Tubularia*					P				P																	
	Filifera																							P			
	Bougainvilliidae				P					P																	
	Lovenella clausa							P	P			P		P			P		P	P				P			
	Campanulariidae																							P			
	Clytia hemisphaerica															P											
	Obelia				P																						
Anthozoa	*Alcyonium digitatum*																				P	P				P	
Nemertea	Nematoda																				1		7			1	**10**
Arthropoda	*Verruca stroemia*																									2	**2**
	Copepoda																										**4**
Byozoa	*Crisia*																									P	
	Electra pilosa																									P	
	Callopora dumerilii																									P	
	Scrupocellaria scruposa																					P				P	
	Cribrilina punctata																					P					
	Chorizopora brongniartii																									P	
	Escharella immersa				P																P					P	

APPENDIX E - MACROFAUNAL ANALYSIS

Tranche B

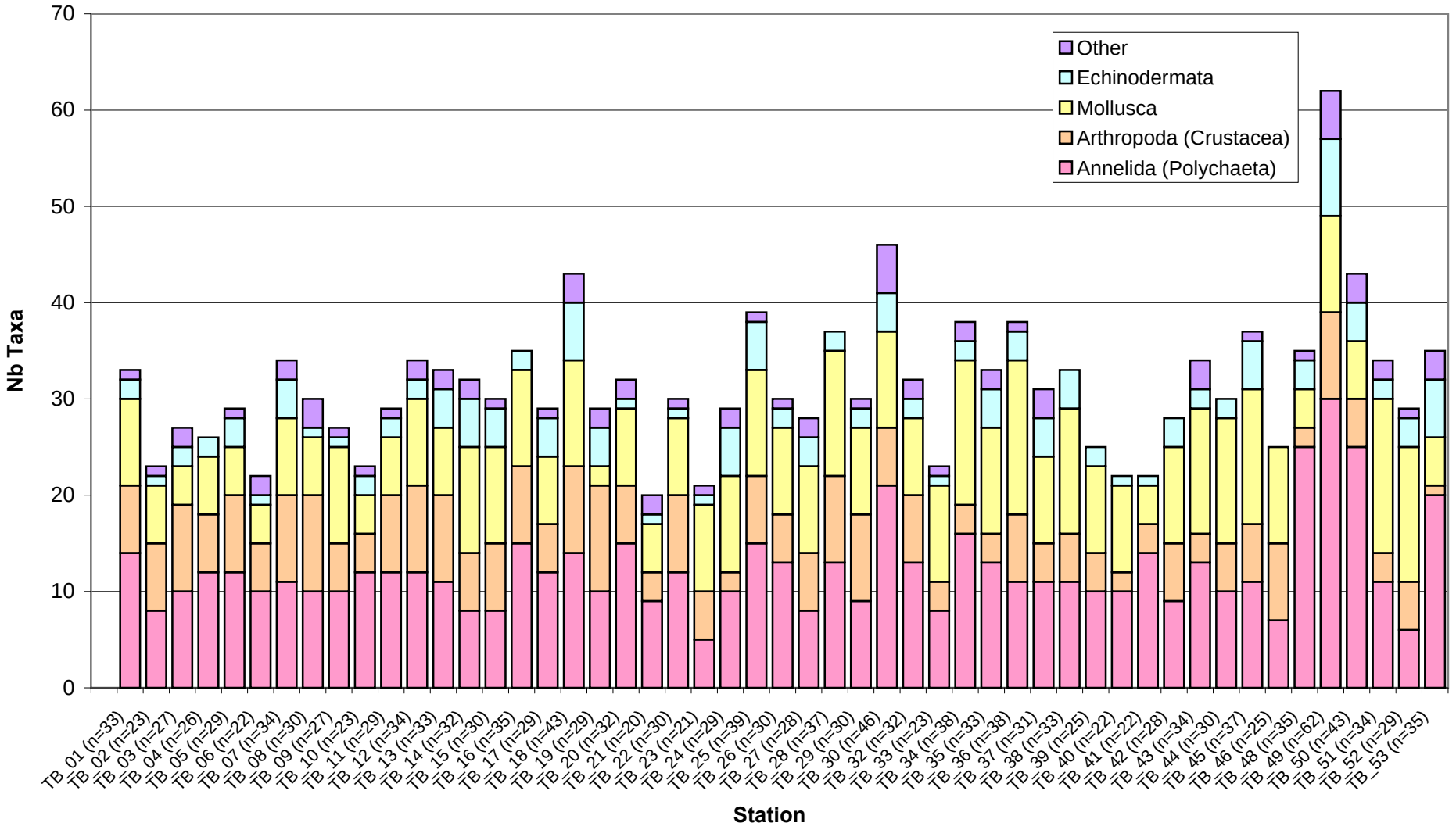
Figure E.1 Tranche B Proportional Individual Contribution of Gross Taxonomic Groups



APPENDIX E - MACROFAUNAL ANALYSIS

Tranche B

Figure E.2 **Tranche B Proportional Taxa Contribution of Gross Taxonomic Groups**



APPENDIX E - MACROFAUNAL ANALYSIS

Tranche B

Table E.2 Tranche B Benthic Biomass (g Ash-Free Dry Weight)

Station	Annelida (g)	Crustacea (g)	Mollusca (g)	Echinodermata (g)	Miscellania (g)	Total (g)
TB_01	0.1003	0.0191	0.1759	2.6421	0.0070	2.9444
TB_02	0.0482	0.0093	0.0106	7.9892	0.0012	8.0586
TB_03	0.0297	0.0161	0.0041	0.0243	0.2156	0.2899
TB_04	0.1479	0.0198	0.0277	0.0820	0.0056	0.2829
TB_05	0.0385	0.0041	0.1046	0.0024	0.0026	0.1522
TB_06	0.0675	0.0119	0.0080	0.0007	0.0020	0.0901
TB_07	0.1171	0.0043	0.1792	1.0675	0.0013	1.3694
TB_08	0.0658	0.0196	0.0303	0.0012	0.0025	0.1195
TB_09	0.0474	0.0015	0.1334	0.2359	0.0003	0.4185
TB_10	0.0239	0.0026	0.0525	0.0004	0.0000	0.0794
TB_11	0.0930	0.0135	0.0577	2.2353	0.0016	2.4012
TB_12	0.0818	0.0144	0.0447	0.0345	0.0308	0.2062
TB_13	0.0581	0.0162	0.0150	0.5083	0.0030	0.6005
TB_14	0.0451	0.0048	0.3233	0.9584	0.0066	1.3382
TB_15	0.0645	0.0034	0.0697	0.3908	0.0090	0.5374
TB_16	0.1213	0.0041	0.0505	0.5487	0.0008	0.7254
TB_17	0.1579	0.0053	0.0423	0.2925	0.0018	0.4997
TB_18	0.0967	0.0047	0.0904	1.9081	0.0839	2.1839
TB_19	0.0696	0.0049	0.4103	0.0120	0.0086	0.5054
TB_20	0.0604	0.0014	0.8324	0.1485	0.0036	1.0463
TB_21	0.0380	0.0113	0.9578	0.0005	0.0006	1.0082
TB_22	0.0826	0.0068	0.0480	1.5960	-	1.7334
TB_23	0.0719	0.0079	0.1714	0.4474	0.0026	0.7012
TB_24	0.1170	0.0007	0.2287	0.8420	0.0186	1.2070
TB_25	0.0385	0.0069	0.3831	0.0179	0.0038	0.4503
TB_26	0.1232	0.0020	0.1460	3.1430	0.0025	3.4167
TB_27	0.1119	0.0075	0.0186	1.6086	0.0002	1.7468
TB_28	0.0412	0.0533	0.3913	0.0124	-	0.4981
TB_29	0.0797	0.0116	0.0522	0.0130	-	0.1565

APPENDIX E - MACROFAUNAL ANALYSIS

Tranche B

Table E.2 Tranche B Benthic Biomass (g Ash-Free Dry Weight)

Station	Annelida (g)	Crustacea (g)	Mollusca (g)	Echinodermata (g)	Miscellania (g)	Total (g)
TB_30	0.1619	0.0019	1.6592	0.0018	0.0147	1.8394
TB_32	0.1080	0.0079	0.0559	0.1531	0.0027	0.3275
TB_33	0.0221	0.0129	0.2699	0.0005	0.0010	0.3064
TB_34	0.0761	0.0030	0.2850	0.3333	0.0024	0.6999
TB_35	0.1430	0.0050	0.0481	0.0262	0.0963	0.3186
TB_36	0.0735	0.0088	0.0879	0.0391	0.0017	0.2110
TB_37	0.0380	0.0012	0.4585	0.3288	0.0032	0.8298
TB_38	0.1039	0.0022	0.4040	0.0017	0.0001	0.5118
TB_39	0.1270	0.0029	0.0172	0.0035	-	0.1506
TB_40	0.0421	0.0026	0.0227	0.0010	-	0.0685
TB_41	0.0696	0.0058	0.0081	0.0003	-	0.0838
TB_42	0.0281	0.0086	0.1748	0.0065	-	0.2179
TB_43	0.1303	0.0058	0.0788	0.0020	0.0120	0.2290
TB_44	0.0416	0.0064	0.0503	0.0031	-	0.1013
TB_45	0.0332	0.0139	0.0297	0.2785	0.0006	0.3559
TB_46	0.0768	0.0064	0.0324	0.6974	0.0016	0.8146
TB_48	0.1299	0.0024	0.0031	0.0151	0.0188	0.1692
TB_49	0.0911	0.0321	0.0313	0.6023	6.1971	6.9540
TB_50	0.0503	0.0007	0.0569	0.1710	0.0087	0.2877
TB_51	0.0931	0.0155	0.0024	0.0017	0.0023	0.1150
TB_52	0.0813	0.0022	0.0374	0.0034	0.0008	0.1251
TB_53	0.0485	0.0001	0.0032	0.6919	0.2594	1.0030

APPENDIX E – MACROFAUNAL ANALYSIS

Tranche B

Table E.3 Tranche B Univariate Statistics Results

Station	Taxa	Individuals	Pielou's Evenness (J)	Shannon Wiener Diversity (H')	Simpson's Dominance (λ)
TB_01	33	226	0.63	3.16	0.27
TB_02	23	149	0.53	2.40	0.40
TB_03	27	97	0.82	3.88	0.11
TB_04	26	150	0.58	2.75	0.34
TB_05	29	148	0.63	3.04	0.30
TB_06	22	101	0.62	2.77	0.32
TB_07	34	139	0.62	3.18	0.31
TB_08	30	224	0.60	2.92	0.32
TB_09	27	67	0.86	4.10	0.09
TB_10	23	70	0.77	3.50	0.15
TB_11	29	227	0.57	2.79	0.31
TB_12	34	122	0.81	4.14	0.10
TB_13	33	216	0.68	3.44	0.23
TB_14	32	130	0.72	3.58	0.20
TB_15	30	80	0.90	4.42	0.06
TB_16	35	212	0.58	2.96	0.33
TB_17	29	206	0.61	2.98	0.26
TB_18	43	297	0.56	3.03	0.35
TB_19	29	131	0.64	3.11	0.27
TB_20	32	116	0.76	3.79	0.15
TB_21	20	64	0.80	3.45	0.17
TB_22	30	219	0.58	2.85	0.33
TB_23	21	123	0.61	2.70	0.31
TB_24	29	150	0.65	3.15	0.26
TB_25	39	178	0.67	3.52	0.23
TB_26	30	136	0.78	3.83	0.12
TB_27	28	164	0.57	2.72	0.36
TB_28	37	150	0.75	3.90	0.17
TB_29	30	154	0.69	3.41	0.22
TB_30	46	316	0.61	3.36	0.26
TB_32	32	158	0.58	2.90	0.33
TB_33	23	104	0.69	3.11	0.26
TB_34	38	154	0.78	4.08	0.10
TB_35	33	158	0.77	3.88	0.12
TB_36	38	130	0.79	4.13	0.12
TB_37	31	130	0.68	3.38	0.23
TB_38	33	166	0.73	3.67	0.17
TB_39	25	99	0.71	3.29	0.23
TB_40	22	90	0.84	3.72	0.11
TB_41	22	127	0.59	2.62	0.36
TB_42	28	122	0.70	3.35	0.18
TB_43	34	144	0.82	4.20	0.08
TB_44	30	151	0.74	3.61	0.14
TB_45	37	196	0.74	3.83	0.14
TB_46	25	92	0.78	3.60	0.17
TB_48	35	103	0.86	4.42	0.07
TB_49	62	413	0.74	4.43	0.09
TB_50	43	146	0.83	4.49	0.08
TB_51	34	156	0.73	3.72	0.14
TB_52	29	151	0.75	3.64	0.14
TB_53	35	150	0.79	4.03	0.10
Min	**20**	**64**	**0.53**	**2.40**	**0.06**
Max	**62**	**413**	**0.90**	**4.49**	**0.40**
Mean	**31**	**155**	**0.70**	**3.47**	**0.21**
SD	**7**	**64**	**0.10**	**0.54**	**0.10**

APPENDIX E – MACROFAUNAL ANALYSIS

Teesside Cable Corridor

Table E.4 **Teesside Cable Corridor Macrofauna Taxa List - Stations TCC_01 to TCC_61**

Phylum Class/Order	Taxon	STATIONS																																											
		TCC_01	TCC_03	TCC_05	TCC_06	TCC_09	TCC_10	TCC_12	TCC_14	TCC_16	TCC_18	TCC_22	TCC_24	TCC_25	TCC_26	TCC_27	TCC_29	TCC_31	TCC_32	TCC_35	TCC_37	TCC_39	TCC_40	TCC_42	TCC_43	TCC_45	TCC_46	TCC_47	TCC_48	TCC_49	TCC_52	TCC_53	TCC_54	TCC_55	TCC_56	TCC_57	TCC_61
Taxa included in Statistical Analysis																																													
Annelida - Polychaeta	Aphroditidae (juv)																													1																
	Aphrodita aculeata																																												
	Polynoidae (juv)								1				1															1																
	Enipo kinbergi																																												
	Gattyana cirrhosa																				1							1																
	Harmothoe antilopes																																												
	Harmothoe imbricata										1																																		
	Harmothoe mariannae																																												
	Malmgreniella castanea										1																																		
	Malmgreniella darbouxi																												1																
	Harmothoe glabra																					1																						
	Lepidonotus squamatus																																												
	Pholoe baltica (sensu Petersen)							1														1			1		1				1	2			5								
	Pholoe inornata (sensu Petersen)								1																								1											
	Sigalionidae																																												
	Sigalion mathildae																																												
	Sigalion squamosus																																												
	Sthenelais																															1												
	Sthenelais limicola											1					1		1							2		2			1	1	1	3									
	Eteone longa																						1												9								
	Phyllodoce																					1																						
	Phyllodoce groenlandica												1								1	1				1	4	3							1								
	Phyllodoce rosea																																												
	Eulalia																																												
	Eulalia bilineata																													1														
	Eumida										2																																		
	Eumida (juv)								1																																			
	Eumida bahusiensis																																												
	Eumida sanguinea																																												
	Glycera (juv)																										2					1			3								
	Glycera alba								1	1																																		
	Glycera lapidum								4																1																			
	Glycera unicornis						1	1	2	1													1		1		3	1	2	1														
	Goniadidae (juv)								1				1															1				1			1								
	Glycinde nordmanni							1																1					1					1	1	1						
	Goniada maculata	1					1	1	1	1	1		1	3	1	1	2		1	1	3		1	3	1	2	1	4	1		1	4	4	1	5	2						
	Oxydromus flexuosus							1																				1	1														
	Podarkeopsis capensis				1																											1			3							
	Glyphohesione klatti									1														1																			
	Exogone (Parexogone) hebes										1																																	
	Exogone (Exogone) naidina																					1																						
	Exogone (Exogone) verugera								2												1																						
	Sphaerosyllis taylori																																												
	Proceraea																					1																						

APPENDIX E – MACROFAUNAL ANALYSIS

Teesside Cable Corridor

Phylum Class/Order	Taxon	STATIONS																																							
		TCC_01	TCC_03	TCC_05	TCC_06	TCC_09	TCC_10	TCC_12	TCC_14	TCC_16	TCC_18	TCC_22	TCC_24	TCC_25	TCC_26	TCC_27	TCC_29	TCC_31	TCC_32	TCC_35	TCC_37	TCC_39	TCC_40	TCC_42	TCC_43	TCC_45	TCC_46	TCC_47	TCC_48	TCC_49	TCC_52	TCC_53	TCC_54	TCC_55	TCC_56	TCC_57	TCC_61
	Nereididae (juv)								1																																
	Eunereis longissima						1			1																															
	Aglaophamus agilis																																							
	Nephtys (juv)	4	2					2																						1		1	2		4	3	2
	Nephtys assimilis												1			1														2							1
	Nephtys caeca																1																				
	Nephtys cirrosa		3																																6	
	Nephtys hombergii	1			1	1				1																		1			2	1		1		
	Nephtys kersivalensis			1																1						1				2						
	Nephtys longosetosa																	1																			
	Paramphinome jeffreysii								3	1	15	2	1		3	1	5	3	2	14	22	7	12	53	16	3	35	21	5	5	5	9			7		
	Lumbrineris cingulata					3	2	3	17	6							2																				
	Arabella iricolor																																							
	Orbinia latreillii																																							
	Scoloplos (Scoloplos) armiger					1					6	7	7	1	1	1	5	1	1	7	1	2	2	2							4	7	2				
	Aricidea (Acmira) catherinae																																							
	Aricidea simonae																																							
	Levinsenia gracilis							1	6	1		1									3						1	1										
	Paradoneis lyra							1														1																
	Apistobranchus tullbergi								1														1								1							
	Poecilochaetus serpens										2																							2	1			
	Aonides paucibranchiata										1	1							1	3	1	1				1												
	Laonice																																							
	Laonice bahusiensis						1	1															1		1													
	Laonice sarsi																					1			1													
	Minuspio cirrifera									2							1		1	2																		
	Dipolydora caeca																							1														
	Dipolydora caulleryi																																							
	Pseudopolydora paucibranchiata																								1													
	Scolelepis			1																					1	1												
	Scolelepis bonnieri	2																																						
	Scolelepis (Scolelepis) foliosa												1																									
	Scolelepis korsuni							1																				1								1	
	Spio goniocephala																														1								
	Spiophanes bombyx										3	1	23	1		2					1	1		8	5	9	1	3	1	2	9	21	25	1	139	15	
	Spiophanes kroyeri										2					3					2	2	1	3	2	2	2	3		2			3	1			
	Magelona alleni																			2							1										
	Magelona filiformis		2	30							1					1	1												1	1	1	1	3	2	1			
	Magelona johnstoni	4	8	37																																1	23
	Chaetopterus variopedatus																										1										
	Aphelochaeta (Type A)								1																												
	Chaetozone christiei			1							2		1																			3			1		2
	Chaetozone setosa						1	4	3		1	2				2	3		1	5		6	1			2		2	1	1	2		1	2	1		
	Caulleriella zetlandica									1	1																										
	Cirratulus caudatus														2													2									
	Cauleriella killariensis															1		1		2																	

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Teesside Cable Corridor

Phylum Class/Order	Taxon	STATIONS																																								
		TCC_01	TCC_03	TCC_05	TCC_06	TCC_09	TCC_10	TCC_12	TCC_14	TCC_16	TCC_18	TCC_22	TCC_24	TCC_25	TCC_26	TCC_27	TCC_29	TCC_31	TCC_32	TCC_35	TCC_37	TCC_39	TCC_40	TCC_42	TCC_43	TCC_45	TCC_46	TCC_47	TCC_48	TCC_49	TCC_52	TCC_53	TCC_54	TCC_55	TCC_56	TCC_57	TCC_61
	Diplocirrus glaucus				1	2	2		1				2				2			2		1			1		1		6	3	3	1	6		2		
	Pherusa plumosa																																									
	Heteromastus filiformis																					1		2	3		4		1														
	Mediomastus fragilis												1																1														
	Notomastus latericeus																					1			1	1	8		1	1			1									
	Peresiella clymenoides							7	2	2																																
	Maldanidae																			1							2															
	Clymenura																																									
	Euclymene (Type A)																							1																		
	Praxillella affinis																		1	2		1	16	13	11		1		3	1												
	Rhodine						1		1																																	
	Rhodine gracilior							5																																		
	Ophelia (juv)																										1															
	Ophelia borealis																																									
	Ophelina acuminata									1	1																															
	Polyphysia crassa																												1													
	Scalibregma inflatum																																		1							
	Galathowenia oculata										2					1	12	3	22	1	15	4	9	12	3	3	6	17	18	3						2						
	Myriochele danielsseni										1							1	3	2	6			3	1	1		3			1											
	Owenia fusiformis						1				1			1	2		3		3	7	5	3	13	6	7	3	3	3	5	1												
	Pectinariidae (juv)																					4																			
	Amphictene auricoma												10									1	1		1			1		1		9	7							
	Lagis koreni					2	2		1		1							1		1	1										1	3	1	4	45					
	Ampharetidae								1	2								1				2			2			1	1												
	Ampharete falcata							1				1						1		10	7	13	5	2	8	2		12	1	12	1										
	Ampharete finmarchica									2													1																		
	Ampharete lindstroemi									5	1		2										1	4		1	13	4			1				1					
	Amphicteis gunneri																										1														
	Anobothrus gracilis										1										1																				
	Terebellides stroemii								3	2										1																				
	Trichobranchus roseus						1	1	4								1	3		1		2				1		5		1	1									
	Terebellidae (juv)								1																																
	Eupolymnia nesidensis																																								
	Lanice conchilega												1																				1							
	Phisidia aurea																																								
	Pista cristata																																								
	Polycirrus										1																														
	Streblosoma bairdi																												1												
	Streblosoma intestinale																							1	1		1														
	Thelepus cincinnatus																					1																			
	Thelepus setosus																											1		1											
	Sabellidae									1																															
	Sabellidae (juv)																	1										1													
	Chone dunerificta																																								
	Euchone rubrocincta									1																															
	Serpulidae							1		7																															

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Teesside Cable Corridor

Phylum Class/Order	Taxon	STATIONS																																						
		TCC_01	TCC_03	TCC_05	TCC_06	TCC_09	TCC_10	TCC_12	TCC_14	TCC_16	TCC_18	TCC_22	TCC_24	TCC_25	TCC_26	TCC_27	TCC_29	TCC_31	TCC_32	TCC_35	TCC_37	TCC_39	TCC_40	TCC_42	TCC_43	TCC_45	TCC_46	TCC_47	TCC_48	TCC_49	TCC_52	TCC_53	TCC_54	TCC_55	TCC_56	TCC_57	TCC_61
	Hydroides norvegicus							4	2	20	4																							1		
	Spirobranchus																																			
	Spirobranchus lamarcki																																			
	Spirobranchus triqueter									1																										
Arthropoda - Crustacea	*Sarsinebalia urgorrii*																																			
	Schistomysis ornata																																			
	Apherusa bispinosa																			1																
	Eusirus longipes																																			
	Perioculodes longimanus																																			
	Pontocrates altamarinus																																			
	Synchelidium maculatum																																			
	Westwoodilla caecula												1							1										1						
	Parapleustes assimilis																					1														
	Stenopleustes nodifera																					1														
	Leucothoe incisa																																			1
	Leucothoe lilljeborgi																													1						
	Urothoe elegans											2																								
	Harpinia antennaria							1	1		4	1	6	2		1	1	2	3	3	3	5	5		1				1	1	2		5	1		1	
	Harpinia pectinata																																			
	Hippomedon denticulatus														1			1		1								3		1							1
	Lepidepecreum longicornis																																			
	Scopelocheirus hopei																																			
	Tmetonyx cicada																							2				1	1							
	Nototropis falcatus																																			
	Atylus vedlomensis								2	1																				1					1	
	Ampelisca												1													1				1					1	
	Ampelisca brevicornis				1																1							1		1				3	1	
	Ampelisca diadema								1				2																				1			
	Ampelisca macrocephala						1									1								2												
	Ampelisca spinipes									2		1												1		1							1			
	Ampelisca tenuicornis									1						1				1		1			3		1	3		1		1			4		
	Bathyporeia	2																														1				
	Bathyporeia elegans		5																																1	3
	Bathyporeia gracilis			1																												1				
	Bathyporeia guilliamsoniana	28	6			1																														1
	Bathyporeia tenuipes																																			
	Melitidae																																			
	Cheirocratus sundevallii								1																											
	Othomaera othonis							1																												
	Maerella tenuimana								1																											
	Gammaropsis maculata									1																										
	Photis longicaudata																			2																
	Aoridae (female)																		1			1						1								
	Aoridae (juv)																				1															
	Autonoe longipes																				1															
	Corophiidae		2																																	

APPENDIX E – MACROFAUNAL ANALYSIS

Teesside Cable Corridor

Phylum Class/Order	Taxon	STATIONS																																							
		TCC_01	TCC_03	TCC_05	TCC_06	TCC_09	TCC_10	TCC_12	TCC_14	TCC_16	TCC_18	TCC_22	TCC_24	TCC_25	TCC_26	TCC_27	TCC_29	TCC_31	TCC_32	TCC_35	TCC_37	TCC_39	TCC_40	TCC_42	TCC_43	TCC_45	TCC_46	TCC_47	TCC_48	TCC_49	TCC_52	TCC_53	TCC_54	TCC_55	TCC_56	TCC_57	TCC_61
	Dyopedos monacantha																				1																						
	Caprella linearis																					4																					
	Pariambus typicus																													1	1											
	Phtisica marina																					3			1																		
	Hyperiidae																																		1							
	Gnathiidae (juv)																																									
	Gnathia oxyuraea																																									
	Astacilla dilatata																			1																						
	Araphura brevimana																																1									
	Akanthophoreus gracilis							1																																		
	Bodotria scorpioides																																									
	Eudorella emarginata																							1									1		1							
	Eudorellopsis deformis								1			1																				1										
	Diastylis								1																							1										
	Diastylis bradyi										1																	1			1										3
	Diastylis laevis																			1																						
	Diastylis rugosa																																									
	DECAPODA (juv)										1																															
	Pandalina brevirostris																																									
	Crangonidae																																									
	Philocheras bispinosus bispinosus				1																				1																	
	Philocheras trispinosus																																1									
	Crangon allmanni														1					1																						
	Callianassa (juv)																						1				1															
	Callianassa subterranea																1																									
	Paguridae (juv)							1	1		1																															
	Anapagurus									1																																
	Anapagurus hyndmanni							1																																		
	Pagurus bernhardus										1																															
	Galathea																																									
	Galathea (juv)									1																																
	Galathea intermedia					1																																				
	Pisidia longicornis																																									
	Ebalia (juv)																															1										
	Ebalia tuberosa									1																																
	Hyas (juv)																					1																					
	Hyas coarctatus																																									
	Inachus dorsettensis									1																																

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Teesside Cable Corridor

Phylum Class/Order	Taxon	STATIONS																																							
		TCC_01	TCC_03	TCC_05	TCC_06	TCC_09	TCC_10	TCC_12	TCC_14	TCC_16	TCC_18	TCC_22	TCC_24	TCC_25	TCC_26	TCC_27	TCC_29	TCC_31	TCC_32	TCC_35	TCC_37	TCC_39	TCC_40	TCC_42	TCC_43	TCC_45	TCC_46	TCC_47	TCC_48	TCC_49	TCC_52	TCC_53	TCC_54	TCC_55	TCC_56	TCC_57	TCC_61
	Corystes cassivelaunus																																									
	Liocarcinus (juv)																																									
	Liocarcinus holsatus																																									
Mollusca - Caudofoveata	*Chaetoderma nitidulum*					2	2										1					1		3		1	1	1	1		1											
Polyplacophora	POLYPLACOPHORA (juv)																																									
	Leptochiton asellus																																									
Gastropoda	*Polinices* (juv)																																									
	Euspira pulchella														1																				1							
	Epitonium trevelyanum													1																												
	Vitreolina philippi																					2	1					1														
	Buccinum undatum																																									
	Raphitoma linearis																						1																			
	CEPHALASPIDEA																																									
	Acteon tornatilis																													1			3		1							
	Philine									1	2							2	1	3	1	4	2		1		1	1		3	1	3		3	3							
	Cylichna cylindracea					2	3		1			2	8				3	1	1										1	2	1	1	3		5						
	Roxania utriculus																					1								1												
	Goniodoris nodosa																																									
	Onchidorididae																																									
	Dendronotus frondosus																					1																				
	Facelina																																									
Scaphopoda	*Antalis entalis*							1				1	2									1	1	1				4		1	1		1								
Bivalvia	*Nucula hanleyi*																																									
	Nucula nitidosa			4	26								17																			1	8	2	4							
	Nucula nucleus																																									
	Ennucula tenuis				2				1	1	8	5		1	3			4	1	1		1	1		1		1		1													
	Pectinidae (juv)																																									
	Anomiidae (juv)																																									
	Lucinoma borealis							1	1			1							1	2			1	1	1					1	4	1	4	3	2						
	Thyasira																										1		2			1									
	Thyasira flexuosa				1	2		4	2	1			4	1			2	1				1		4				2	1		1	5	9	7	1						
	Thyasira equalis																						1		7		3		1			1									
	Thyasira biplicata						4																		5				3													
	Montacuta substriata																																									
	Kurtiella bidentata		1			8	4				1	3																							1						
	Tellimya ferruginosa			4	3	1													1						1											2	2				
	Astartidae (juv)																																									
	Astarte montagui																																									
	Cardiidae (juv)									1			1					1				1				1		1		1												
	Parvicardium pinnulatum																																									
	Mactridae (juv)	1	2	1	2																		1												1						
	Mactra stultorum																																									1
	Spisula elliptica																																									
	Ensis																																									

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Phylum Class/Order	Taxon	STATIONS																																							
		TCC_01	TCC_03	TCC_05	TCC_06	TCC_09	TCC_10	TCC_12	TCC_14	TCC_16	TCC_18	TCC_22	TCC_24	TCC_25	TCC_26	TCC_27	TCC_29	TCC_31	TCC_32	TCC_35	TCC_37	TCC_39	TCC_40	TCC_42	TCC_43	TCC_45	TCC_46	TCC_47	TCC_48	TCC_49	TCC_52	TCC_53	TCC_54	TCC_55	TCC_56	TCC_57	TCC_61
	Phaxas pellucidus		1	1	2		3	2			1		3		1				1	1	1				1	2		4	2	1		1	1		3		
	Angulus fabula		1	8																														3		6
	Gari (juv)																																							
	Gari fervensis																																							
	Gari costulata										1																													
	Abra																																							
	Abra (juv)																														2				1					
	Abra nitida						1				1													1				2			1									
	Abra prismatica	2		2	2	1							11																	1	1		5	5	2					
	Arctica islandica (juv)						1					2							1									2												
	Dosinia (juv)																																		2	1				
	Dosinia lupinus										1	1																				1								
	Chamelea striatula		1	4	8	4	2						3			1			1			1	1					1		2		1	1		1					
	Clausinella fasciata																																							
	Timoclea ovata												1															1			1				1					
	Mysia undata																					1																		
	Corbula gibba																													1										
	Hiatella arctica										1							2					1	1																	
	Thracia																																							
	Thracia (juv)			1																																				
	Thracia phaseolina					1																							1					1					
	Cochlodesma praetenue											1			1																				1					
	Lyonsia norwegica																																							
	Cuspidariidae																																1						
	Cuspidariidae (juv)																																							
Echinodermata - Asteroidea	ASTEROIDEA (juv)									1			2										2							2		4	3	1		2				
	Luidia sarsii														1																									
	Astropecten irregularis																1																							
Ophiuroidea	OPHIUROIDEA (juv)			2	5	15	2	1	4	2	7	9	17	3	2	4	1	1	4	4	5	10	5	3	7	3	2	6	6	5	3	9	10	3	14		1		
	Acrocnida brachiata																																							
	Amphiura																				1						2						1							
	Amphiura filiformis				1	39	4		1			5	6	1		1		3		1		2	3	6	2	2		3	2		1	3							
	Ophiuridae (juv)							1	2	4										2								3											
	Ophiura albida								1	1																													
	Ophiocten affinis									1		1									1																		
Echinoidea	ECHINOIDEA (juv)		3	P	1			1	3	1	2	2	2	1	1	1	14	8	9	30	16	31	22		1	1				1			2	6		1	1		
	Echinocyamus pusillus							4	2	12	1		1																						7					
	Spatangus purpureus											1																												
	Echinocardium																																							
	Echinocardium cordatum	1			1	3											1																						
	Echinocardium flavescens											2																												
Holothuroidea	Cucumariidae																																							
	Pseudothyone raphanus								2	1							1	1		2	8	3		1		3	2	5		2	1								
	Leptopentacta elongata					1																																		
	Leptosynapta																																							
	Leptosynapta inhaerens																								1															

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Phylum Class/Order	Taxon	STATIONS																																			
		TCC_01	TCC_03	TCC_05	TCC_06	TCC_09	TCC_10	TCC_12	TCC_14	TCC_16	TCC_18	TCC_22	TCC_24	TCC_25	TCC_26	TCC_27	TCC_29	TCC_31	TCC_32	TCC_35	TCC_37	TCC_39	TCC_40	TCC_42	TCC_43	TCC_45	TCC_46	TCC_47	TCC_48	TCC_49	TCC_52	TCC_53	TCC_54	TCC_55	TCC_56	TCC_57	TCC_61
	Labidoplax buskii									1							2		2	1	4	1	3	2	1	2		3	1		1						
Foraminifera	*Astrorhiza*						1					5	8	4	4		6	1	4	2		3						8	3		2						
Cnidaria	*Virgularia mirabilis*							1	4			3	1	1																							
	Pennatula phosphorea																	1				1		1				1		1							
	Cerianthus lloydii								1	5	1	1	1				1			1	1	2	4												3		
	ACTINIARIA								2															1	1			1									
	Adamsia palliata																																				
	Edwardsiidae						6	3	1	4															1								1		1		
Platyhelminthes	Turbellaria									1																		1									
	NEMERTEA			3		1	1		10	1	3			1			1		1	2		1	5	3	3	2	1	2	4	3		1	1		6		
Sipuncula	Golfingiidae (juv)								1															1			1										
	Golfingia					1																															
	Golfingia (Golfingia) elongata																										1										
	Phascolion (Phascolion) strombus strombus																			1																	
Pycnogonida	*Nymphon brevirostre*										1																										
	Achelia simplex									1																											
	Anoplodactylus petiolatus										1																										
Phoronida	*Phoronis*			2	1		45	2	5	1	2		2	4	6		1		3	3	1	1	6	2		2				1	6		5	1	4		
Hemichordata	ENTEROPNEUSTA																			1																	
	Individuals	**46**	**37**	**103**	**60**	**92**	**94**	**63**	**115**	**111**	**95**	**66**	**154**	**26**	**31**	**24**	**76**	**46**	**72**	**134**	**117**	**148**	**134**	**153**	**109**	**57**	**112**	**159**	**84**	**77**	**68**	**109**	**129**	**49**	**312**	**41**	**48**
	Taxa	**10**	**13**	**17**	**18**	**21**	**26**	**34**	**51**	**49**	**45**	**29**	**37**	**15**	**16**	**17**	**28**	**25**	**27**	**44**	**31**	**55**	**36**	**36**	**40**	**29**	**36**	**53**	**36**	**44**	**36**	**38**	**39**	**19**	**50**	**16**	**14**

Juveniles (green shading)

Phylum Class/Order	Taxon	STATIONS																																			
		TCC_01	TCC_03	TCC_05	TCC_06	TCC_09	TCC_10	TCC_12	TCC_14	TCC_16	TCC_18	TCC_22	TCC_24	TCC_25	TCC_26	TCC_27	TCC_29	TCC_31	TCC_32	TCC_35	TCC_37	TCC_39	TCC_40	TCC_42	TCC_43	TCC_45	TCC_46	TCC_47	TCC_48	TCC_49	TCC_52	TCC_53	TCC_54	TCC_55	TCC_56	TCC_57	TCC_61
Taxa excluded in Statistical Analysis																																					
Cnidaria	FILIFERA																																				
	Bougainvilliidae													P																							
	Lovenella clausa																																		P		
	Halecium																																				
	Abietinaria abietina																																				
	Sertularella																																				
	Sertularia																																				
	Sertularia distans																																				
	Plumulariidae																					P	P														
	Campanulariidae																																				
	Clytia hemisphaerica																																				
	Alcyonium digitatum																																				
Nematoda	NEMATODA									3				1									1		9	2		29								2	

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Phylum Class/Order	Taxon	STATIONS																																					
		TCC_01	TCC_03	TCC_05	TCC_06	TCC_09	TCC_10	TCC_12	TCC_14	TCC_16	TCC_18	TCC_22	TCC_24	TCC_25	TCC_26	TCC_27	TCC_29	TCC_31	TCC_32	TCC_35	TCC_37	TCC_39	TCC_40	TCC_42	TCC_43	TCC_45	TCC_46	TCC_47	TCC_48	TCC_49	TCC_52	TCC_53	TCC_54	TCC_55	TCC_56	TCC_57	TCC_61
Bryozoa	*Crisia*										P																												
	Tubulipora										P																												
	Alcyonidium diaphanum											P																											
	Alcyonidium parasiticum									P				P																									
	Eucratea loricata											P		P																									
	Electra pilosa									P																													
	Flustra foliacea																																						
	Callopora dumerilii																																						
	Amphiblestrum auritum										P																												
	Bugula									P																													
	Bugula avicularia																						P																
	Bugula purpurotincta																					P																	
	Scrupocellaria scabra																																						
	Palmiskenea skenei																																						

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Teesside Cable Corridor

Table E.5 **Teesside Cable Corridor Macrofauna Taxa List - Stations TCC_62 to TCC_120**

Phylum Class/Order	Taxon	STATIONS																																			Total
		TCC_62	TCC_64	TCC_71	TCC_75	TCC_76	TCC_78	TCC_79	TCC_80	TCC_82	TCC_84	TCC_85	TCC_86	TCC_87	TCC_90	TCC_92	TCC_93	TCC_94	TCC_95	TCC_97	TCC_99	TCC_100	TCC_101	TCC_102	TCC_103	TCC_106	TCC_107	TCC_109	TCC_111	TCC_112	TCC_113	TCC_114	TCC_115	TCC_116	TCC_118	TCC_120	
Taxa included in Statistical Analysis																																					
ANNELIDA - Polychaeta	Aphroditidae (juv)			1																							1									**3**
	Aphrodita aculeata																																	1			**1**
	Polynoidae (juv)				3																													1			**7**
	Enipo kinbergi																				1																**1**
	Gattyana cirrhosa																																				**2**
	Harmothoe antilopes																																	1			**1**
	Harmothoe imbricata																																				**1**
	Harmothoe mariannae				1																																**1**
	Malmgreniella castanea																																				**1**
	Malmgreniella darbouxi																		1																		**2**
	Harmothoe glabra																																				**1**
	Lepidonotus squamatus				1	1																															**2**
	Pholoe baltica (sensu Petersen)			1		1																						2				10	2	16		**44**
	Pholoe inornata (sensu Petersen)																																				**2**
	Sigalionidae			1																																	**1**
	Sigalion mathildae	2																													1			1			**4**
	Sigalion squamosus		2																																		**2**
	Sthenelais																											2									**3**
	Sthenelais limicola										2		1	1	2			1	3			3	3	1	3	1		1			3	3			2		**43**
	Eteone longa												1																				2	3	1	**17**
	Phyllodoce																																				**1**
	Phyllodoce groenlandica			1																	1	1							1								**16**
	Phyllodoce rosea																																	2			**2**
	Eulalia			1																																	**1**
	Eulalia bilineata																																				**1**
	Eumida				3																																**5**
	Eumida (juv)																																				**1**
	Eumida bahusiensis																																1				**1**
	Eumida sanguinea						1																														**1**
	Glycera (juv)					1		6		1															1												**15**
	Glycera alba					1															1											3					**7**
	Glycera lapidum			4	4	3	2		1	3																											**22**
	Glycera unicornis																																				**14**
	Goniadidae (juv)																		1				1							1			2	1	2		**13**
	Glycinde nordmanni		2	1		1			1							1			1														1		2	1	**17**
	Goniada maculata						1	1	1	1			1	1	1	2	1	1		1			1		2	1			3		1	2	1	1	5		**78**
	Oxydromus flexuosus															1									1												**5**
	Podarkeopsis capensis																																		1		**6**
	Glyphohesione klatti			1					1	1																											**5**
	Exogone (Parexogone) hebes																																				**1**
	Exogone (Exogone) naidina																																				**1**
	Exogone (Exogone) verugera			2				1																											1		**7**
	Sphaerosyllis taylori			2																																	**2**
	Proceraea				1																																**2**

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Teesside Cable Corridor

Phylum Class/Order	Taxon	STATIONS																																			Total
		TCC_62	TCC_64	TCC_71	TCC_75	TCC_76	TCC_78	TCC_79	TCC_80	TCC_82	TCC_84	TCC_85	TCC_86	TCC_87	TCC_90	TCC_92	TCC_93	TCC_94	TCC_95	TCC_97	TCC_99	TCC_100	TCC_101	TCC_102	TCC_103	TCC_106	TCC_107	TCC_109	TCC_111	TCC_112	TCC_113	TCC_114	TCC_115	TCC_116	TCC_118	TCC_120	
	Nereididae (juv)																								1		1										3
	Eunereis longissima																															1					3
	Aglaophamus agilis						1																														1
	Nephtys (juv)	2	2											1						1	1	1										1	2	1	3		36
	Nephtys assimilis	1																	1				1							1				1	2	12
	Nephtys caeca														2			1	2					1										1			8
	Nephtys cirrosa															2																					11
	Nephtys hombergii	1											1																1		1	2					15
	Nephtys kersivalensis																																	1			6
	Nephtys longosetosa																																				1
	Paramphinome jeffreysii					1			4	4	1	2	1	7	1	2	2		4	2	3	4	1	3	14	9	16	8	2								341
	Lumbrineris cingulata			25	8	5																															71
	Arabella iricolor			1																																	1
	Orbinia latreillii	1																																			1
	Scoloplos (Scoloplos) armiger									3	6	4	7	9			3	4	7	4	7	4	1	10	12		1	1	4	6	2		3	6	2		164
	Aricidea (Acmira) catherinae							2		1								1			4																8
	Aricidea simonae						6	1		1										1																		9
	Levinsenia gracilis			1					1	1							1							1			2										21
	Paradoneis lyra			1	1																																4
	Apistobranchus tullbergi																							1													4
	Poecilochaetus serpens																			1									3					1			10
	Aonides paucibranchiata			2						1		1		1				2		1													1				18
	Laonice				1																																1
	Laonice bahusiensis					1																															5
	Laonice sarsi																																				2
	Minuspio cirrifera				2				1																1												10
	Dipolydora caeca			1						1																											3
	Dipolydora caulleryi					1																															1
	Pseudopolydora paucibranchiata																																				1
	Scolelepis						2																														5
	Scolelepis bonnieri		1													1																					4
	Scolelepis (Scolelepis) foliosa																																				1
	Scolelepis korsuni													2					3	2	1																11
	Spio goniocephala																																				1
	Spiophanes bombyx	1	1				3	5	9	2	1	2	1		4		2	4	3	1	3	2	1	4	4	5	1	6	18	27	9	28	31	40	65	27	581
	Spiophanes kroyeri				2		1	1	2		1								1						2	1			3		1		1		1		45
	Magelona alleni																																	3	1		7
	Magelona filiformis		4			2			1							1	1					1											3	3	2	63
	Magelona johnstoni	6	5			1																												1	3	89
	Chaetopterus variopedatus																																				1
	Aphelochaeta (Type A)							1												1																	3
	Chaetozone christiei							1		3	4		1		3			3	1	3		2	2						3			1	3	3	3	2	48
	Chaetozone setosa					1						3		1					1			1		7	3	1	2	1									62
	Caulleriella zetlandica			1		1																															4
	Cirratulus caudatus																		1																		5
	Cauleriella killariensis			1										1					1																		7

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		TCC_62	TCC_64	TCC_71	TCC_75	TCC_76	TCC_78	TCC_79	TCC_80	TCC_82	TCC_84	TCC_85	TCC_86	TCC_87	TCC_90	TCC_92	TCC_93	TCC_94	TCC_95	TCC_97	TCC_99	TCC_100	TCC_101	TCC_102	TCC_103	TCC_106	TCC_107	TCC_109	TCC_111	TCC_112	TCC_113	TCC_114	TCC_115	TCC_116	TCC_118	TCC_120	
	Diplocirrus glaucus										2							1								4	2	7			2	1		2	3		**60**
	Pherusa plumosa				2																																**2**
	Heteromastus filiformis																2				1		1		1	1											**17**
	Mediomastus fragilis																																				**2**
	Notomastus latericeus																									3										1	**18**
	Peresiella clymenoides			10	3																							1									**25**
	Maldanidae																																				**3**
	Clymenura								1																												**1**
	Euclymene (Type A)																																				**1**
	Praxillella affinis																								4	12	6										**71**
	Rhodine																																				**2**
	Rhodine gracilior																																				**5**
	Ophelia (juv)																																				**1**
	Ophelia borealis						5	5	5	11					3					6	1								20				2		1		**59**
	Ophelina acuminata			2																									1								**5**
	Polyphysia crassa																																				**1**
	Scalibregma inflatum																											1				2		1		**5**
	Galathowenia oculata				1		11		6				2	13	7	5	7	4	1	2	1		2	2	17	77	44	74									**409**
	Myriochele danielsseni							4									3						5	1	2		1	9									**47**
	Owenia fusiformis			7			2		1		1			4	3	8	3	4	3	4	1	1	3		5	3	1	2								1	**124**
	Pectinariidae (juv)																																				**4**
	Amphictene auricoma				1																					1				4	5	9	22	1	2	2	**78**
	Lagis koreni									1		1																	5	1	1	4	8	3	12	4	**103**
	Ampharetidae			2		1																			2		1	1									**17**
	Ampharete falcata													1	1				2						1	10	7	1	1								**100**
	Ampharete finmarchica																																				**3**
	Ampharete lindstroemi			3																					1		2	3									**42**
	Amphicteis gunneri																																				**1**
	Anobothrus gracilis				1			1	1																												**5**
	Terebellides stroemii			1	19	1	1																														**28**
	Trichobranchus roseus				12																		1					3									**37**
	Terebellidae (juv)																																				**1**
	Eupolymnia nesidensis				7																																**7**
	Lanice conchilega																												2							1	**5**
	Phisidia aurea				2																																**2**
	Pista cristata							1	1																												**2**
	Polycirrus				3		2																														**6**
	Streblosoma bairdi																																				**1**
	Streblosoma intestinale																										1										**4**
	Thelepus cincinnatus																																				**1**
	Thelepus setosus																																				**2**
	Sabellidae																																				**1**
	Sabellidae (juv)																																				**2**
	Chone dunerificta				3																																**3**
	Euchone rubrocincta					1																															**2**
	Serpulidae				7	19																															**34**

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	Hydroides norvegicus				16	5			1																													**53**
	Spirobranchus				5																																	**5**
	Spirobranchus lamarcki																																		1			**1**
	Spirobranchus triqueter				35	24																																**60**
ARTHROPODA - Crustacea	*Sarsinebalia urgorrii*								2																													**2**
	Schistomysis ornata													1																								**1**
	Apherusa bispinosa																																					**1**
	Eusirus longipes				1																																	**1**
	Perioculodes longimanus													1																								**1**
	Pontocrates altamarinus													1			1																					**2**
	Synchelidium maculatum																													1								**1**
	Westwoodilla caecula			1					1							1										1		1											**8**
	Parapleustes assimilis																																					**1**
	Stenopleustes nodifera																																					**1**
	Leucothoe incisa																																					**1**
	Leucothoe lilljeborgi																																					**1**
	Urothoe elegans						1	1	3	1					1					2									1									**12**
	Harpinia antennaria										1	1		1	1	2	7	5	3		2	1	1	1	4	1		1	1	2	1			1				**87**
	Harpinia pectinata																										1											**1**
	Hippomedon denticulatus			1							1			1			1			1	1				2													**16**
	Lepidepecreum longicornis				1	1																							1									**3**
	Scopelocheirus hopei					1								1						1																			**3**
	Tmetonyx cicada																																					**4**
	Nototropis falcatus		1																																			**1**
	Atylus vedlomensis			1	1																	1																**8**
	Ampelisca			2																										1			1					**8**
	Ampelisca brevicornis																					1							3	4	2	2		2	3	1	**26**
	Ampelisca diadema													1																								**5**
	Ampelisca macrocephala														2		1		1																			**8**
	Ampelisca spinipes			6		1	2																						1				1					**17**
	Ampelisca tenuicornis			1																						2		2				1		1				**24**
	Bathyporeia		2																																			**5**
	Bathyporeia elegans	3	3							3	1	1		1	1	2	1			1									5	1							1	**33**
	Bathyporeia gracilis						1	4						1					2												1	2						**13**
	Bathyporeia guilliamsoniana																																					**36**
	Bathyporeia tenuipes																		2											1								**3**
	Melitidae				1					1																													**2**
	Cheirocratus sundevallii																																					**1**
	Othomaera othonis				1																																	**2**
	Maerella tenuimana																																					**1**
	Gammaropsis maculata																																					**1**
	Photis longicaudata																																					**2**
	Aoridae (female)									1							1																					**5**
	Aoridae (juv)																																					**1**
	Autonoe longipes																																					**1**
	Corophiidae		4							1																												**7**

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	Dyopedos monacantha																																					1
	Caprella linearis																																					4
	Pariambus typicus																											1										3
	Phtisica marina																																					4
	Hyperiidae																						1															2
	Gnathiidae (juv)																															1						1
	Gnathia oxyuraea																															1						1
	Astacilla dilatata													1														2										4
	Araphura brevimana																																					1
	Akanthophoreus gracilis																																					1
	Bodotria scorpioides			3																																		3
	Eudorella emarginata																1																					4
	Eudorellopsis deformis																	1				2			1													7
	Diastylis																																					2
	Diastylis bradyi																								2													8
	Diastylis laevis																									1												2
	Diastylis rugosa																												3				1					4
	DECAPODA (juv)																																					1
	Pandalina brevirostris				1																																	1
	Crangonidae																								2								1					3
	Philocheras bispinosus bispinosus																																					2
	Philocheras trispinosus	1																																				2
	Crangon allmanni																																					2
	Callianassa (juv)									1															1													4
	Callianassa subterranea																																					1
	Paguridae (juv)																																					3
	Anapagurus																																					1
	Anapagurus hyndmanni																																					1
	Pagurus bernhardus																																					1
	Galathea			1																																		1
	Galathea (juv)		1		23	2																																27
	Galathea intermedia				5																											2						8
	Pisidia longicornis				1																																	1
	Ebalia (juv)													1																		1						3
	Ebalia tuberosa																																					1
	Hyas (juv)																																					1
	Hyas coarctatus				1																																	1
	Inachus dorsettensis																																					1

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	Corystes cassivelaunus																																				1	1
	Liocarcinus (juv)			2																			1															3
	Liocarcinus holsatus				2																																	2
MOLLUSCA - Caudofoveata	*Chaetoderma nitidulum*														1								1	1	2	6		1										26
Polyplacophora	POLYPLACOPHORA (juv)					2																																2
	Leptochiton asellus				5	1																																6
Gastropoda	*Polinices* (juv)																															1						1
	Euspira pulchella																																					2
	Epitonium trevelyanum																																					1
	Vitreolina philippi																																					4
	Buccinum undatum																															1						1
	Raphitoma linearis																																					1
	CEPHALASPIDEA									1																												1
	Acteon tornatilis													1												2					2							10
	Philine													2			2		3		2	1		1		1	1		2	4	1		2					54
	Cylichna cylindracea					1					1								2				1	1	1				1	2	3	2		2	1			52
	Roxania utriculus																																					2
	Goniodoris nodosa				1																																	1
	Onchidoridae				1	1																																2
	Dendronotus frondosus																																					1
	Facelina				2																																	2
Scaphopoda	*Antalis entalis*										1					1									1													17
Bivalvia	*Nucula hanleyi*																															1						1
	Nucula nitidosa	1	1								2	2											1					1	4	5	3	16		3			101
	Nucula nucleus				2																																	2
	Ennucula tenuis			1		1				1			1	5	7	4	1	4	4	2	2						1	1	1									68
	Pectinidae (juv)			1																																		1
	Anomiidae (juv)					1																																1
	Lucinoma borealis										1		1		1													2		1	3		2					35
	Thyasira																																					4
	Thyasira flexuosa																					1	1	1	3	1		1			3	1		2				63
	Thyasira equalis																								2		5	4										24
	Thyasira biplicata																																					12
	Montacuta substriata								1																													1
	Kurtiella bidentata									4	2			4	5	1					13									3		1	2					53
	Tellimya ferruginosa					1		1			3				1																		2		2			24
	Astartidae (juv)																	1																				1
	Astarte montagui									1																													1
	Cardiidae (juv)				1																		1			1						1						11
	Parvicardium pinnulatum				2																																	2
	Mactridae (juv)	6								1		1	1		1			1	1					1						1								22
	Mactra stultorum																																					1
	Spisula elliptica														1																							1
	Ensis		1																																			1

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	Phaxas pellucidus			1				2		1	1		3				1			1					4	2			2	2	1	2	2	6	3	2	**68**
	Angulus fabula	5	4																													11		12	4	18	**72**
	Gari (juv)																																		1	2	**3**
	Gari fervensis																																		1		**1**
	Gari costulata																																				**1**
	Abra			1																																	**1**
	Abra (juv)							3					2					1	2								1	5				2			1		**20**
	Abra nitida																2									1		1			1			1				**12**
	Abra prismatica	1	11				3		1	3		4				1	1		1				1						7	8	4	4		13	3	1	**99**
	Arctica islandica (juv)		1							1				1							1																	**10**
	Dosinia (juv)			3						1																				2					2	1	**12**
	Dosinia lupinus				1				1		1																							1				**7**
	Chamelea striatula	2										3	1	1	1		3	1				2			1	2	1	2	1		2	1		1	2		**59**
	Clausinella fasciata					1																	2	1													**4**
	Timoclea ovata																																1				**5**
	Mysia undata																																				**1**
	Corbula gibba																																				**1**
	Hiatella arctica					1																	1					1									**8**
	Thracia							1																									1				**2**
	Thracia (juv)		1																															1	2		**5**
	Thracia phaseolina																														5		3	1	1	**13**
	Cochlodesma praetenue			1					2									1										2	3		1						**13**
	Lyonsia norwegica			1																																	**1**
	Cuspidariidae																																				**1**
	Cuspidariidae (juv)																											1									**1**
ECHINODERMATA - Asteroidea	ASTEROIDEA (juv)				1																			1				2	3	1	3		1		1	**30**
	Luidia sarsii																																				**1**
	Astropecten irregularis																																				**1**
Ophiuroidea	OPHIUROIDEA (juv)	1		5	3	1	1	2		4		7	1	17		5	8	8		7	11		10	36	21	10	7	2	17	15	10	3	6	7		1	**401**
	Acrocnida brachiata																																	10			**10**
	Amphiura					1																															**5**
	Amphiura filiformis			4						5	1		1	3	2	1			1	2	2	2	1		8		2	1	10	17	8	16	22	8	4		**207**
	Ophiuridae (juv)			1		2												1	2			1					1					1			6		**27**
	Ophiura albida					1																															**3**
	Ophiocten affinis														1	1																					**5**
Echinoidea	ECHINOIDEA (juv)		5		4							4	2	6		12	7	6	5		5				7			2	2		4	1		1			**234**
	Echinocyamus pusillus			4	8	9	16	17	7	9	1	3		1	5	6	3	4	5	8	3								19	3			2		2		**162**
	Spatangus purpureus								1																												**2**
	Echinocardium																							1													**1**
	Echinocardium cordatum	1									1																						1		1		**10**
	Echinocardium flavescens		1					1	2					1			1		1											1							**10**
Holothuroidea	Cucumariidae					1																															**1**
	Pseudothyone raphanus								2											1					3	3		2										**43**
	Leptopentacta elongata												1																									**2**
	Leptosynapta					2																																**2**
	Leptosynapta inhaerens				2																																	**3**

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Teesside Cable Corridor

Phylum Class/Order	Taxon	STATIONS																																					Total
		TCC_62	TCC_64	TCC_71	TCC_75	TCC_76	TCC_78	TCC_79	TCC_80	TCC_82	TCC_84	TCC_85	TCC_86	TCC_87	TCC_90	TCC_92	TCC_93	TCC_94	TCC_95	TCC_97	TCC_99	TCC_100	TCC_101	TCC_102	TCC_103	TCC_106	TCC_107	TCC_109	TCC_111	TCC_112	TCC_113	TCC_114	TCC_115	TCC_116	TCC_118	TCC_120	
	Labidoplax buskii					1												1					1					4										31
Foraminifera	*Astrorhiza*			3					4	1	3			16	9	12	6	9	11	10	11		1															147
Cnidaria - Anthozoa	*Virgularia mirabilis*								1	1			1		1																							14
	Pennatula phosphorea																																						5
	Cerianthus lloydii			4	2	3	1	1	2					1												1												36
	ACTINIARIA								6														1															12
	Adamsia palliata				1																																		1
	Edwardsiidae					4																						1		2									24
Platyhelminthes	Turbellaria																																						2
	NEMERTEA				3	2	3	5						1		1	1			2			1		3	6	5			1	1		3		3			97
Sipuncula	Golfingiidae (juv)						1																																4
	Golfingia																																						1
	Golfingia (Golfingia) elongata																																						1
	Phascolion (Phascolion) strombus strombus																					1																	2
ARTHROPODA - Pycnogonida	*Nymphon brevirostre*																																						1
	Achelia simplex																																						1
	Anoplodactylus petiolatus																							1															2
Phoronida	*Phoronis*								3	1	2		5		2	1		1			1	1	1	1	1		1		1		3	4	3	6	1		145
Hemichordata	ENTEROPNEUSTA																					1				1												3
	Individuals	**35**	**53**	**121**	**221**	**114**	**67**	**68**	**77**	**77**	**42**	**38**	**37**	**113**	**67**	**77**	**74**	**71**	**83**	**68**	**80**	**35**	**51**	**77**	**146**	**172**	**113**	**160**	**156**	**124**	**80**	**133**	**152**	**142**	**193**	**77**	**6745**
	Taxa	**16**	**20**	**46**	**53**	**44**	**22**	**24**	**33**	**35**	**25**	**14**	**22**	**37**	**27**	**25**	**29**	**26**	**34**	**26**	**25**	**22**	**31**	**21**	**38**	**32**	**25**	**38**	**36**	**31**	**29**	**32**	**38**	**34**	**50**	**23**	**329**

Juveniles

Phylum Class/Order	Taxon	STATIONS																																					Total
		TCC_62	TCC_64	TCC_71	TCC_75	TCC_76	TCC_78	TCC_79	TCC_80	TCC_82	TCC_84	TCC_85	TCC_86	TCC_87	TCC_90	TCC_92	TCC_93	TCC_94	TCC_95	TCC_97	TCC_99	TCC_100	TCC_101	TCC_102	TCC_103	TCC_106	TCC_107	TCC_109	TCC_111	TCC_112	TCC_113	TCC_114	TCC_115	TCC_116	TCC_118	TCC_120	
Taxa excluded in Statistical Analysis																																							
Cnidaria	FILIFERA																			P																			
	Bougainvilliidae																																						
	Lovenella clausa																																						
	Halecium			P																																			
	Abietinaria abietina			P																																			
	Sertularella					P																																	
	Sertularia				P																																		
	Sertularia distans				P																																		
	Plumulariidae																																						
	Campanulariidae				P																																		
	Clytia hemisphaerica																	P																					
	Alcyonium digitatum			P		P																									P								
Nematoda	NEMATODA		35																												3	1						**86**

APPENDIX E – MACROFAUNAL ANALYSIS

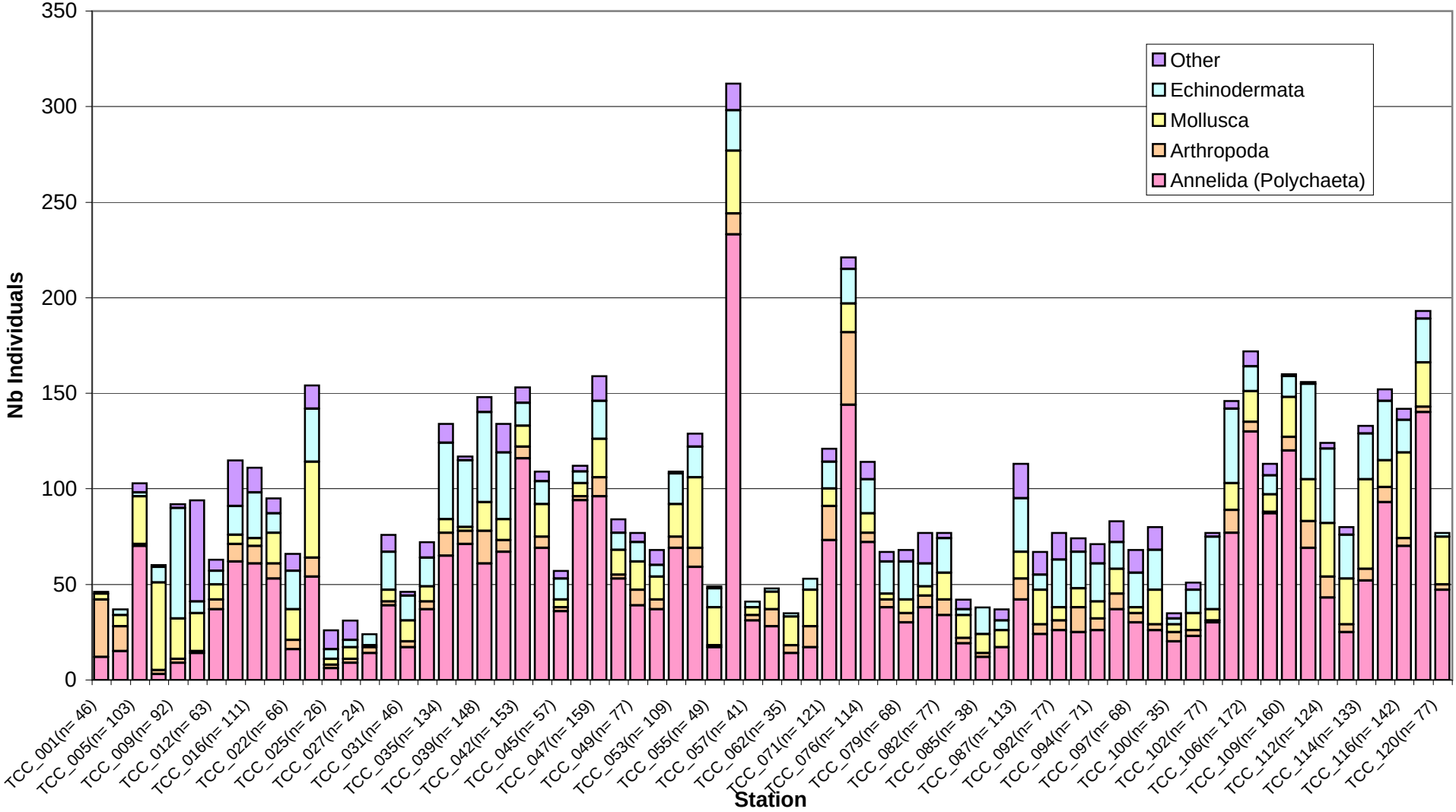
Teesside Cable Corridor

Phylum Class/Order	Taxon	STATIONS																																					Total
		TCC_62	TCC_64	TCC_71	TCC_75	TCC_76	TCC_78	TCC_79	TCC_80	TCC_82	TCC_84	TCC_85	TCC_86	TCC_87	TCC_90	TCC_92	TCC_93	TCC_94	TCC_95	TCC_97	TCC_99	TCC_100	TCC_101	TCC_102	TCC_103	TCC_106	TCC_107	TCC_109	TCC_111	TCC_112	TCC_113	TCC_114	TCC_115	TCC_116	TCC_118	TCC_120	
Bryozoa	*Crisia*					P																																	
	Tubulipora																																						
	Alcyonidium diaphanum																																						
	Alcyonidium parasiticum			P		P				P																													
	Eucratea loricata					P		P	P						P																									
	Electra pilosa																																						
	Flustra foliacea	P																																					
	Callopora dumerilii														P																									
	Amphiblestrum auritum																																						
	Bugula																																						
	Bugula avicularia																																						
	Bugula purpurotincta																																						
	Scrupocellaria scabra					P																																	
	Palmiskenea skenei																		P																				

APPENDIX E – MACROFAUNAL ANALYSIS

Teesside Cable Corridor

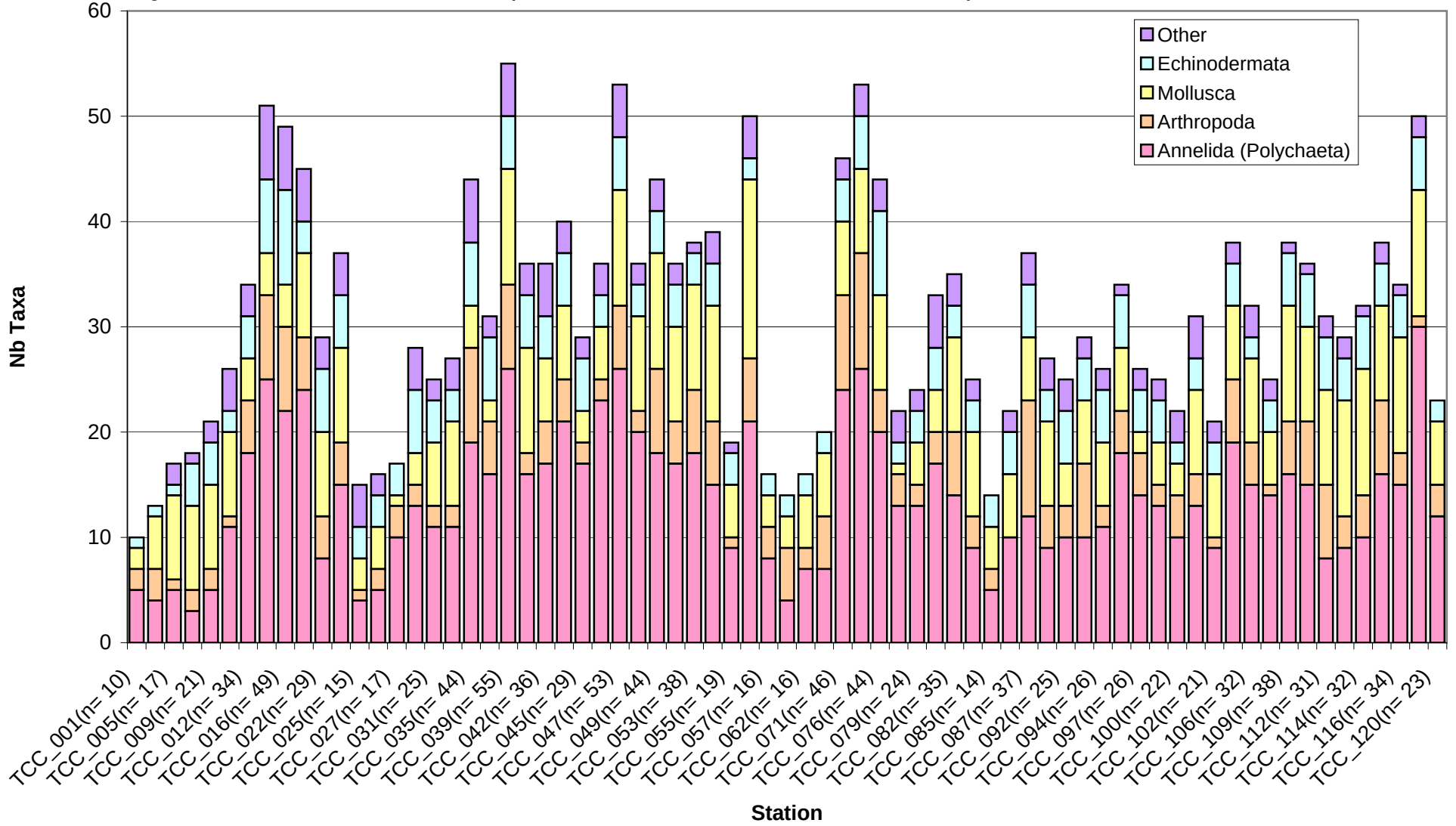
Figure E.3 Teesside Cable Corridor Proportional Individual Contribution of Gross Taxonomic Groups



APPENDIX E – MACROFAUNAL ANALYSIS

Teesside Cable Corridor

Figure E.4 Teesside Cable Corridor Proportional Taxa Contribution of Gross Taxonomic Groups



APPENDIX E – MACROFAUNAL ANALYSIS

Teesside Cable Corridor

Table E.6 Teesside Cable Corridor Benthic Biomass (g Ash-Free Dry Weight)

Station	Annelida (g)	Crustacea (g)	Mollusca (g)	Echinodermata (g)	Miscellania (g)	Total
TCC_01	0.0283	0.0081	0.0008	0.1798	-	0.2170
TCC_03	0.0120	0.0027	0.0020	0.0048	0.0000	0.0215
TCC_05	0.0542	0.0000	0.0108	0.1191	0.0026	0.1867
TCC_06	0.0086	0.0023	0.0439	0.1936	0.0003	0.2487
TCC_09	0.0132	0.0002	0.0166	1.1559	0.1696	1.3555
TCC_10	0.3331	0.0036	0.0130	0.0095	3.2564	3.6156
TCC_12	0.0426	0.0136	0.0744	0.0018	0.0114	0.1438
TCC_14	0.0436	0.0072	0.0012	0.0177	0.0126	0.0823
TCC_16	0.0857	0.0999	0.0016	0.0087	0.0519	0.2478
TCC_18	0.0632	0.0250	0.6563	0.0037	0.0067	0.7549
TCC_22	0.0625	0.0025	0.1503	0.7708	0.0353	1.0214
TCC_24	0.1164	0.0019	0.2490	0.0201	0.0651	0.4525
TCC_25	0.0076	0.0010	0.0059	0.0040	0.0287	0.0472
TCC_26	0.0207	0.0106	0.0076	0.0017	0.0206	0.0612
TCC_27	0.0484	0.0174	0.0010	0.0085	0.0001	0.0754
TCC_29	0.1053	0.0014	0.0072	0.2490	0.0548	0.4177
TCC_31	0.0124	0.0039	0.0162	0.0170	0.0069	0.0564
TCC_32	0.0311	0.0011	0.0063	0.0024	0.0444	0.0853
TCC_35	0.1295	0.0190	0.0088	0.0054	0.0565	0.2192
TCC_37	0.0741	0.0009	0.0001	0.0360	0.0015	0.1126
TCC_39	0.0817	0.0090	0.0523	0.0218	0.0249	0.1897
TCC_40	0.1572	0.0016	0.0071	0.0058	0.0161	0.1878
TCC_42	0.1262	0.0272	0.0616	0.0294	0.0301	0.2745
TCC_43	0.1578	0.0009	0.0218	0.0121	0.0157	0.2083
TCC_45	0.0465	0.0005	0.0010	0.0141	0.0056	0.0677
TCC_46	0.0365	0.0018	0.0080	0.0117	0.0053	0.0633
TCC_47	0.1480	0.0144	0.2159	0.0354	0.0821	0.4958
TCC_48	0.6375	0.0005	0.0277	0.0065	0.0248	0.6970
TCC_49	0.0978	0.0021	0.0175	0.0512	0.0076	0.1762
TCC_52	0.0288	0.0028	0.0180	0.0676	0.0195	0.1367
TCC_53	0.0418	0.0014	0.0110	0.0117	0.0004	0.0663
TCC_54	0.0578	0.0021	0.0792	0.0107	0.0045	0.1543
TCC_55	0.0923	0.0502	0.0462	0.0419	0.0001	0.2307
TCC_56	0.0937	0.0043	0.3202	0.0095	0.2127	0.6404
TCC_57	0.0611	0.0012	0.0013	0.0186	0.0000	0.0822
TCC_61	0.0325	0.0132	0.0181	0.0099	0.0000	0.0737

APPENDIX E – MACROFAUNAL ANALYSIS

Teesside Cable Corridor

Table E.6 Teesside Cable Corridor Benthic Biomass (g Ash-Free Dry Weight)

Station	Annelida (g)	Crustacea (g)	Mollusca (g)	Echinodermata (g)	Miscellania (g)	Total
TCC_62	0.0582	0.0042	0.0131	0.3818	0.0011	0.4584
TCC_64	0.0136	0.0009	1.3729	0.3861	-	1.7735
TCC_71	0.1552	0.1208	0.1131	0.0155	0.0166	0.4212
TCC_75	0.1953	0.4164	0.6915	0.0113	0.5204	1.8349
TCC_76	0.1002	0.0074	0.0041	0.0866	0.0211	0.2194
TCC_78	0.1197	0.0008	0.0030	0.0061	0.0864	0.2160
TCC_79	0.0248	0.0009	0.0315	0.5670	0.0059	0.6301
TCC_80	0.0523	0.0015	0.0797	0.9093	0.1103	1.1531
TCC_82	0.0227	0.0013	0.0343	0.0170	0.0073	0.0826
TCC_84	0.0222	0.0054	0.0102	1.6355	0.0212	1.6945
TCC_85	0.0077	0.0006	0.0080	0.0028	-	0.0191
TCC_86	0.0432	0.0003	0.0042	0.0649	0.0035	0.1161
TCC_87	0.0403	0.0022	0.0038	1.1124	0.1316	1.2903
TCC_90	0.0693	0.0056	0.0908	0.0149	0.0799	0.2605
TCC_92	0.0797	0.0016	0.0042	0.0080	0.0839	0.1774
TCC_93	0.0161	0.0048	0.0053	0.3565	0.0321	0.4148
TCC_94	0.0403	0.0018	0.1370	0.1988	0.0053	0.3832
TCC_95	0.3377	0.0046	0.0021	0.2144	0.1266	0.6854
TCC_97	0.0250	0.0062	0.0030	0.0067	0.0571	0.0980
TCC_99	0.0364	0.0006	0.0040	0.0097	0.0507	0.1014
TCC_100	0.0314	0.0011	0.0059	0.0014	0.0500	0.0898
TCC_101	0.0939	0.0235	0.0076	0.0038	0.4623	0.5911
TCC_102	0.0502	0.0002	0.0045	0.1020	0.0010	0.1579
TCC_103	0.0693	0.0115	0.0358	0.0249	0.0036	0.1451
TCC_106	0.1420	0.0024	0.0203	0.0507	0.0859	0.3013
TCC_107	0.6298	0.0000	0.0059	0.0009	0.0124	0.6490
TCC_109	0.0388	0.0014	0.0556	0.0073	0.0133	0.1164
TCC_111	0.0302	0.0032	0.0055	0.0290	0.0025	0.0704
TCC_112	0.0814	0.0047	0.1013	0.1160	0.0035	0.3069
TCC_113	0.0235	0.0010	0.1373	0.0360	0.0014	0.1992
TCC_114	0.0660	0.0043	0.0319	0.0665	0.0011	0.1698
TCC_115	0.0343	0.0080	0.0646	0.2294	4.9860	5.3223
TCC_116	0.1008	0.0019	0.2542	0.0365	0.0038	0.3972
TCC_118	0.8339	0.0018	0.0471	0.2027	0.0006	1.0861
TCC_120	0.0760	0.1071	0.0449	0.0003	-	0.2283

APPENDIX E – MACROFAUNAL ANALYSIS

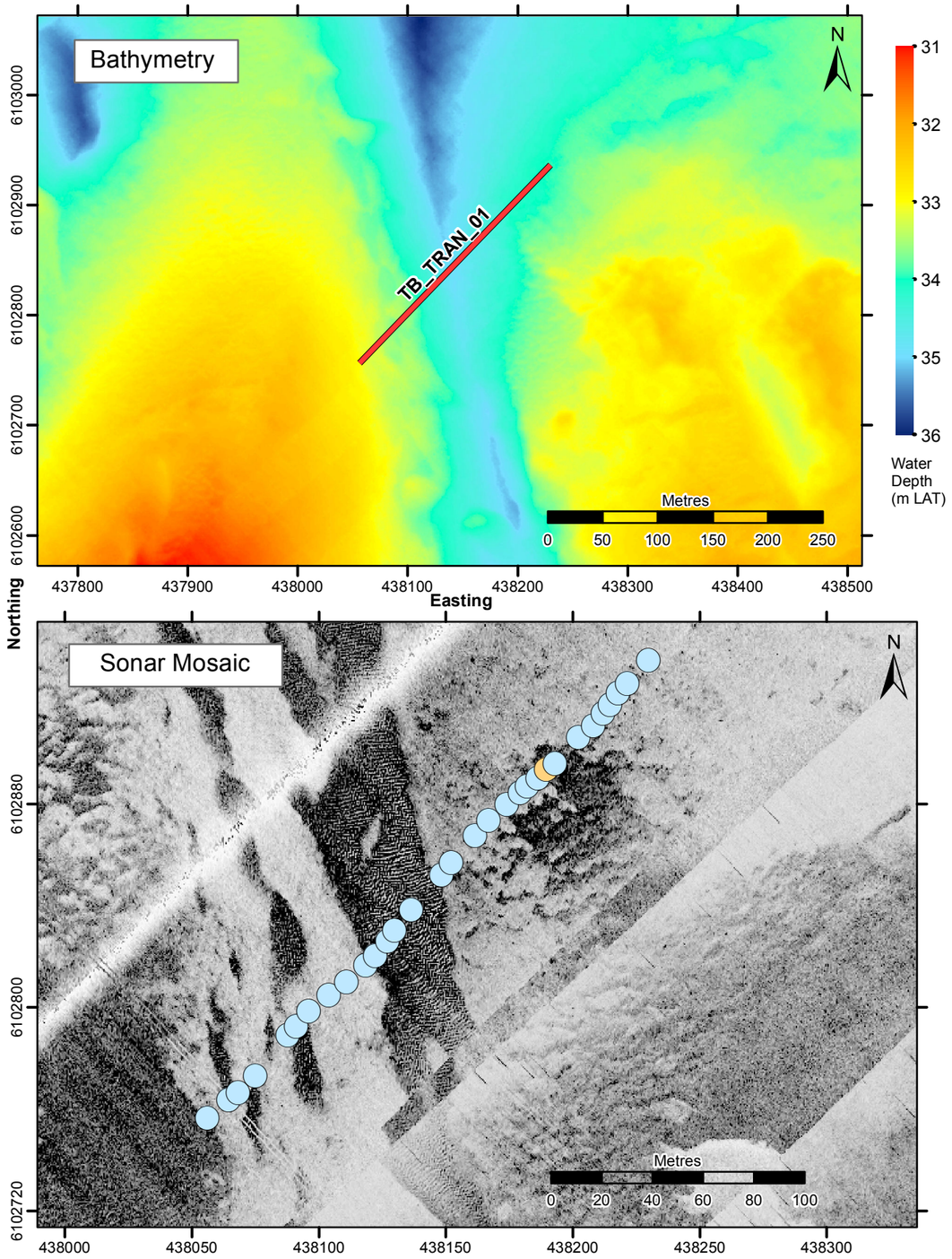
Teesside Cable Corridor

Table E.7 Teesside Cable Corridor Univariate Statistics Results

Station	Taxa	Individuals	Pielou's Evenness (J)	Shannon Wiener Diversity (H')	Simpson's Dominance (λ)
TCC_01	10	46	0.64	2.12	0.39
TCC_03	13	37	0.91	3.35	0.12
TCC_05	17	103	0.69	2.82	0.23
TCC_06	18	60	0.73	3.06	0.22
TCC_09	21	92	0.70	3.09	0.22
TCC_10	26	94	0.70	3.28	0.24
TCC_12	34	63	0.93	4.73	0.05
TCC_14	51	115	0.90	5.10	0.05
TCC_16	49	111	0.86	4.83	0.06
TCC_18	45	95	0.89	4.89	0.05
TCC_22	29	66	0.91	4.43	0.06
TCC_24	37	154	0.84	4.38	0.07
TCC_25	15	26	0.93	3.64	0.09
TCC_26	16	31	0.92	3.70	0.09
TCC_27	17	24	0.95	3.89	0.08
TCC_29	28	76	0.86	4.15	0.08
TCC_31	25	46	0.92	4.28	0.07
TCC_32	27	72	0.81	3.87	0.13
TCC_35	44	134	0.84	4.56	0.08
TCC_37	31	117	0.82	4.07	0.09
TCC_39	55	148	0.84	4.87	0.07
TCC_40	36	134	0.84	4.33	0.07
TCC_42	36	153	0.76	3.94	0.14
TCC_43	40	109	0.87	4.63	0.06
TCC_45	29	57	0.94	4.56	0.06
TCC_46	36	112	0.78	4.04	0.13
TCC_47	53	159	0.88	5.04	0.05
TCC_48	36	84	0.87	4.49	0.07
TCC_49	44	77	0.92	5.00	0.05
TCC_52	36	68	0.92	4.75	0.05
TCC_53	38	109	0.85	4.47	0.07
TCC_54	39	129	0.86	4.55	0.07
TCC_55	19	49	0.93	3.95	0.08
TCC_56	50	312	0.63	3.54	0.23
TCC_57	16	41	0.81	3.24	0.18
TCC_61	14	48	0.73	2.77	0.26
TCC_62	16	35	0.90	3.60	0.10
TCC_64	20	53	0.90	3.88	0.09
TCC_71	46	121	0.86	4.76	0.07
TCC_75	53	221	0.84	4.79	0.06
TCC_76	44	114	0.81	4.45	0.09
TCC_78	22	67	0.85	3.78	0.11
TCC_79	24	68	0.86	3.93	0.10
TCC_80	33	77	0.91	4.60	0.05
TCC_82	35	77	0.90	4.60	0.06
TCC_84	25	42	0.94	4.37	0.06
TCC_85	14	38	0.94	3.57	0.10
TCC_86	22	37	0.91	4.07	0.08
TCC_87	37	113	0.83	4.33	0.08
TCC_90	27	67	0.90	4.30	0.07
TCC_92	25	77	0.87	4.04	0.08
TCC_93	29	74	0.91	4.42	0.06
TCC_94	26	71	0.91	4.26	0.07
TCC_95	34	83	0.92	4.69	0.05
TCC_97	26	68	0.90	4.22	0.07
TCC_99	25	80	0.86	4.00	0.09
TCC_100	22	35	0.95	4.25	0.06
TCC_101	31	51	0.91	4.49	0.07
TCC_102	21	77	0.68	2.97	0.25
TCC_103	38	146	0.86	4.54	0.06
TCC_106	32	172	0.68	3.39	0.22
TCC_107	25	113	0.72	3.35	0.19
TCC_109	38	160	0.68	3.56	0.23
TCC_111	36	156	0.85	4.39	0.07
TCC_112	31	124	0.82	4.07	0.10
TCC_113	29	80	0.91	4.42	0.06
TCC_114	32	133	0.82	4.10	0.09
TCC_115	38	152	0.79	4.17	0.10
TCC_116	34	142	0.80	4.09	0.11
TCC_118	50	193	0.76	4.28	0.13
TCC_120	23	77	0.73	3.30	0.19
Min	**10**	**24**	**0.63**	**2.12**	**0.05**
Max	**55**	**312**	**0.95**	**5.10**	**0.39**
Mean	**31**	**95**	**0.84**	**4.09**	**0.11**
SD	**11**	**51**	**0.08**	**0.61**	**0.07**

APPENDIX F – STONY REEF ASSESSMENT

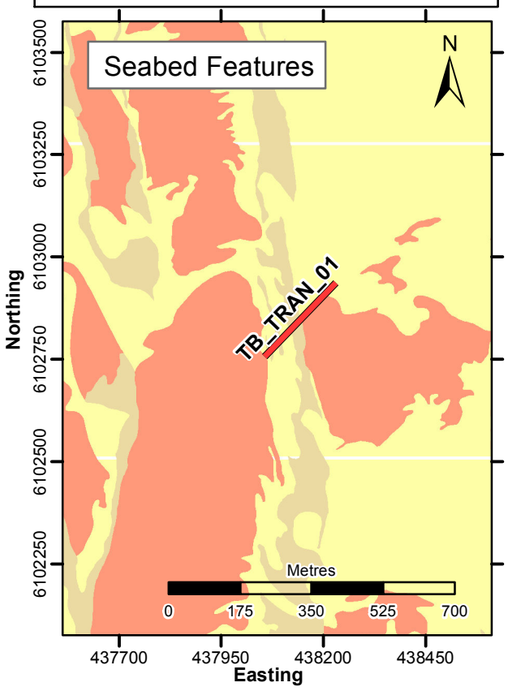
APPENDIX F - STONY REEF ASSESSMENT
Tranche B



Key

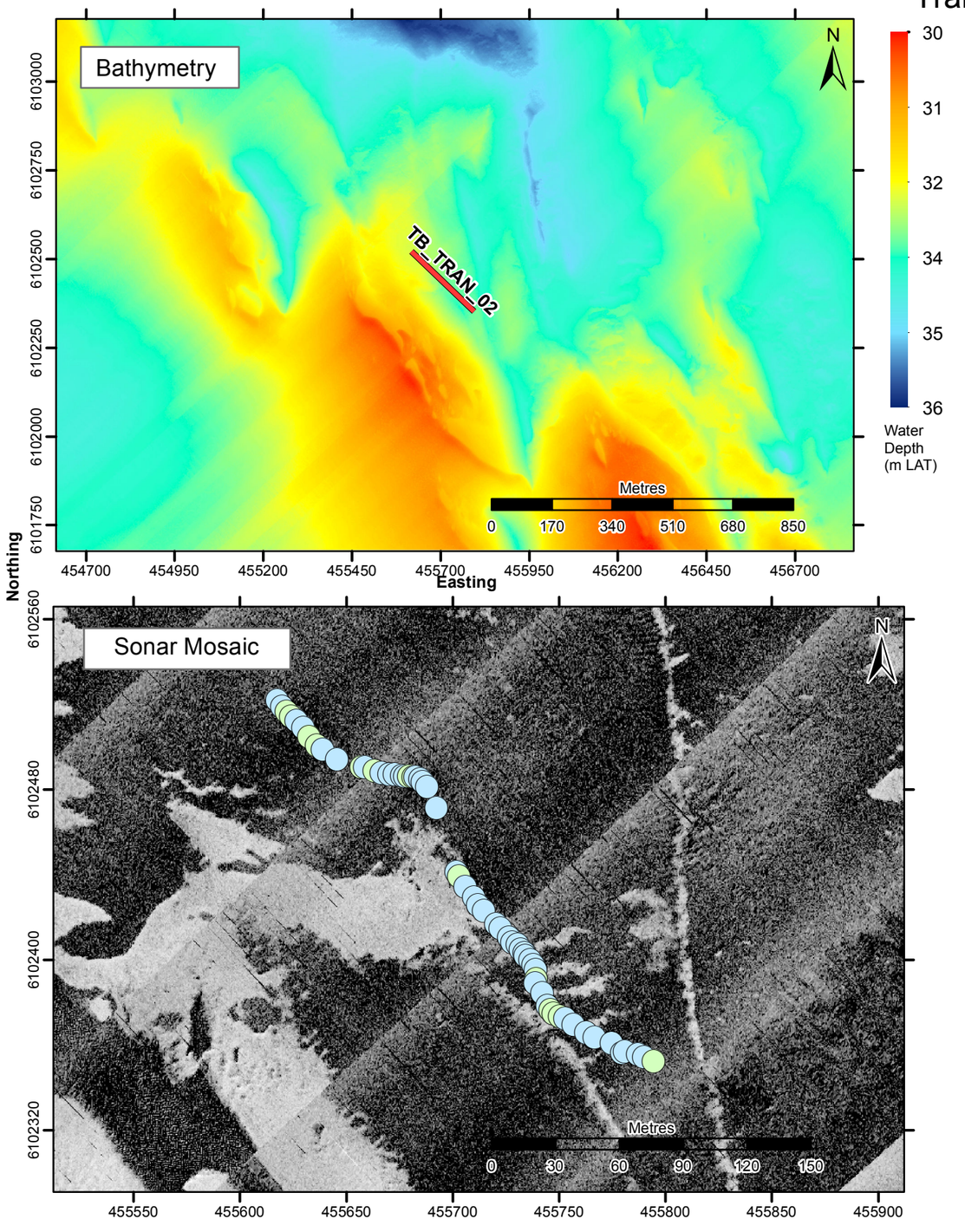
- Transect
- Boulder clay till
- Coarse material and depressions
- Coarse sand
- Fine to medium sand
- Gravelly sand
- Gravelly sand with megaripples
- Silty sand
- Not a 'stony reef'
- Low Resemblance
- Medium Resemblance
- High Resemblance

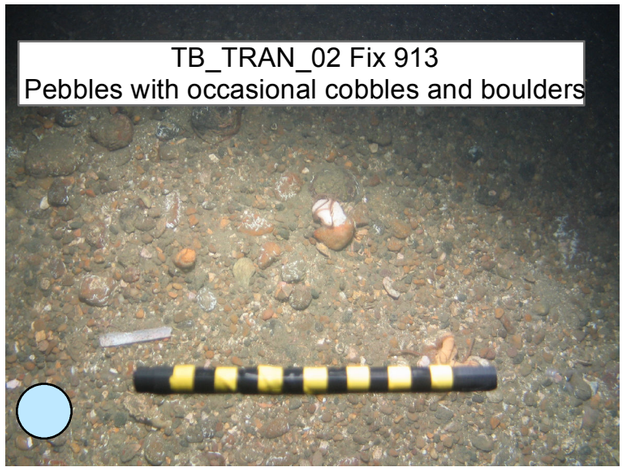
Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E

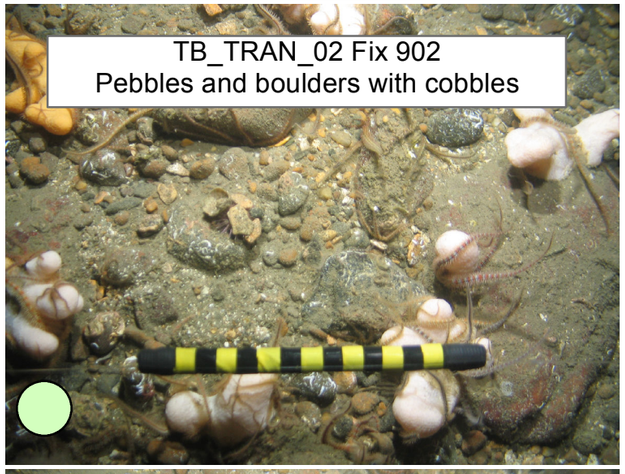


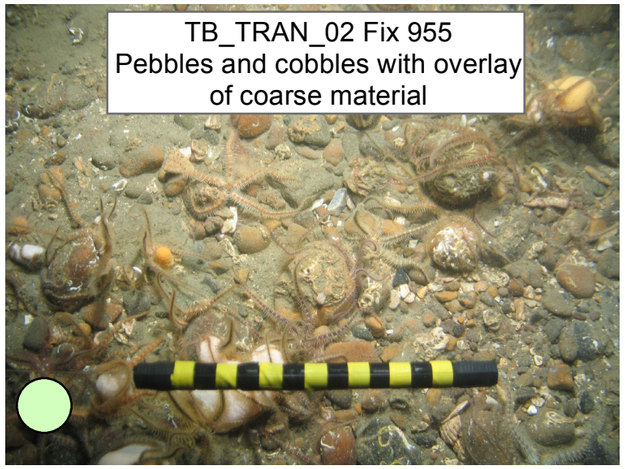
APPENDIX F - STONY REEF ASSESSMENT

Tranche B





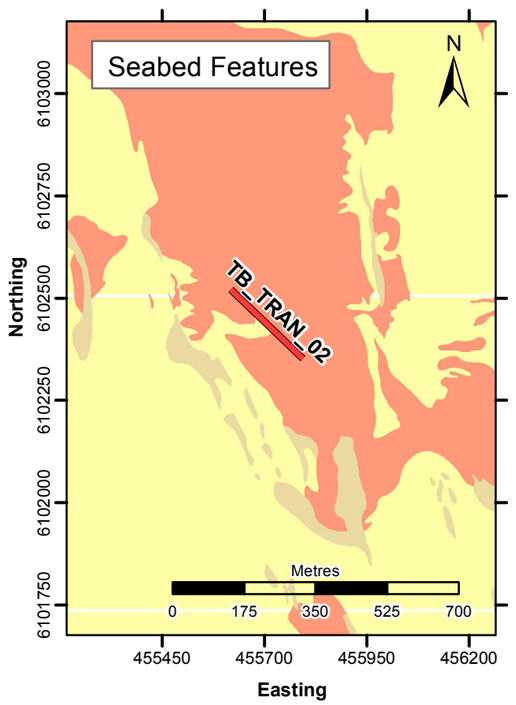




Key

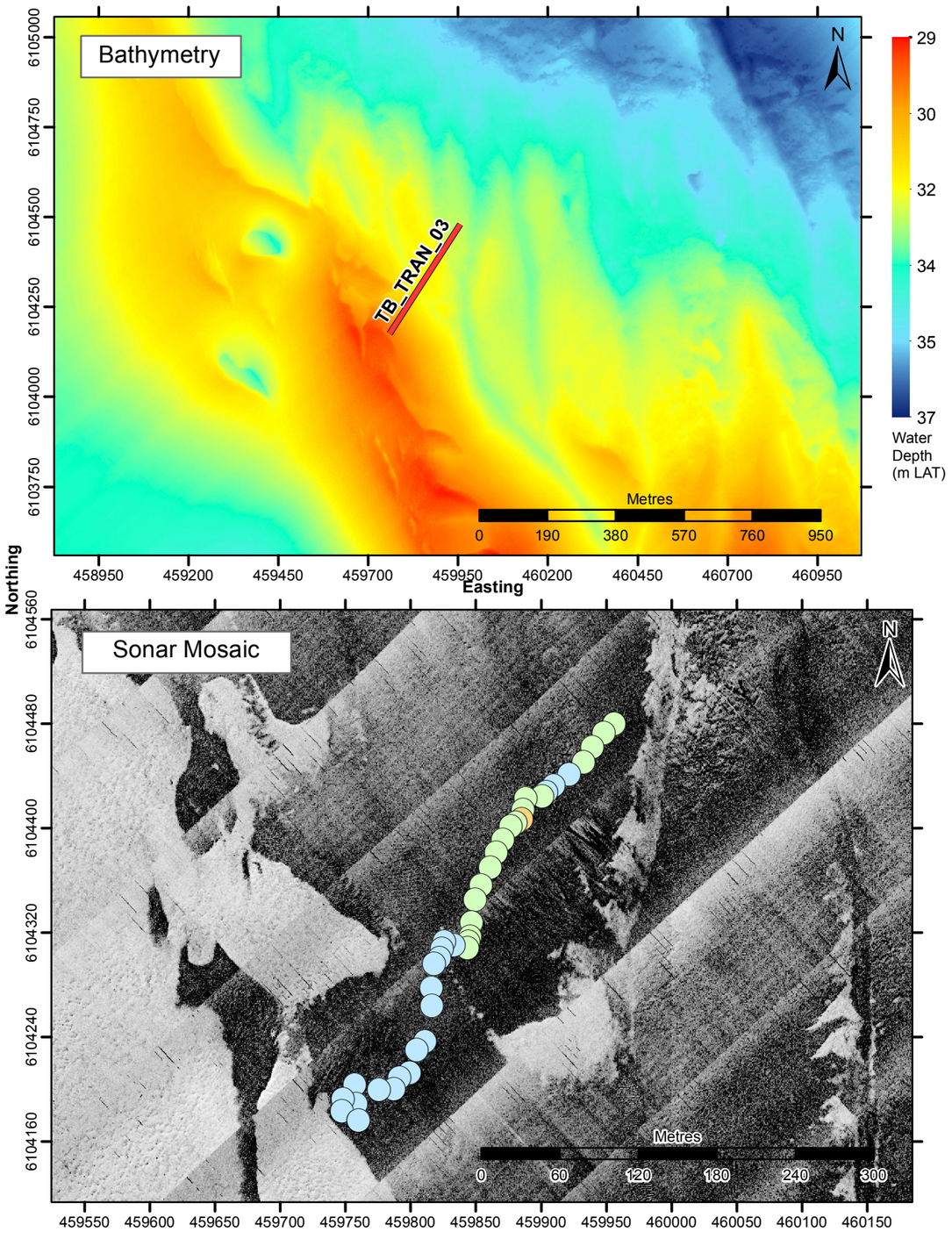
- Transect
- Boulder clay till
- Coarse material and depressions
- Coarse sand
- Fine to medium sand
- Gravelly sand
- Gravelly sand with megaripples
- Silty sand
- Not a 'stony reef'
- Low Resemblance
- Medium Resemblance
- High Resemblance

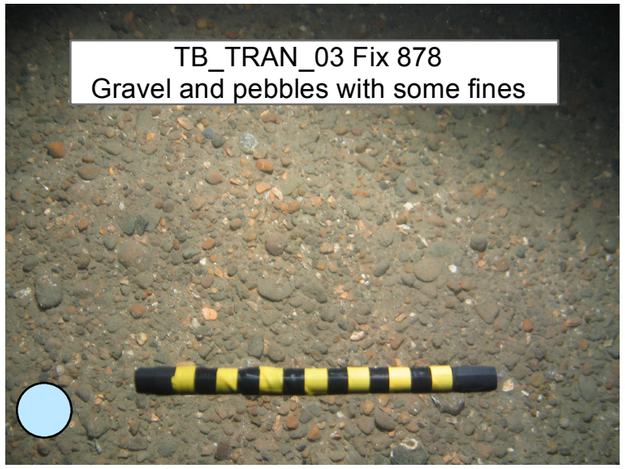
Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E

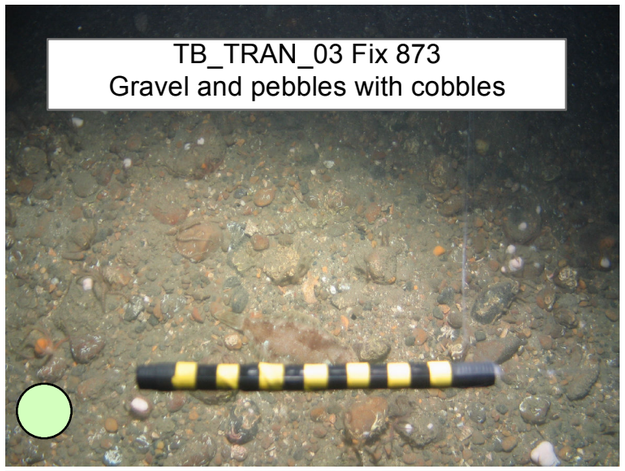


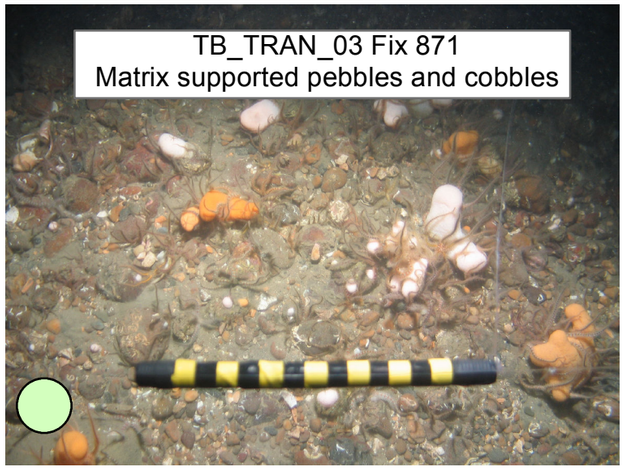
APPENDIX F - STONY REEF ASSESSMENT

Tranche B





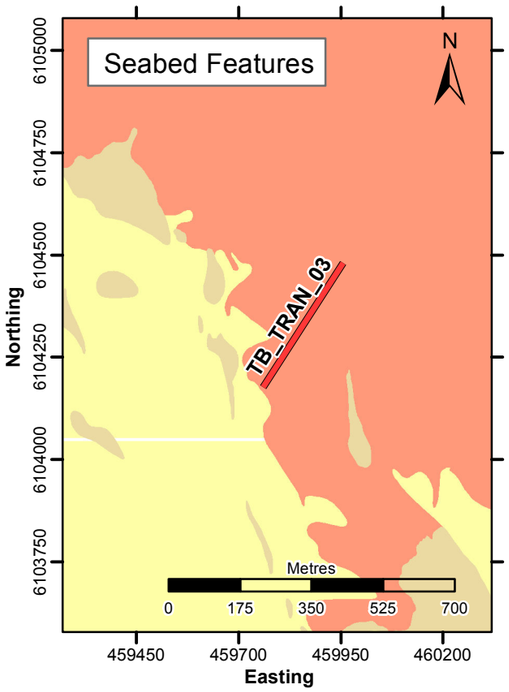




Key

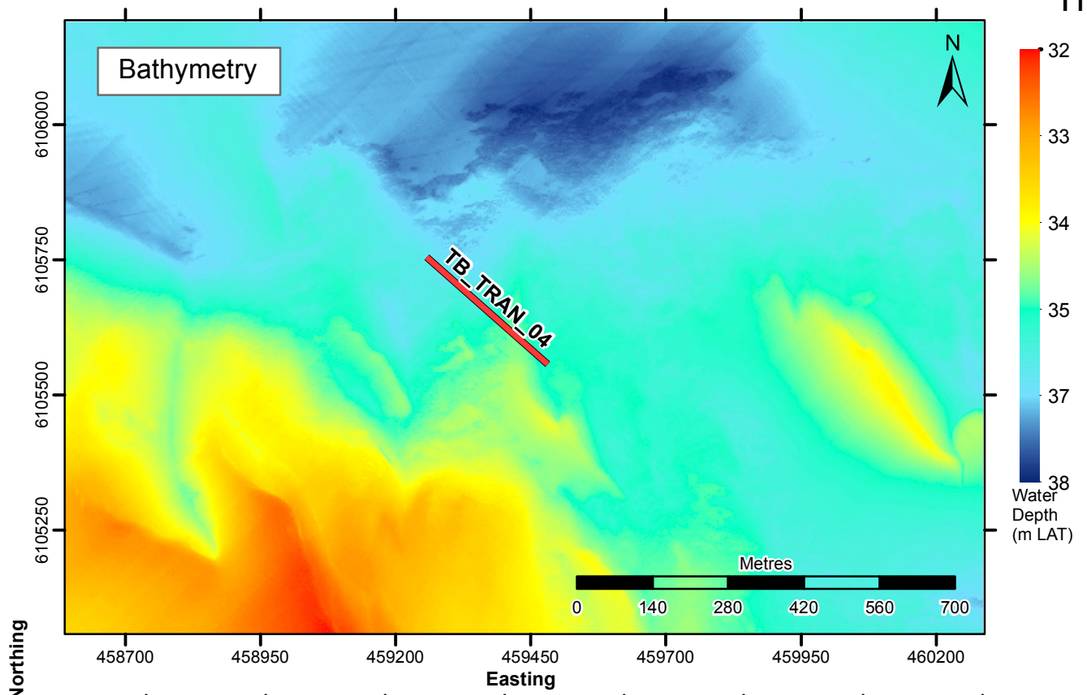
- Transect
- Boulder clay till
- Coarse material and depressions
- Coarse sand
- Fine to medium sand
- Gravelly sand
- Gravelly sand with megaripples
- Silty sand
- Not a 'stony reef'
- Low Resemblance
- Medium Resemblance
- High Resemblance

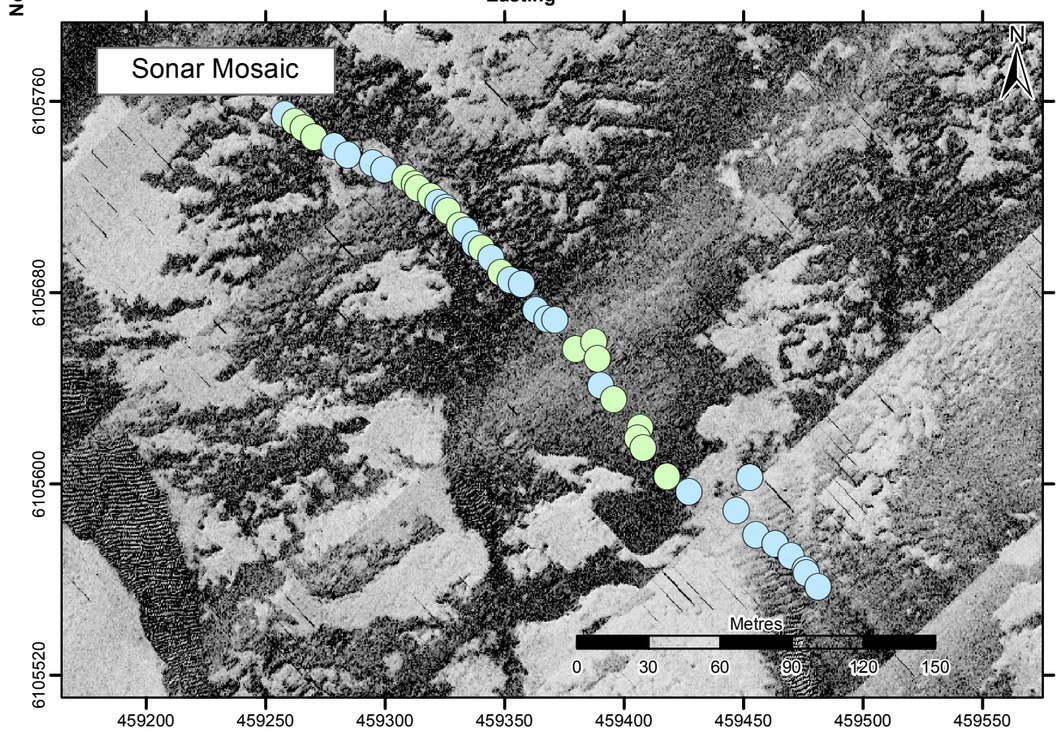
Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E

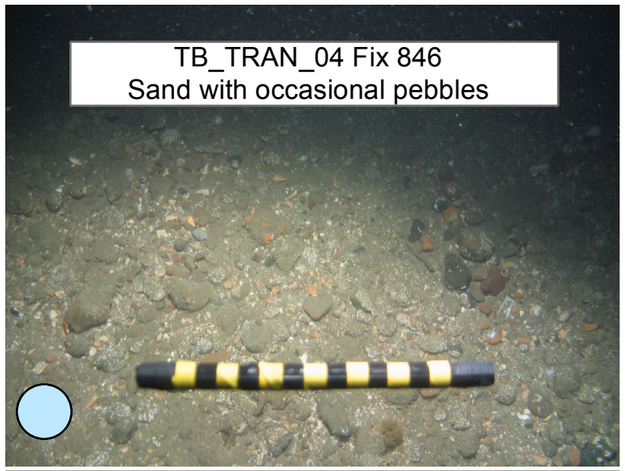


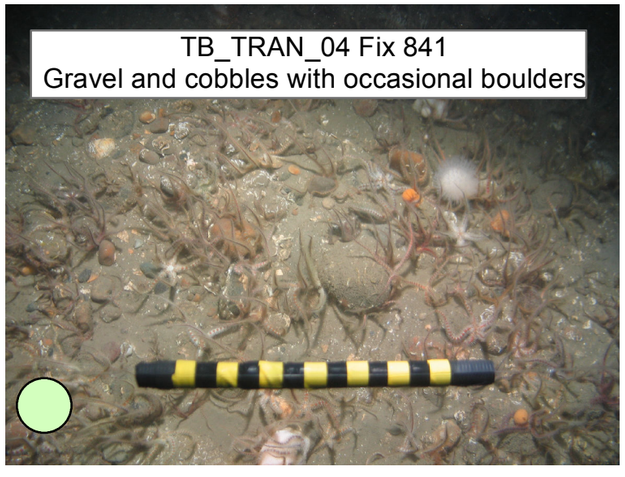
APPENDIX F - STONY REEF ASSESSMENT

Tranche B





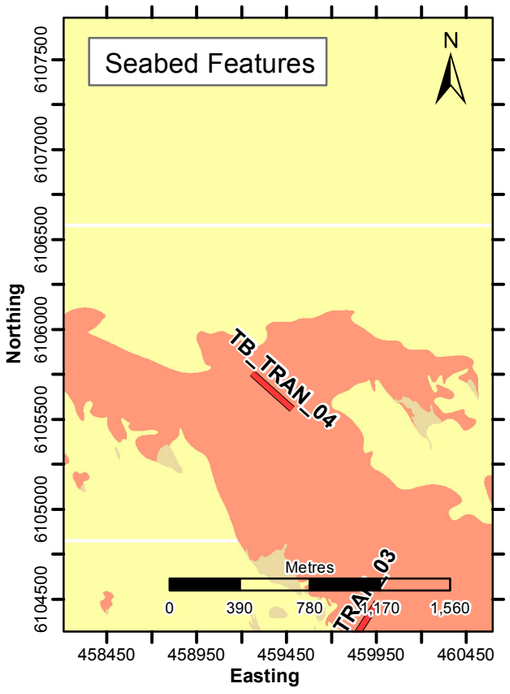




Key

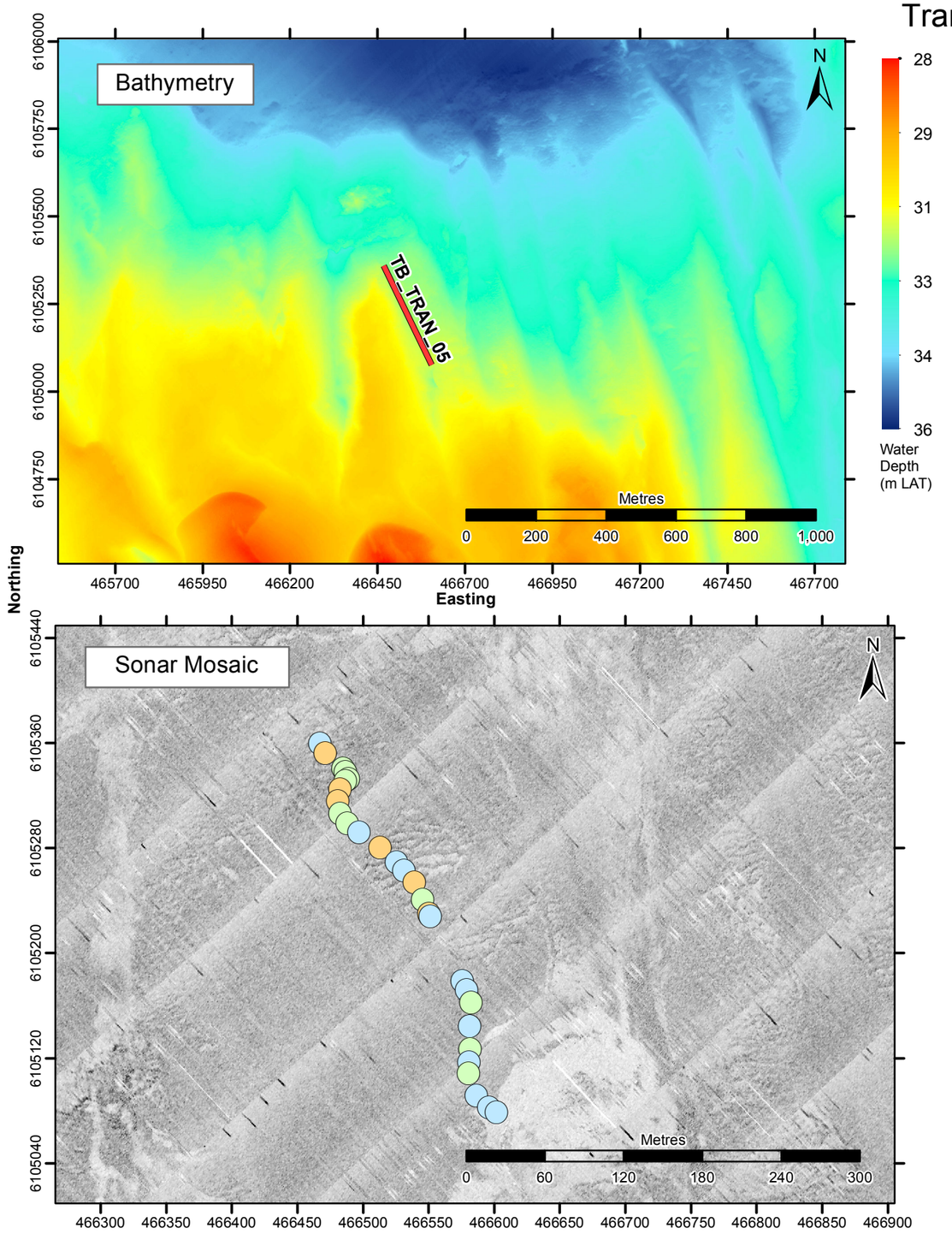
- Transect
- Boulder clay till
- Coarse material and depressions
- Coarse sand
- Fine to medium sand
- Gravelly sand
- Gravelly sand with megaripples
- Silty sand
- Not a 'stony reef'
- Low Resemblance
- Medium Resemblance
- High Resemblance

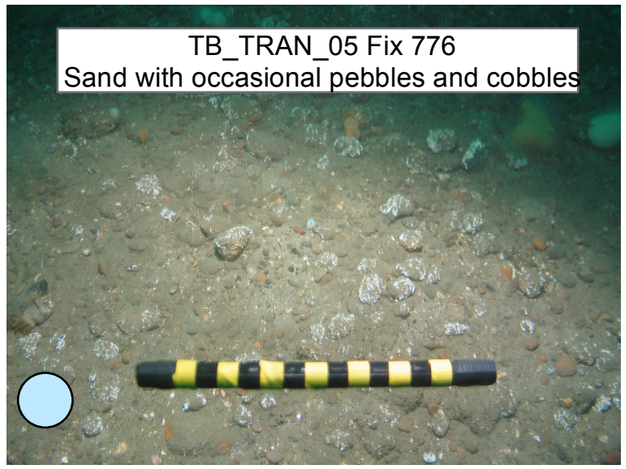
Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E

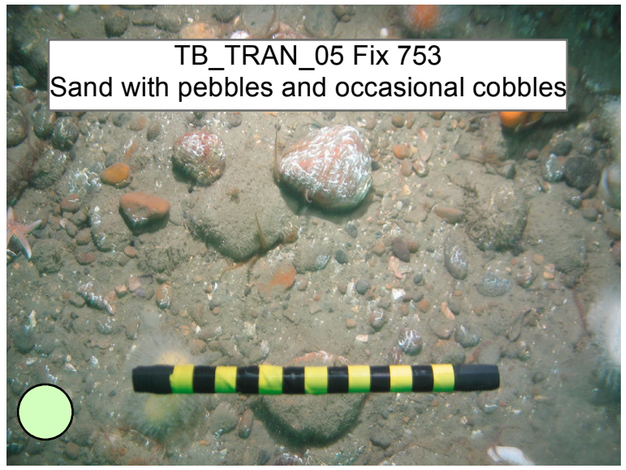


APPENDIX F - STONY REEF ASSESSMENT

Tranche B



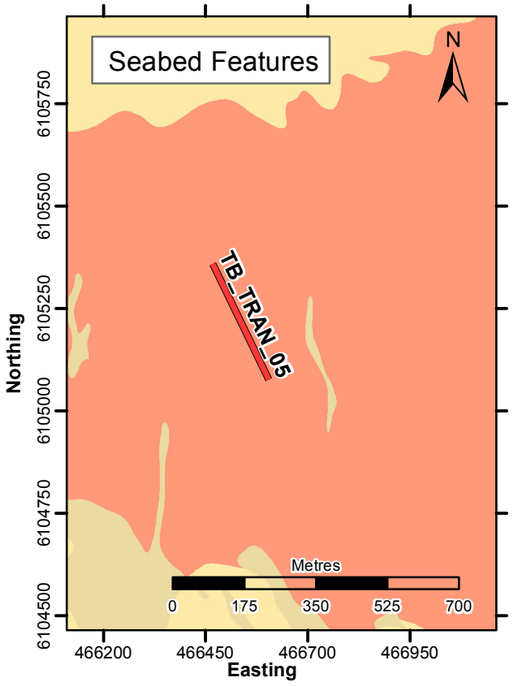




Key

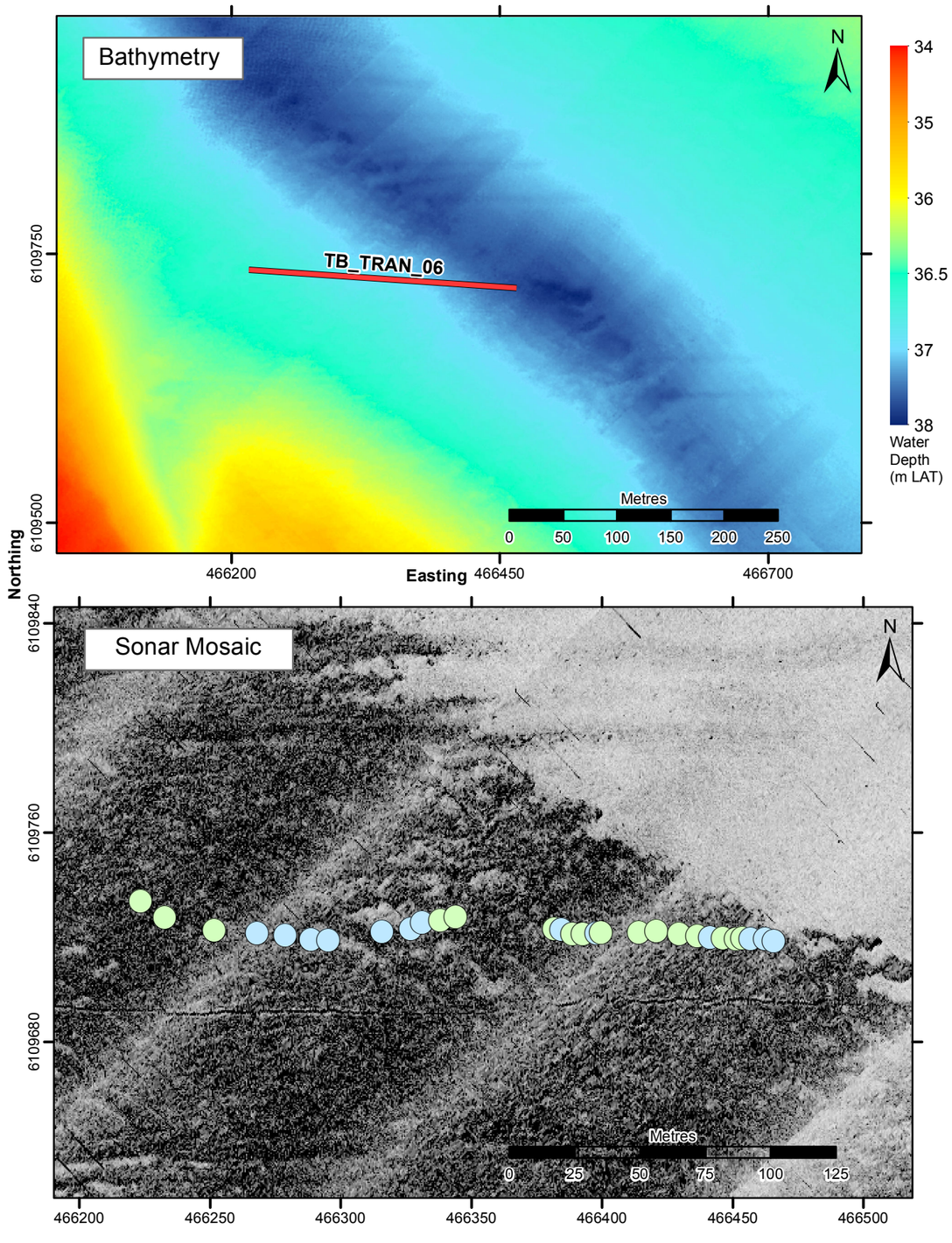
- Transect
- Boulder clay till
- Coarse material and depressions
- Coarse sand
- Fine to medium sand
- Gravelly sand
- Gravelly sand with megaripples
- Silty sand
- Not a 'stony reef'
- Low Resemblance
- Medium Resemblance
- High Resemblance

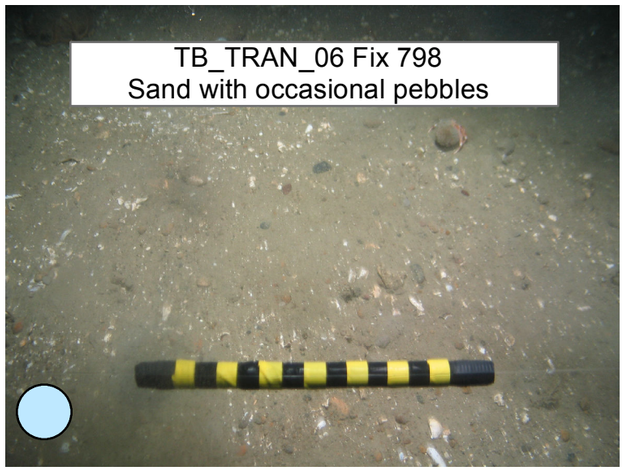
Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E

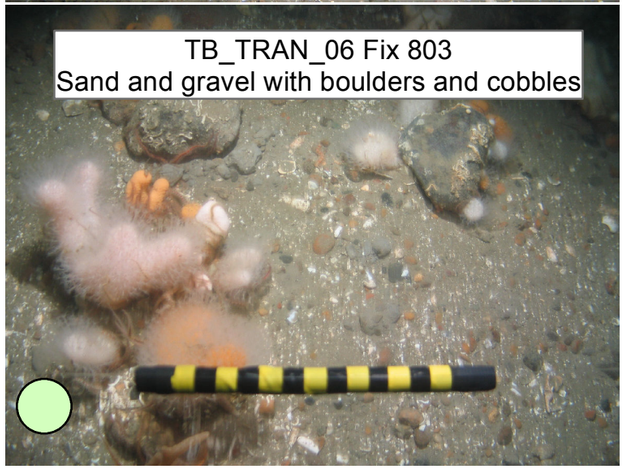


APPENDIX F - STONY REEF ASSESSMENT

Tranche B



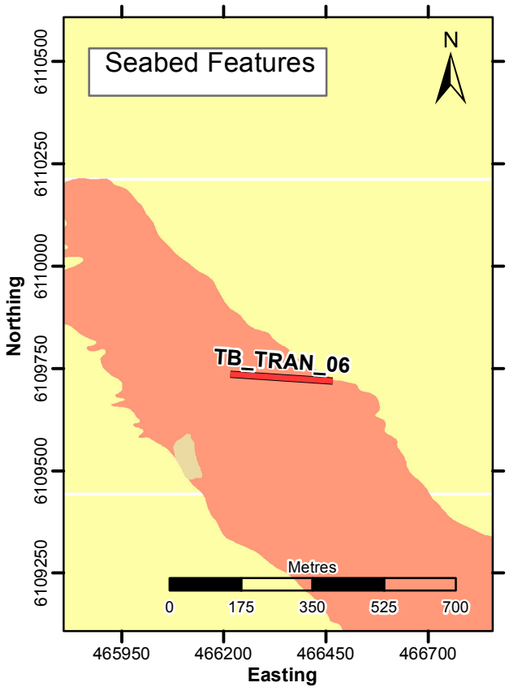




Key

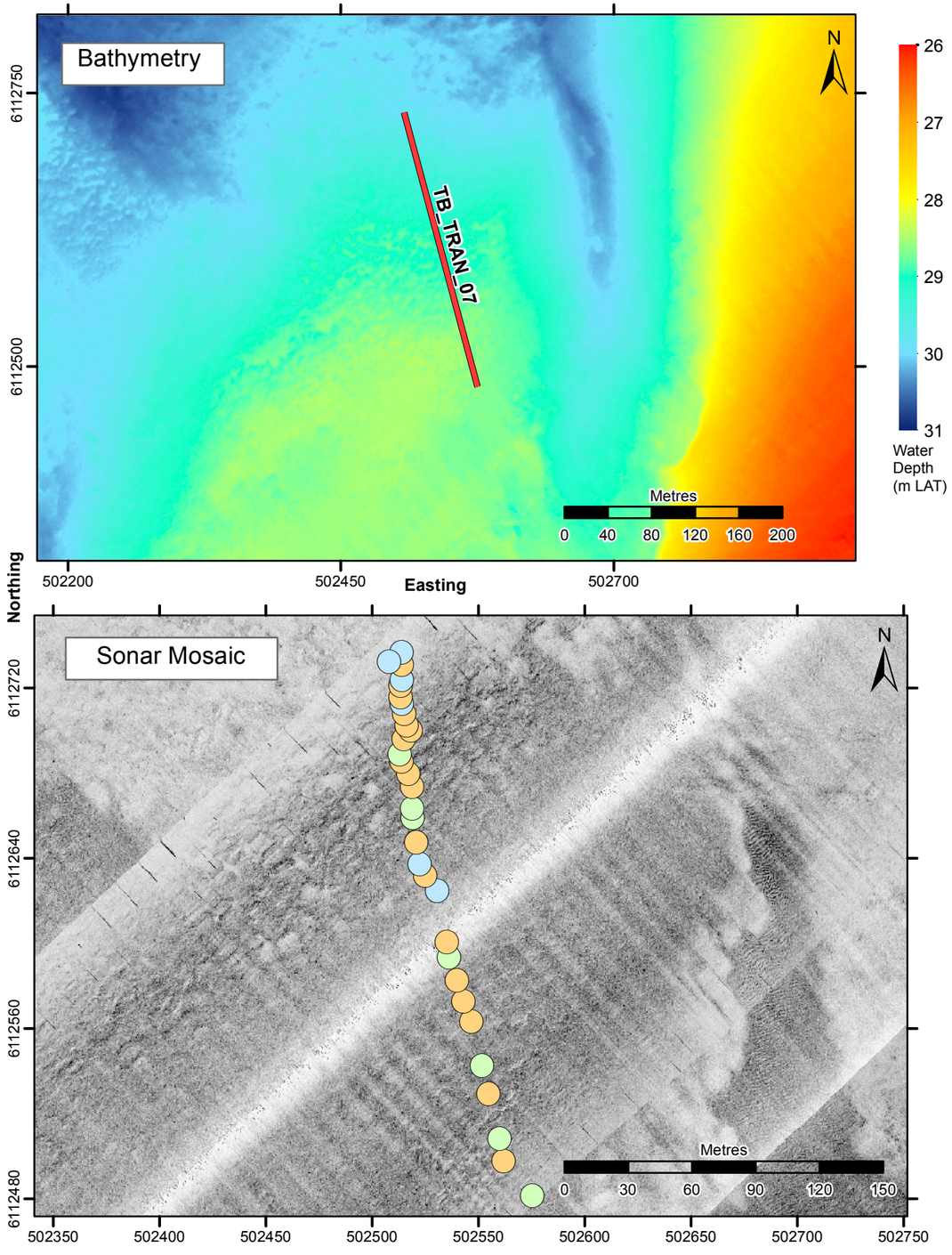
- Transect
- Boulder clay till
- Coarse material and depressions
- Coarse sand
- Fine to medium sand
- Gravelly sand
- Gravelly sand with megaripples
- Silty sand
- Not a 'stony reef'
- Low Resemblance
- Medium Resemblance
- High Resemblance

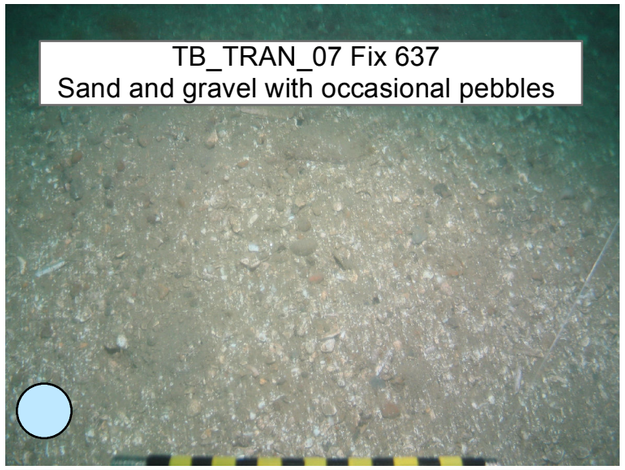
Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E

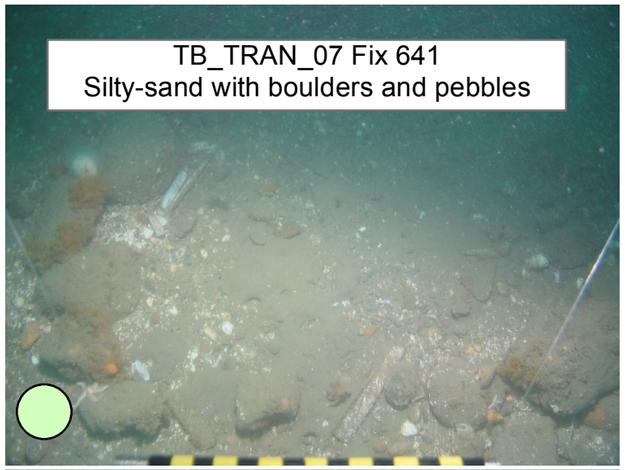


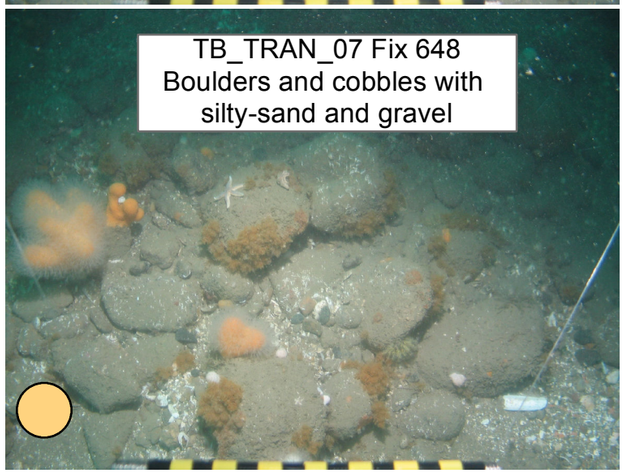
APPENDIX F - STONY REEF ASSESSMENT

Tranche B





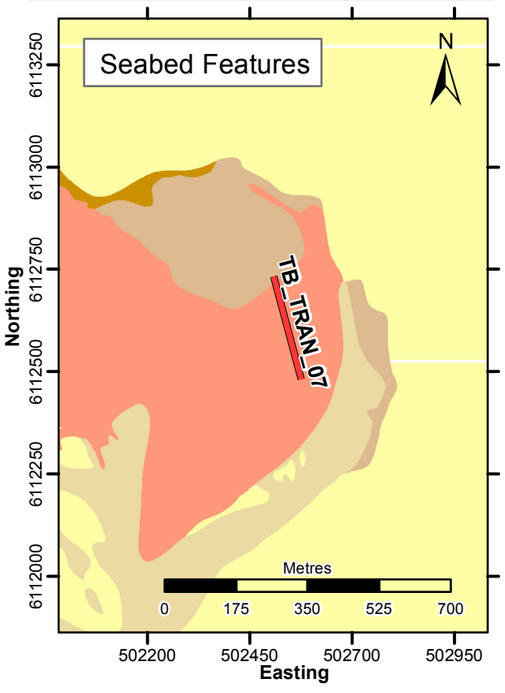




Key

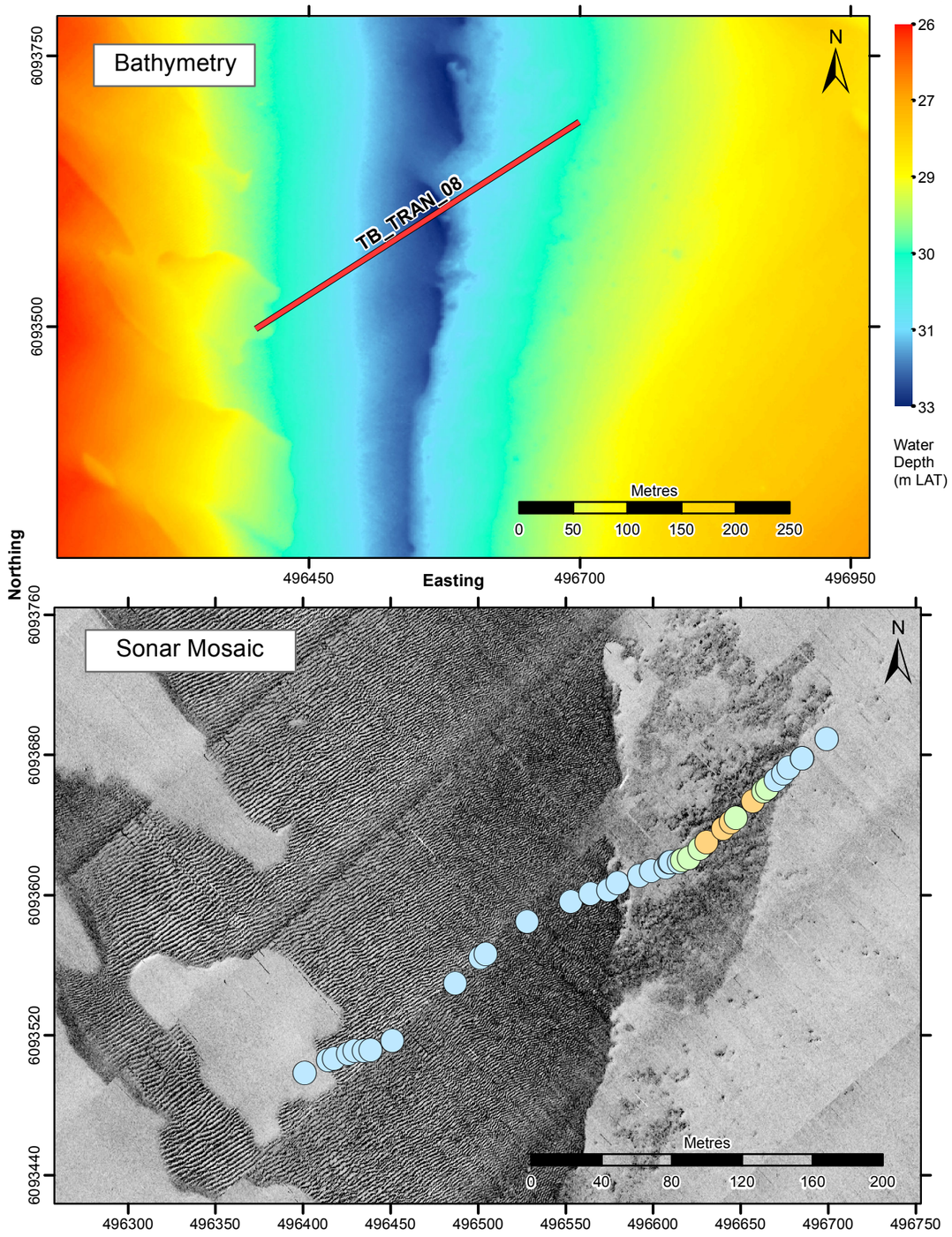
- Transect
- Boulder clay till
- Coarse material and depressions
- Coarse sand
- Fine to medium sand
- Gravelly sand
- Gravelly sand with megaripples
- Silty sand
- Not a 'stony reef'
- Low Resemblance
- Medium Resemblance
- High Resemblance

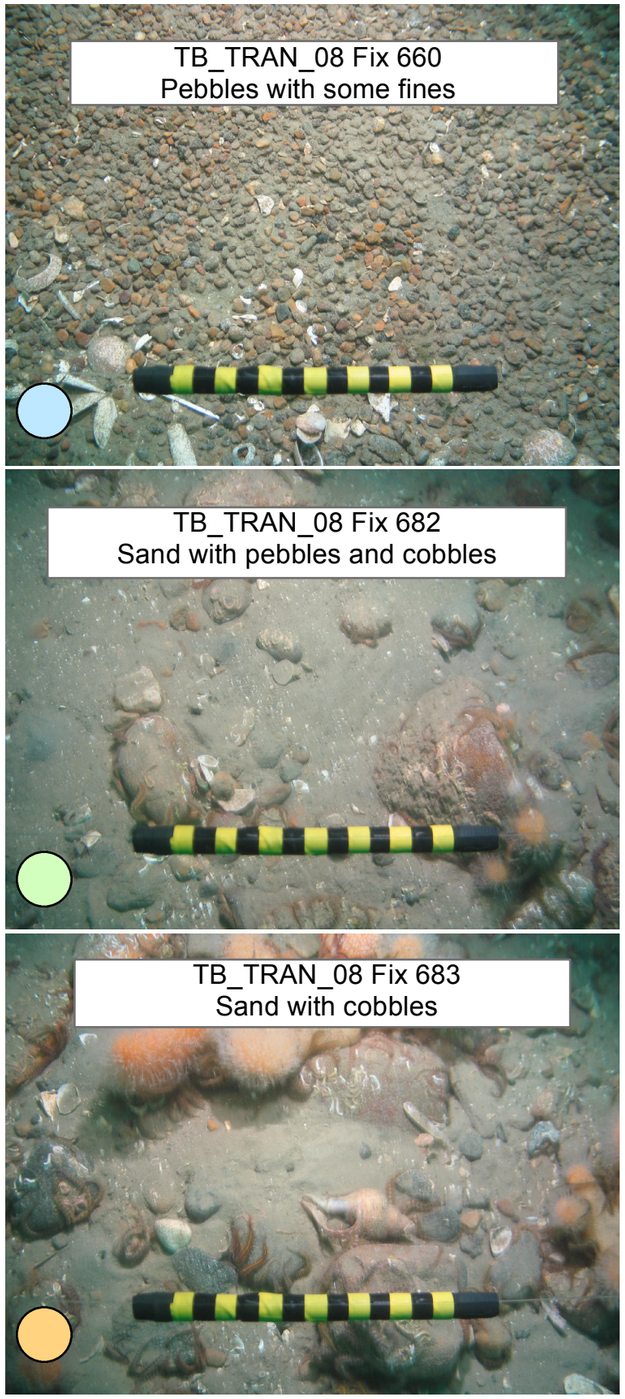
Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E



APPENDIX F - STONY REEF ASSESSMENT

Tranche B

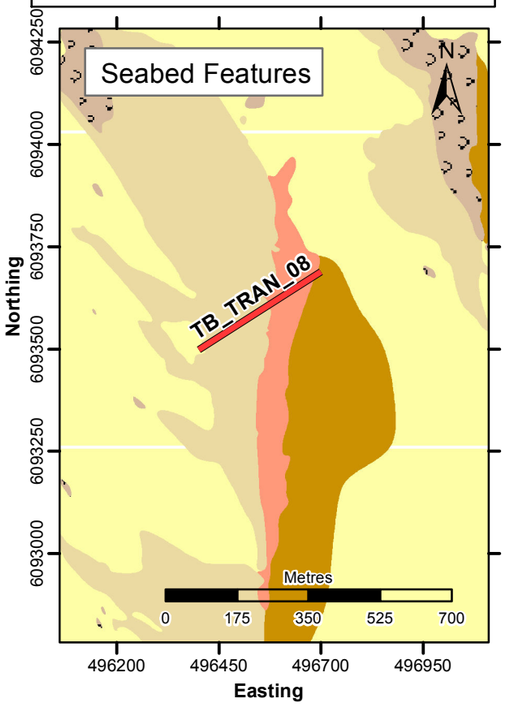




Key

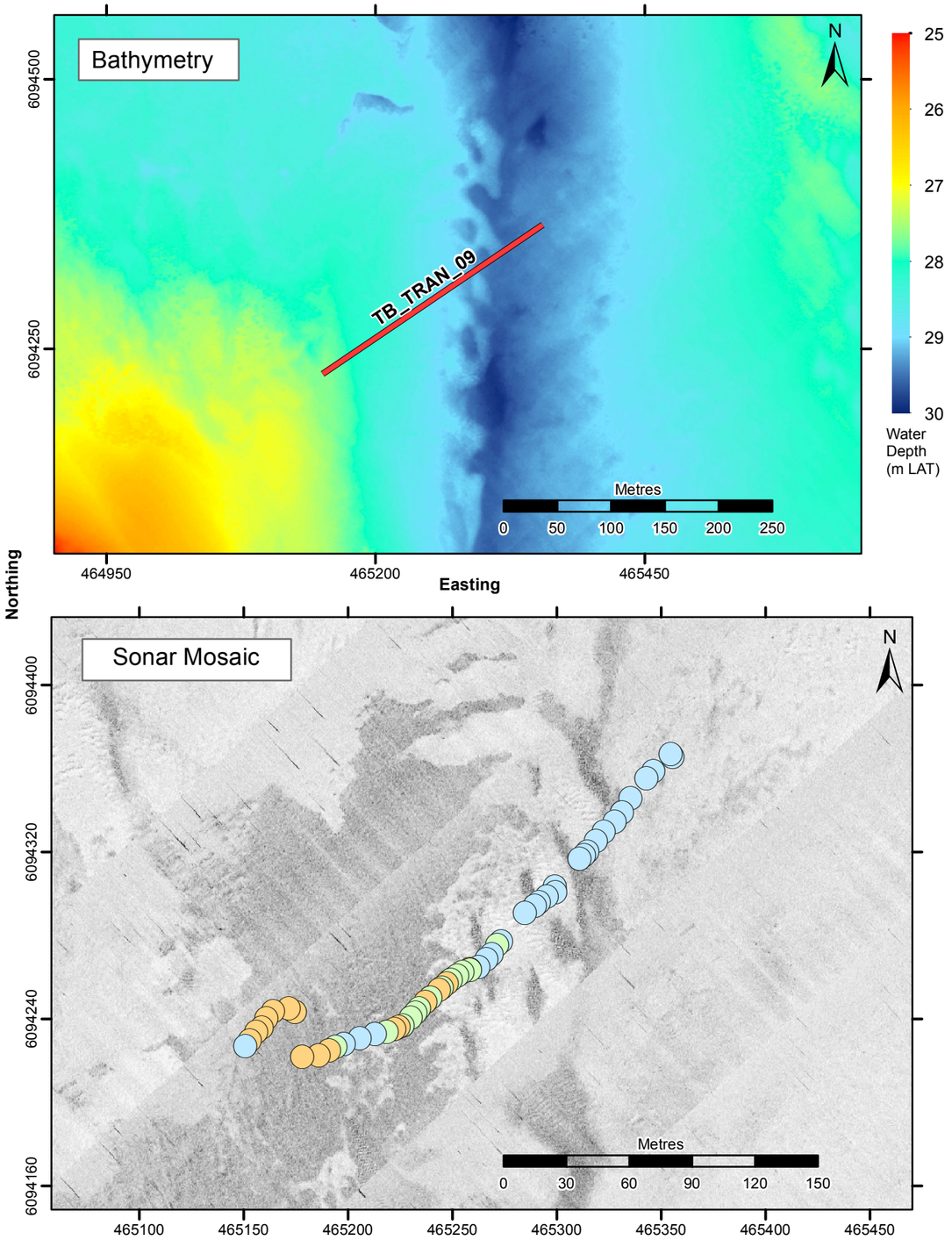
- Transect
- Boulder clay till
- Coarse material and depressions
- Coarse sand
- Fine to medium sand
- Gravelly sand
- Gravelly sand with megaripples
- Silty sand
- Not a 'stony reef'
- Low Resemblance
- Medium Resemblance
- High Resemblance

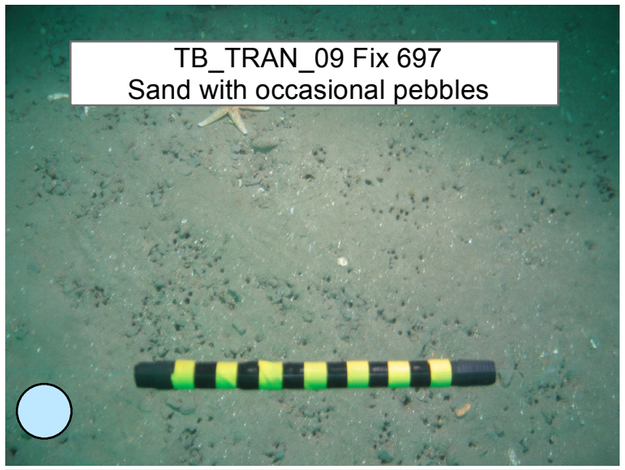
Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E

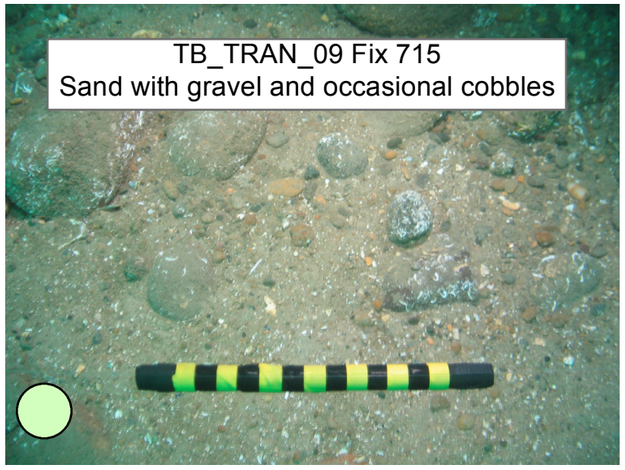


APPENDIX F - STONY REEF ASSESSMENT

Tranche B



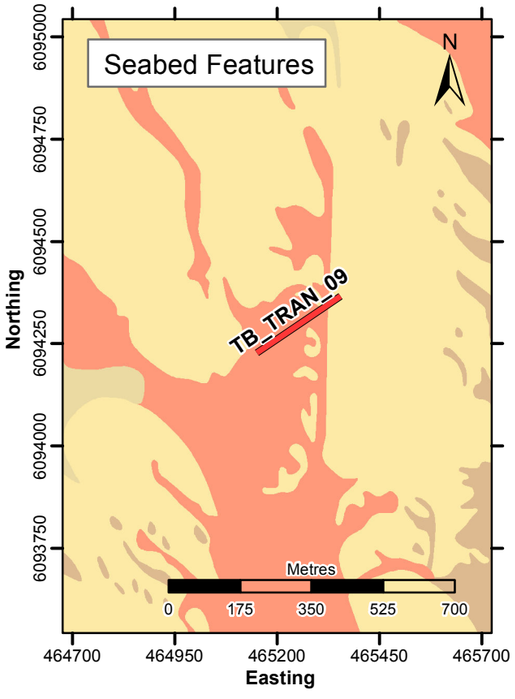




Key

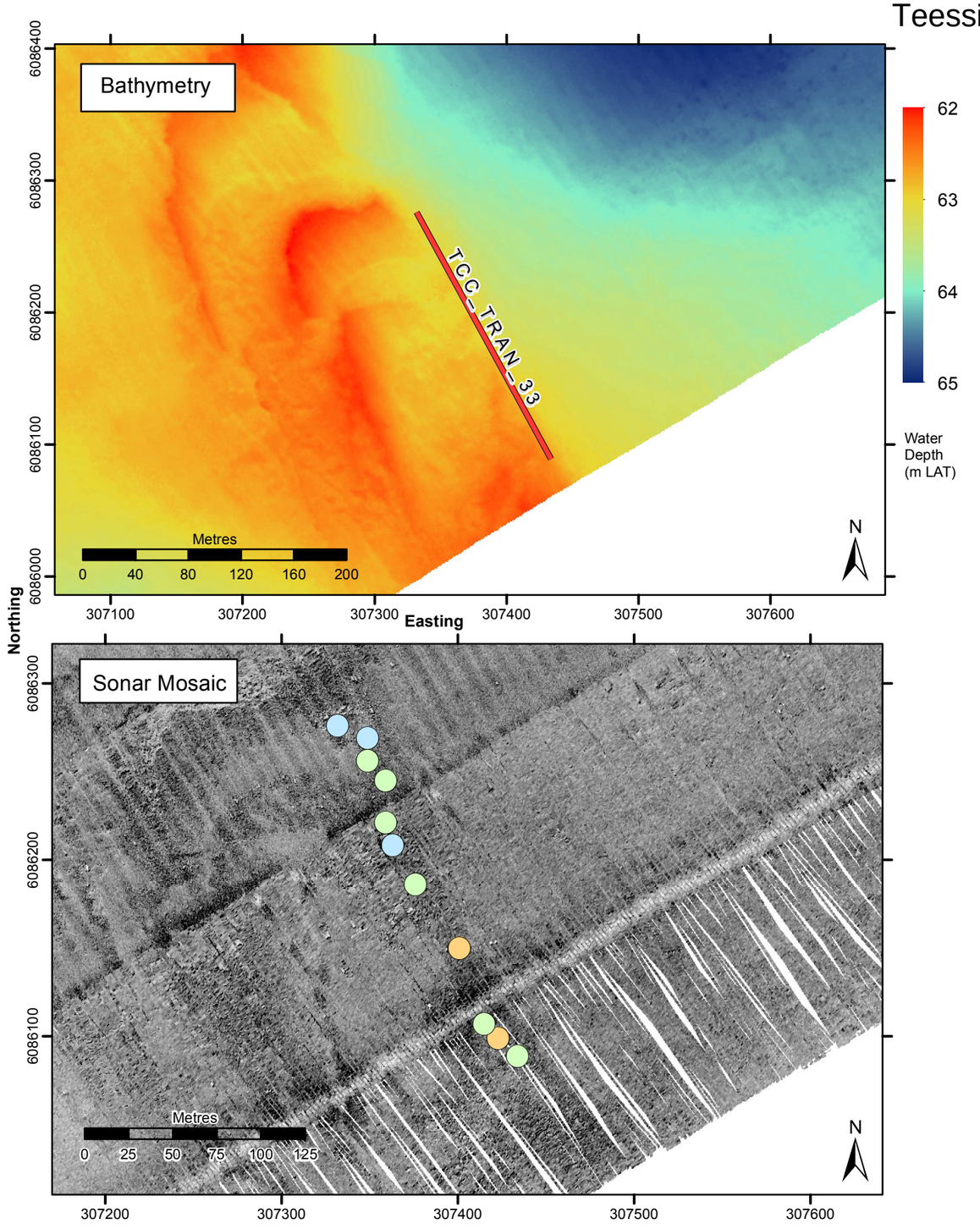
- Transect
- Boulder clay till
- Coarse material and depressions
- Coarse sand
- Fine to medium sand
- Gravelly sand
- Gravelly sand with megaripples
- Silty sand
- Not a 'stony reef'
- Low Resemblance
- Medium Resemblance
- High Resemblance

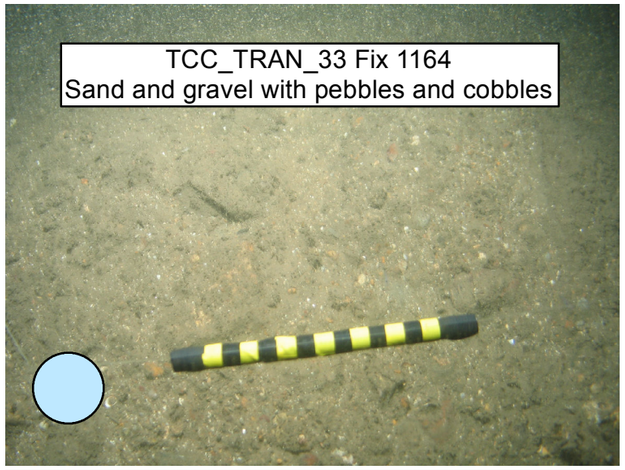
Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E

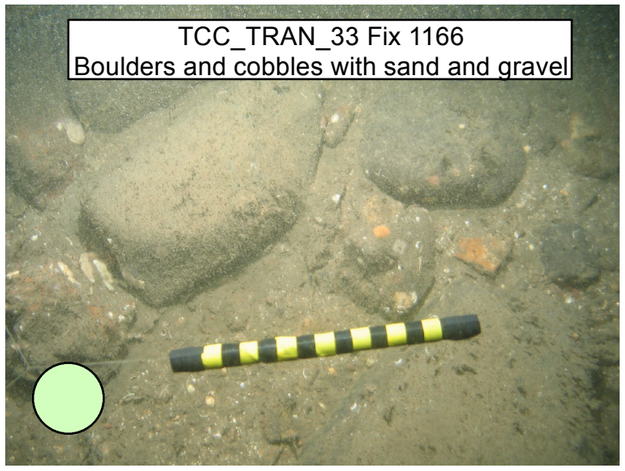


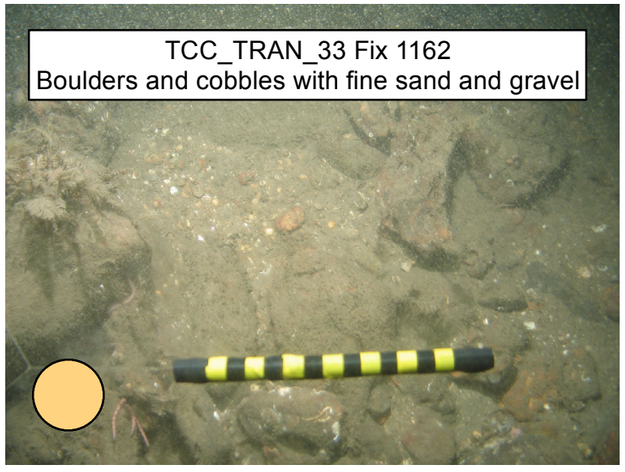
APPENDIX F - STONY REEF ASSESSMENT

Teesside Cable Corridor





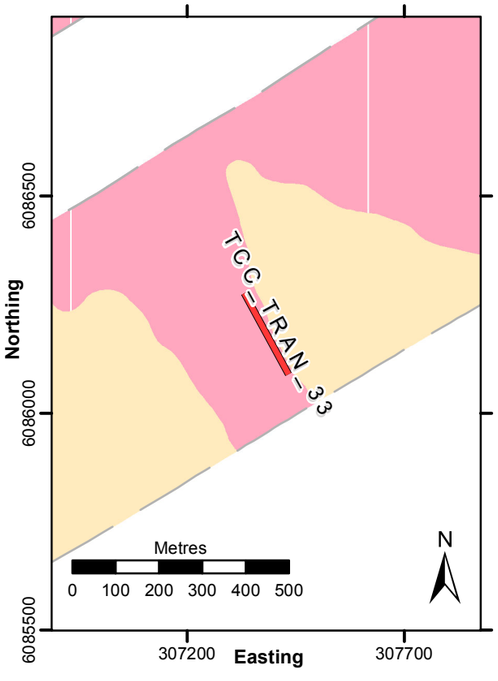




Key

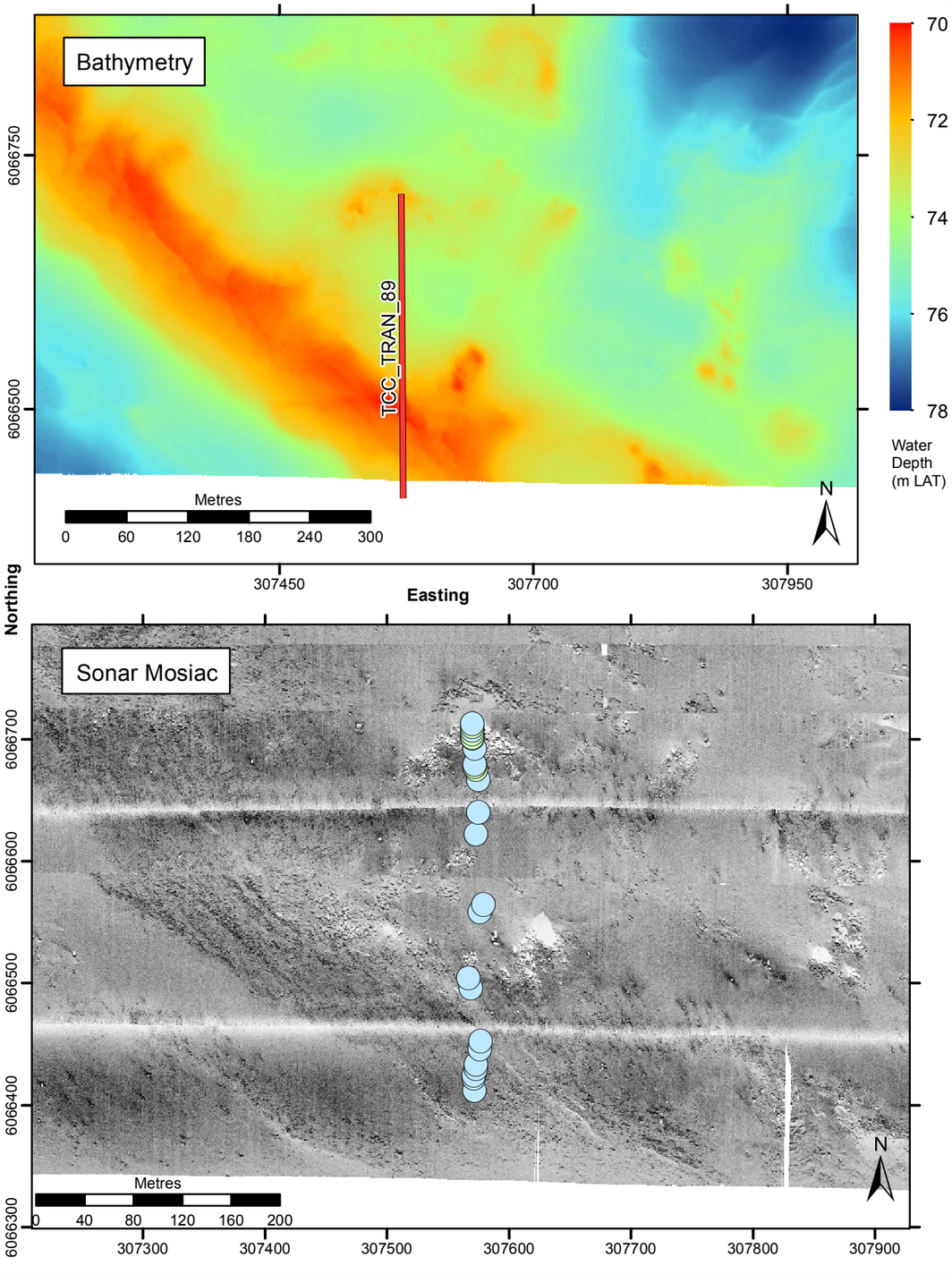
- Transect
- Sand
- Gravelly sand
- Sandy with gravel patches
- Sandy gravel
- Till
- Gravel
- Rock
- Not a 'stony reef'
- Low resemblance
- Medium Resemblance

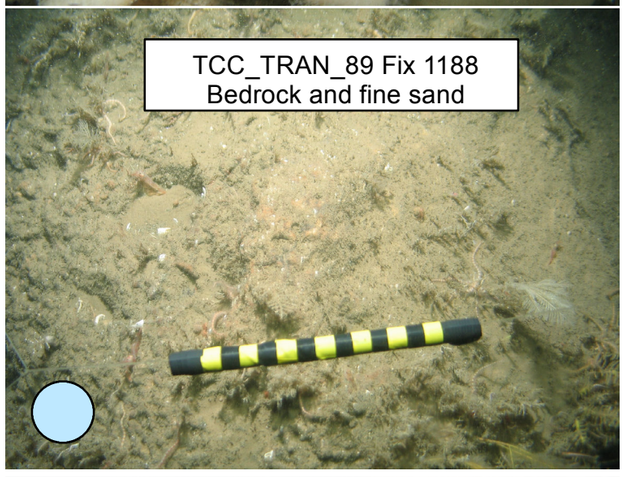
Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E

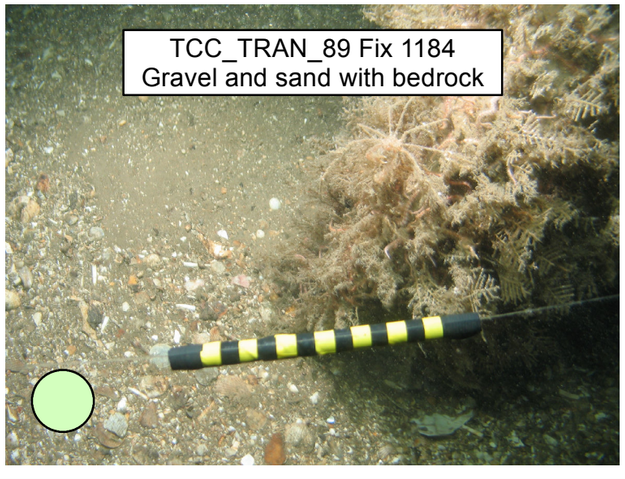


APPENDIX F - STONY REEF ASSESSMENT

Teesside Cable Corridor



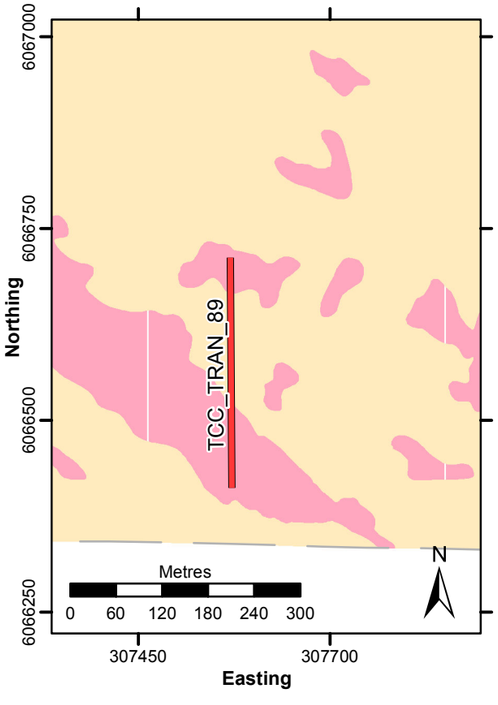




Key

- Transect
- Sand
- Gravelly sand
- Sandy with gravel patches
- Sandy gravel
- Till
- Gravel
- Rock
- Not a 'stony reef'
- Low resemblance
- Medium resemblance

Coordinate System: WGS 1984 UTM Zone 31N
Projection: Transverse Mercator Datum: WGS 1984
Central Meridian: 3.0°E



APPENDIX G – BIOTOPE CLASSIFICATION

STATION TB_01

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	24m	
Zone	Circalittoral	
Block	UKCS 38/29	
Target Location	484374 E	6103128 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 2.0% Gravel 96.4% Sand 1.5% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - *Asterias rubens, Ophiura* sp. **Mollusca** - Bivalvia
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (113), *Owenia fusiformis* (16), *Sigalion mathildae* (10), *Lanice conchilega* (3), *Magelona johnstoni* (3), *Nephtys cirrosa* (3) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (17), *Urothoe poseidonis* (8), *Bathyporeia elegans* (7), *Ampelisca brevicornis* (4), *Diastylis bradyi* (3) **Mollusca** - *Angulus fabula* (5), *Tellimya ferruginosa* (5), *Thracia phaseolina* (3), *Dosinia* juv. (2) **Echinodermata** - *Acrocnida brachiata* (3), *Echinocardium cordatum* (3) **Other - Cnidaria** - Edwardsiidae (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_02

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	23m	
Zone	Circalittoral	
Block	UKCS 38/29	
Target Location	481900 E	6096496 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Moderately Sorted Wentworth: Modified Folk:	 Fine Sand Gravelly Sand 5.7% Gravel 92.6% Sand 1.7% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** – Paguridae **Mollusca** - Bivalvia **Other - Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (93), *Sigalion mathildae* (6), *Owenia fusiformis* (4) **Arthropoda (Crustacea)** – *Bathyporeia guilliamsoniana* (14), *Diastylis bradyi* (2), *Bathyporeia elegans* (2), *Leucothoe incisa* (2) **Mollusca** - *Tellimya ferruginosa* (5), *Angulus fabula* (4), *Ensis* juv. (2) **Echinodermata** - *Echinocardium cordatum* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittora fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_03

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	23m	
Zone	Circalittoral	
Block	UKCS 44/5	
Target Location	489769 E	6093230 N
Estimated sediment type from seabed imagery	Sand with some patches of coarse sediment	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 3.2% Gravel 95.5% Sand 1.3% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Mollusca** - Bivalvia **Echinodermata** - *Asterias rubens*, *Ophiura* sp. **Other - Bioturbation** – Faunal tracks
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (21), *Magelona filiformis* (4), *Sigalion mathildae* (4), *Nephtys* juv. (3) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (18), *Bathyporeia* sp. (9), *Bathyporeia elegans* (8), *Diastylis bradyi* (3), *Urothoe poseidonis* (3), *Perioculodes longimanus* (2) **Mollusca** - *Mactra stultorum* (3), Mactridae juv. (2) **Other - Cnidaria** – Edwardsiidae (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_04

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	23m	
Zone	Circalittoral	
Block	UKCS 39/26	
Target Location	501102 E	6094764 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 3.2% Gravel 95.4% Sand 1.4% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Mollusca** - Bivalvia, Solenidae **Echinodermata** - *Asterias rubens*, Asteroidea, *Astropecten irregularis*, *Ophiura* sp. **Other - Teleostei** - Pleuronectiformes, Soleidae, **Cnidaria** – Actiniaria, *Virgularia mirabilis*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (86), *Magelona filiformis* (4), *Magelona johnstoni* (4), *Owenia fusiformis* (4), *Sigalion mathildae* (4), *Lanice conchilega* (2), *Nephtys* juv. (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (11), *Urothoe poseidonis* (7), *Bathyporeia* sp. (4) **Mollusca** - *Angulus fabula* (6), *Dosinia* juv. (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_05

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	24m	
Zone	Circalittoral	
Block	UKCS 38/29	
Target Location	483484 E	6101847 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Poorly Sorted Wentworth: Modified Folk:	 Medium Sand Gravelly Sand 16.1% Gravel 82.6% Sand 1.4% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Mollusca** - Bivalvia **Echinodermata** - *Ophiura* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (79), *Owenia fusiformis* (12), *Magelona johnstoni* (5), *Sigalion mathildae* (3), *Nephtys* juv. (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (4), *Diastylis bradyi* (3), *Siphonoecetes (Centraloecetes) kroyeranus* (3), *Urothoe elegans* (3), *Bathyporeia elegans* (2), Mactridae juv. (2), *Megaluropus agilis* (2) **Mollusca** - *Ensis* juv. (4) **Echinodermata** - *Echinocyamus pusillus* (4), Echinoidea juv. (3) **Other - Cnidaria** – Edwardsiidae (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** – *Lovenella clausa, Tubularia* sp.

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_06

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	23m	
Zone	Circalittoral	
Block	UKCS 44/4	
Target Location	486752 E	6094283 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Very Poorly Sorted Wentworth: Modified Folk:	 Coarse Sand Gravelly Sand 23.4% Gravel 75.5% Sand 1.1% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** – Paguridae **Mollusca** – Bivalvia **Echinodermata** – *Ophiura* sp. **Other - Bioturbation** – Faunal tracks
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (55), *Magelona johnstoni* (5), *Sigalion mathildae* (4), *Goniada maculata* (2), *Owenia fusiformis* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (11), *Diastylis bradyi* (3), *Siphonoecetes (Centraloecetes) kroyeranus* (2) **Mollusca** - *Ensis* juv. (2) **Echinodermata** - *Echinocyamus pusillus* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_07

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	23m	
Zone	Circalittoral	
Block	UKCS 44/4	
Target Location	480306 E	6092358 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 3.4% Gravel 95.4% Sand 1.1% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Mollusca** - Bivalvia **Echinodermata** - *Asterias rubens*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (76), *Sigalion mathildae* (6), *Owenia fusiformis* (3), *Lanice conchilega* (2), *Magelona johnstoni* (2) **Arthropoda (Crustacea)** - *Urothoe poseidonis* (4), *Urothoe elegans* (3), *Bathyporeia elegans* (2), *Nototropis falcatus* (2), *Urothoe* sp. (2) **Mollusca** - *Tellimya ferruginosa* (3), *Dosinia* juv. (2), *Euspira pulchella* (2) **Echinodermata** - *Echinocyamus pusillus* (4), *Acrocnida brachiata* (3), *Echinocardium cordatum* (3) **Other - Cnidaria** - Edwardsiidae (2), **Phoronida** - *Phoronis* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_08

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	25m	
Zone	Circalittoral	
Block	UKCS 38/30	
Target Location	489400 E	6105950 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.7% Gravel 98.3% Sand 1.0% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Mollusca** - Scaphopoda **Other - Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (125), *Owenia fusiformis* (14), *Magelona filiformis* (3), *Sigalion mathildae* (3), *Goniada maculata* (2), *Lanice conchilega* (2), *Nephtys cirrosa* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (8), *Diastylis bradyi* (6), *Bathyporeia elegans* (5), *Siphonoecetes (Centraloecetes) kroyeranus* (5), *Bathyporeia* sp. (3), *Nototropis falcatus* (2) **Mollusca** - Mactridae juv. (7), *Angulus fabula* (6), *Dosinia* juv. (4), *Ensis* juv. (2) **Echinodermata** - Echinoidea juv. (8) **Other - Phoronida** - *Phoronis* (6)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_09

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	24m	
Zone	Circalittoral	
Block	UKCS 44/5	
Target Location	497153 E	6092481 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 2.5% Gravel 96.2% Sand 1.3% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** -Paguridae **Echinodermata** - *Astropecten irregularis, Ophiura* sp. **Mollusca** - Solenidae **Other -** Teleostei - Pleuronectiformes, Soleidae, **Cnidaria** - *Hydractinia echinata,* **Porifera** - Porifera*,* **Bioturbation** – Faunal tracks and burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (13), *Sigalion mathildae* (7), *Lagis koreni* (3), *Lanice conchilega* (2), *Magelona johnstoni* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (3) **Mollusca** - *Angulus fabula* (9), *Tellimya ferruginosa* (6), *Kurtiella bidentata* (3) **Other - Phoronida** - *Phoronis* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_10

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	29m	
Zone	Circalittoral	
Block	UKCS 38/26	
Target Location	446851 E	6098655 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 1.5% Gravel 97.3% Sand 1.3% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Mollusca** – Bivalvia, Solenidae **Echinodermata** - *Asterias rubens, Astropecten irregularis*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (10), *Lanice conchilega* (4), *Magelona filiformis* (2), *Nephtys* juv. (2) **Arthropoda (Crustacea)** - *Bathyporeia elegans* (2), *Urothoe poseidonis* (2) **Mollusca** - *Angulus fabula* (20), *Ensis* juv. (13)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_11

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	29m	
Zone	Circalittoral	
Block	UKCS 44/2	
Target Location	455520 E	6093366 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.4% Gravel 98.2% Sand 1.4% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Mollusca** - Bivalvia, Solenidae **Bioturbation** – Faunal tracks and burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (120), *Magelona filiformis* (12), *Lanice conchilega* (11), *Magelona johnstoni* (7), *Chaetozone christiei* (5), *Sigalion mathildae* (5) **Arthropoda (Crustacea)** - *Ampelisca brevicornis* (3), *Bathyporeia guilliamsoniana* (3), *Corystes cassivelaunus* (2) **Mollusca** - *Angulus fabula* (30), *Mactridae* juv. (7), *Ensis* juv. (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_12

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	27m	
Zone	Circalittoral	
Block	UKCS 38/28	
Target Location	472422 E	6097946 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Very Poorly Sorted Wentworth: Medium Sand Modified Folk: Gravelly Sand 16.1% Gravel 82.9% Sand 1.0% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - *Asterias rubens*, *Ophiura* sp. **Mollusca** - Bivalvia **Other - Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (31), *Owenia fusiformis* (5), *Nephtys* juv. (3), *Nephtys cirrosa* (3), *Sigalion mathildae* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (17), *Bathyporeia elegans* (10), *Bathyporeia* (4), *Nototropis falcatus* (3) **Mollusca** - *Kurtiella bidentata* (5), Mactridae juv. (4), *Angulus fabula* (3), *Abra* juv. (2), *Dosinia* juv. (2), *Ensis* juv. (2) **Echinodermata** - *Acrocnida brachiata* (5) **Other - Cnidaria** - *Edwardsiidae* (2), **Nemertea** - *Nemertea* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_13

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	26m	
Zone	Circalittoral	
Block	UKCS 38/29	
Target Location	481909 E	6110323 N
Estimated sediment type from seabed imagery	Fine to medium sand with some patches of coarse sediment	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 3.2% Gravel 95.5% Sand 1.3% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Brachyura, Paguridae **Other - Cnidaria** - *Hydractinia echinata* **Bioturbation** – Faunal tracks and burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (100), *Sigalion mathildae* (8), *Magelona filiformis* (7), *Owenia fusiformis* (7), *Magelona johnstoni* (4), *Nephtys* juv. (4), *Chaetozone christiei* (3) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (12), *Urothoe poseidonis* (5), *Bathyporeia* (2), *Bathyporeia elegans* (2), *Leucothoe incisa* (2) **Mollusca** - *Angulus fabula* (13), *Ensis* juv. (4), *Kurtiella bidentata* (3), *Dosinia* juv. (2), Mactridae juv. (2) **Echinodermata** - *Acrocnida brachiata* (8), *Echinocardium cordatum* (4), *Echinocyamus pusillus* (4), *Echinoidea juv.* (3) **Other - Cnidaria** - *Edwardsiidae* (4), **Phoronida** - *Phoronis* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_14

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	29m	
Zone	Circalittoral	
Block	UKCS 38/30	
Target Location	493195 E	6110105 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.3% Gravel 98.4% Sand 1.3% Mud

Biology	
Fauna from seabed imagery	**Arthropoda (Crustacea)** - Paguridae **Echinodermata** - *Asterias rubens*, *Ophiura* sp., **Other – Biotuirbation** – Faunal tracks
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (55), *Lanice conchilega* (10), *Owenia fusiformis* (3), *Magelona johnstoni* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (6), *Urothoe poseidonis* (4), *Diastylis bradyi* (2) **Mollusca** - *Angulus fabula* (5), *Tellimya ferruginosa* (4), *Dosinia* juv. (3), *Ensis* juv. (2), *Euspira pulchella* (2), Mactridae juv. (2) **Echinodermata** - *Echinoidea* juv. (7) **Other - Cnidaria** - *Edwardsiidae* (5), **Phoronida** - *Phoronis* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_15

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	27m	
Zone	Circalittoral	
Block	UKCS 39/26	
Target Location	503391 E	6110814 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 4.0% Gravel 95.1% Sand 0.9% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - *Pagurus* sp. **Echinodermata** - *Asterias rubens*, *Astropecten irregularis* **Other - Teleostei** - *Buglossidium luteum* **Bioturbation** – Faunal tracks
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (12), *Lanice conchilega* (10), *Sigalion mathildae* (5), *Owenia fusiformis* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (5), *Urothoe poseidonis* (3), *Siphonoecetes* (*Centraloecetes*) *kroyeranus* (2), *Synchelidium maculatum* (2) **Mollusca** - Pharidae juv. (5), *Ensis* juv. (3), Mactridae juv. (3), *Dosinia* juv. (2), *Euspira pulchella* (2), *Thracia* juv. (2) **Echinodermata** - *Acrocnida brachiata* (3), *Echinoidea* juv. (2) **Other - Cnidaria** - *Edwardsiidae* (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_16

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	29m	
Zone	Circalittoral	
Block	UKCS 38/26	
Target Location	445732 E	6097606 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Moderately Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 4.3% Gravel 94.2% Sand 1.4% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – *Spirobranchus* sp., polychaete tubes **Mollusca** – Bivalvia, Solenidae **Echinodermata** – Ophiuroidea **Other - Teleostei** - Pleuronectiformes
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (120), *Lanice conchilega* (12), *Magelona filiformis* (5), *Lagis koreni* (3), *Owenia fusiformis* (3), *Chaetozone christiei* (2), *Pholoe baltica* (2) **Arthropoda (Crustacea)** - *Urothoe elegans* (8), *Bathyporeia elegans* (6), *Urothoe poseidonis* (6) **Echinodermata** – *Acrocnida brachiata* (6) **Mollusca** - *Angulus fabula* (6), *Ensis* juv. (6), Mactridae juv. (4), Cardiidae juv. (2), *Kurtiella bidentata* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** – *Lovenella clausa*, *Tubularia*

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_17

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	28m	
Zone	Circalittoral	
Block	UKCS 44/2	
Target Location	453425 E	6093378 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Very Poorly Sorted Wentworth: Medium Sand Modified Folk: Gravelly Sand 16.8% Gravel 81.9% Sand 1.3% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Echinodermata** - Asteroidea
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (98), *Lanice conchilega* (24), *Lagis koreni* (21), *Magelona filiformis* (4), *Eteone longa* (3), *Notomastus latericeus* (3), *Chaetozone christiei* (2), *Goniada maculata* (2) **Arthropoda (Crustacea)** - *Urothoe poseidonis* (9), *Siphonoecetes* (*Centraloecetes*) *kroyeranus* (2) **Mollusca** - *Angulus fabula* (14), *Ensis* juv. (3), *Thracia phaseolina* (3), *Tellimya ferruginosa* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_18

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	28m	
Zone	Circalittoral	
Block	UKCS 38/29	
Target Location	476679 E	6099015 N
Estimated sediment type from seabed imagery	Fine sand with some patches of coarse sediment	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 2.7% Gravel 96.2% Sand 1.1% Mud	

Habitat Type	
JNCC: SS.SSA.CFiSa.ApriBatPo	*Abra prismatica*, *Bathyporeia elegans* and polychaetes in circalittoral fine sand
EUNIS: A5.252	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Mollusca** - Bivalvia, Solenidae **Other - Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (173), *Lagis koreni* (19), *Magelona filiformis* (6), *Owenia fusiformis* (6), *Lanice conchilega* (5), *Sigalion mathildae* (5), *Magelona johnstoni* (3), *Pholoe baltica* (3), *Goniada maculata* (2) **Arthropoda (Crustacea)** - *Urothoe elegans* (4), *Bathyporeia elegans* (3), *Bathyporeia guilliamsoniana* (3), *Diastylis bradyi* (2), *Urothoe poseidonis* (2) **Mollusca** - *Angulus fabula* (6), *Kurtiella bidentata* (5), Mactridae juv. (4), *Ensis* juv. (3), *Abra prismatica* (2), *Tellimya ferruginosa* (2), *Thyasira flexuosa* (2) **Echinodermata** - *Acrocnida brachiata* (6), *Amphiura filiformis* (2), *Echinocyamus pusillus* (2), Echinoidea juv. (2), Ophiuroidea juv. (2) **Other - Cnidaria** - *Edwardsiidae* (4), **Phoronida** - *Phoronis* (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

STATION TB_19

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	26m	
Zone	Circalittoral	
Block	UKCS 39/26	
Target Location	500638 E	6109644 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Poorly Sorted Wentworth: Modified Folk:	 Medium Sand Gravelly Sand 13.8% Gravel 85.0% Sand 1.2% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Echinodermata** – Asteroidea **Other - Cnidaria** - *Hydractinia echinata* **Bioturbation** – Faunal tracks
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (66), *Lanice conchilega* (13), *Owenia fusiformis* (4), *Goniada maculata* (3), *Lagis koreni* (2), *Nephtys* juv. (2) **Arthropoda (Crustacea)** - *Diastylis bradyi* (3), *Bathyporeia* (2), *Bathyporeia guilliamsoniana* (2), *Urothoe poseidonis* (2) **Echinodermata** - Echinoidea juv. (8), *Echinocyamus pusillus* (4) **Other - Cnidaria** - *Edwardsiidae* (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_20

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	26m	
Zone	Circalittoral	
Block	UKCS 38/29	
Target Location	478617 E	6104418 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Very Poorly Sorted Wentworth: Medium Sand Modified Folk: Gravelly Sand 18.8% Gravel 80.2% Sand 0.9% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - *Pagurus* sp. **Echinodermata** - *Asterias rubens, Ophiura* sp., **Other - Cnidaria** - *Hydractinia echinata,* **Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (40), *Sigalion mathildae* (4), *Goniada maculata* (3), *Lagis koreni* (3), *Lanice conchilega* (3), *Pholoe baltica* (3), *Magelona johnstoni* (2), *Nephtys* juv. (2), *Owenia fusiformis* (2) **Arthropoda (Crustacea)** - *Bathyporeia* (2), *Bathyporeia guilliamsoniana* (2) **Mollusca** - *Kurtiella bidentata* (9), Mactridae juv. (2), *Angulus fabula* (2), *Gari fervensis* (2) **Echinodermata** - *Acrocnida brachiata* (16) **Other - Cnidaria** - *Edwardsiidae* (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_21

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	29m	
Zone	Circalittoral	
Block	UKCS 37/30	
Target Location	433801 E	6104934 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 98.8% Sand 1.1% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Mollusca** - Bivalvia, Solenidae **Echinodermata** - *Asterias rubens, Astropecten irregularis* **Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (24), *Nephtys* juv. *(4), Nephtys cirrosa* (4), *Magelona filiformis* (2), *Owenia fusiformis* (2) **Arthropoda (Crustacea**) - *Bathyporeia elegans* (5), *Bathyporeia guilliamsoniana* (2) **Mollusca** - *Thyasira equalils* (65), *Angulus fabula* (4), *Dosinia* juv. (3), *Ensis* juv. (2) **Echinodermata** - *Echinodea* juv. (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_22

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	26m	
Zone	Circalittoral	
Block	UKCS 38/27	
Target Location	457215 E	6096139 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.3% Gravel 98.6% Sand 1.2% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - *Pagurus bernhardus* **Mollusca** - Scaphopoda, Bivalvia, Solenidae **Echinodermata** - *Asterias rubens, Astropecten irregularis* **Other - Teleostei** - *Buglossidium luteum*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (123), *Magelona filiformis* (12), *Sigalion mathildae* (6), *Magelona johnstoni* (5), *Goniada maculata* (4), *Lanice conchilega* (4), *Scolelepis bonnieri* (3), *Lagis koreni* (3) **Arthropoda (Crustacea)** - *Bathyporeia elegans* (5), *Bathyporeia guilliamsoniana* (5), *Pariambus typicus* (2) **Mollusca** - *Angulus fabula* (13), Mactridae juv. (11), *Ensis* juv. (6), *Mactra stultorum* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_23

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	27m	
Zone	Circalittoral	
Block	UKCS 38/30	
Target Location	497527 E	6099600 N
Estimated sediment type from seabed imagery	Fine sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.5% Gravel 98.2% Sand 1.2% Mud

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Aphroditinae, polychaete tubes **Arthropoda (Crustacea)** - Paguridae, Portunidae **Mollusca** –Bivalvia, Solenidae **Echinodermata** - *Astropecten irregularis, Asterias rubens, Ophiura* spp. **Others** - **Teleostei** - *Eutrigla gurnardus,* Pleuronectiformes, Soleidae *Buglossidium luteum,* , **Cnidaria** - *Hydractinia echinata,* **Bioturbation** – Faunal tracks and burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (66), *Lagis koreni* (14), *Sigalion mathildae* (5), *Magelona johnstoni* (2), *Owenia fusiformis* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (6) **Mollusca** - *Angulus fabula* (8), *Tellimya ferruginosa* (4), *Euspira pulchella* (3) **Other - Cnidaria** - Edwardsiidae (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

STATION TB_24

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	28m	
Zone	Circalittoral	
Block	UKCS 38/30	
Target Location	498748 E	6112490 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Poorly Sorted Wentworth: Fine Sand Modified Folk: Gravelly Sand 7.7% Gravel 90.4% Sand 1.9% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Echinodermata** - *Asterias rubens* **Others** – **Teleostei, Bioturbation** – Faunal tracks and burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (73), *Lanice conchilega* (14), *Lagis koreni* (6), *Owenia fusiformis* (5), *Magelona filiformis* (2), *Sigalion mathildae* (2) **Mollusca** - *Kurtiella bidentata* (3), *Ensis* juv. (3), *Tellimya ferruginosa* (2), *Dosinia* juv. (2) **Echinodermata** - Echinoidea juv. (11), *Acrocnida brachiata* (4), Ophiuroidea juv. (3) **Other - Cnidaria** - Edwardsiidae (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_25

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	28m	
Zone	Circalittoral	
Block	UKCS 38/28	
Target Location	470927 E	6096848 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 3.6% Gravel 95.2% Sand 1.3% Mud

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Mollusca** – Bivalvia, Solenidae **Echinodermata** - *Asterias rubens*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (81), *Lanice conchilega* (3), *Magelona filiformis* (3), *Magelona johnstoni* (3), *Owenia fusiformis* (3), *Sigalion mathildae* (4), *Glycinde nordmanni* (2), *Lagis koreni* (2), *Nephtys cirrosa* (2) *Scoloplos (Scoloplos) armiger* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (10), *Bathyporeia elegans* (5), *Bathyporeia* (2) **Mollusca** - *Angulus fabula* (17), *Dosinia* juv. (7), *Gari fervensis* (2) **Echinodermata** - *Echinocyamus pusillus* (3), Ophiuroidea juv. (2) **Other - Phoronida** - *Phoronis* (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

STATION TB_26

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	29m	
Zone	Circalittoral	
Block	UKCS 38/27	
Target Location	459681 E	6096883 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.8% Gravel 97.4% Sand 1.8% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Mollusca** - Bivalvia, Solenidae **Echinodermata** - *Asterias rubens, Astropecten irregularis,* Asteroidea **Other - Porifera**, **Bioturbation** – Faunal tracks
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (18), *Lagis koreni* (12), *Lanice conchilega* (12), *Sigalion mathildae* (6), *Magelona johnstoni* (5), *Magelona filiformis* (4), *Eteone longa* (3) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (4) **Mollusca** - *Angulus fabula* (38), *Ensis* juv. (5), *Thracia phaseolina* (3), Mactridae juv. (3), *Mactra stultorum* (2) **Echinodermata** - Echinodea juv. (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_27

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	28m	
Zone	Circalittoral	
Block	38/30	
Target Location	490582 E	490582 E
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.2% Gravel 98.7% Sand 1.2% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Aphroditinae, *Ophiodromus flexuosus*, polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Mollusca** - Bivalvia, Gastropoda **Other – Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (96), *Sigalion mathildae* (7), *Magelona johnstoni* (3), *Owenia fusiformis* (2), *Nephtys* juv. (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (8), *Diastylis bradyi (*3) **Mollusca** - *Angulus fabula* (13), *Euspira pulchella* (3), *Tellimya ferruginosa* (3), Mactridae juv. (2) **Echinodermata** - Ophiuroidea juv. (2), *Echinocardium cordatum* (2) **Other - Phoronida** - *Phoronis* (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_28

APPENDIX G - BIOTOPE CLASSIFICATION
Tranche B

Physical Environment		
Target Water Depth	29m	
Zone	Circalittoral	
Block	38/27	
Target Location	459154 E	459154 E
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment including patches of gravel and cobbles	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 2.5% Gravel 96.2% Sand 1.3% Mud	

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - *Spirobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** - *Cancer Pagurus,* Paguridae, Portunidae **Mollusca** - Bivalvia, Gastropoda **Echinodermata** - *Asterias rubens, Astropecten irregularis* **Others - Bryozoa** - *Flustra foliacea* sp., **Cnidaria** – *Alcyonium* sp., Sertulariidae, **Porifera** – Porifera, **Bioturbation** – Faunal tracks and burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (58), *Lagis koreni* (7), *Sigalion mathildae* (4), *Lanice conchilega* (4), *Magelona johnstoni* (3), *Owenia fusiformis* (3), *Chaetozone christiei* (2), *Magelona filiformis* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (7), *Leucothoe incisa* (3), *Urothoe poseidonis* (3), *Bathyporeia elegans* (3), *Ampelisca brevicornis* (2), *Liocarcinus* juv. (2) **Mollusca** - *Angula fabula* (11), Mactridae juv. (4), *Ensis* juv. (4), *Dosinia* juv. (3), *Thracia* juv. (2), *Mactra stultorum* (2) **Echinodermata** - Echinodea juv. (4), *Acrocnida brachiata* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

STATION TB_29

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	28m	
Zone	Circalittoral	
Block	38/30	
Target Location	489680 E	489680 E
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 3.9% Gravel 95.2% Sand 0.9% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** – *Pagurus bernhardus* **Mollusca** – Bivalvia, Scaphopoda **Others – Teleostei**, **Porifera** - Porifera
Dominant fauna from biology data	**Annelida (Polychaeta)** – *Spiophanes bombyx* (70), *Sigalion mathildae* (8), *Lanice conchilega* (8), *Owenia fusiformis* (7), *Magelona johnstoni* (3) **Arthropoda (Crustacea)** – *Bathyporeia guilliamsoniana* (7), *Urothoe poseidonis* (5), *Diastylis bradyi* (3), *Leucothoe incisa* (2), *Bathyporeia elegans* (2), *Ampelisca brevicornis* (2) **Mollusca** – *Angulus fabula* (5), *Ensis* juv. (4), *Mactra stultorum* (3), *Dosinia* juv. (3) **Echinodermata** – Echinodea juv. (7), *Acrocnida brachiata* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_30

APPENDIX G - BIOTOPE CLASSIFICATION
Tranche B

Physical Environment		
Target Water Depth	29m	
Zone	Circalittoral	
Block	38/26	
Target Location	438961 E	438961 E
Estimated sediment type from seabed imagery	Sandy gravel, pebbles and cobbles	
PSA	Very Poorly Sorted Wentworth: Modified Folk:	 Very Fine Sand Sandy Gravel 72.1% Gravel 26.7% Sand 1.1% Mud

Habitat Type	
JNCC: SS.SCS.CCS.PomB	*Pomatoceros triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles
EUNIS: A5.141	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - *Spirobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** -Paguridae, Portunidae **Echinodermata** - *Asterias rubens* **Others - Teleostei, Porifera** - Porifera, **Cnidaria** – *Alcyonium* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spirobranchus triqueter* (29), *Spirobranchus* (21), *Pholoe baltica* (8), *Gattyana cirrhosa* (6), *Harmothoe* (6), *Lagis koreni* (5), *Lanice conchilega* (4), *Polycirrus* (4), *Scalibregma inflatum* (4), *Nereimyra punctata* (3), *Owenia fusiformis* (2), *Malmgreniella darbouxi* (2), *Goniada maculata* (2), *Dipolydora caeca* (2), *Spiophanes bombyx* (2) **Arthropoda (Crustacea)** - *Ampelisca diadema* (6), *Ampelisca* (4) **Mollusca** - *Kurtiella bidentata* (155), *Mya* juv. (10), *Gibbula tumida* (6), *Timoclea ovata* (3), *Abra alba* (2) **Echinodermata** - Ophiuroidea juv. (2) **Other - Chordata** - Ascidiacea (2), **Phoronida** - *Phoronis* (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria -** Bougainvilliidae, *Obelia* **Bryozoa -** *Escharella immersa*

STATION TB_31

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Water Depth	27m	
Zone	Circalittoral	
Block	UKCS 38/28	
Location	463059 E	6095433 N
Estimated sediment type from seabed imagery	Coarse sediment including gravel, pebbles and cobbles	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - *Spirobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** - Galatheidae, Paguridae **Echinodermata** - *Asterias rubens*, Asteroidea, Ophiuroidea **Other - Bryozoa –** *Bugula* sp., **Cnidaria** – *Alcyonium* sp., Sertulariidae, **Teleostei** – Gobiidae, **Porifera** - Porifera, **Urochordata** - Ascidiacea
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

STATION TB_32

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Water Depth	28m	
Zone	Circalittoral	
Block	UKCS 38/30	
Location	494690 E	6102945 N
Estimated sediment type from seabed imagery	Sand with patches of dense, coarse sediment	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.3% Gravel 98.6% Sand 1.1% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea) -** Cirripedia **Echinodermata -** Asteroidea, *Astropecten irregularis* **Other - Teleostei** - Pleuronectiformes
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (88), *Magelona johnstoni* (9), *Owenia fusiformis* (5) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (4), *Bathyporeia elegans* (3), *Ampelisca brevicornis* (2) **Mollusca** - *Angulus fabula* (13), Mactridae juv. (6), *Tellimya ferruginosa* (2) **Echinodermata** - Echinoidea juv. (3) **Other - Phonronida** - *Phoronis* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria -** *Tubularia*

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_33

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Water Depth	34m	
Zone	Circalittoral	
Block	UKCS 38/26	
Location	442662 E	6106592 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.2% Gravel 99.5% Sand 1.3% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - *Asterias rubens*, Asteroidea **Other - Cnidaria** - Hydrozoa
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (51), *Lanice conchilega* (3), *Nephtys* juv. (3), *Owenia fusiformis* (3) *Magelona johnstoni* (2), *Sigalion mathildae* (2) **Arthropoda (Crustacea)** - *Urothoe poseidonis* (4), *Bathyporeia elegans* (3), *Corystes cassivelaunus* (2) **Mollusca** - *Angulus fabula* (9), *Ensis* juv. (5), *Abra prismatica* (2), *Cochlodesma praetenue* (2), *Euspira pulchella* (2) **Echinodermata** - Echinoidea juv. (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa.ApriBatPo	*Abra prismatica, Bathyporeia elegans* and polychaetes in circalittoral fine sand
EUNIS: A5.252	

STATION TB_34

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Water Depth	32m	
Zone	Circalittoral	
Block	UKCS 38/26	
Location	447675 E	6106904 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.6% Gravel 97.8% Sand 1.6% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - *Spirobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** - Portunidae **Echinodermata** - *Asterias rubens, Astropecten irregularis* **Other - Cnidaria** – Hydrozoa, **Teleostei** – Pleuronectiformes, **Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Lanice conchilega* (34), *Spiophanes bombyx* (24), *Owenia fusiformis* (8), *Magelona johnstoni* (3), *Glycinde nordmanni* (2), *Notomastus latericeus* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (5), *Urothoe poseidonis* (5) **Mollusca** - *Ensis* juv. (16), *Angulus fabula* (15), *Dosinia* juv. (5), *Tellimya ferruginosa* (3), *Abra* juv. (2), *Mysia undata* (2) **Echinodermata** - *Acrocnida brachiata* (3), *Echinocyamus pusillus* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_35

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	31m	
Zone	Circalittoral	
Block	UKCS 38/27	
Target Location	453312 E	453312 E
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 1.6% Gravel 97.0% Sand 1.4% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - *Astropecten irregularis, ----* *Asterias rubens*, Ophiuroidea, Spatangidae **Other - Teleostei** –Pleuronectiformes, **Cnidaria** - Hydrozoa
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (39), *Lanice conchilega* (31), *+-Lagis koreni* (10), *Owenia fusiformis* (7), *Magelona johnstoni* (4), *Magelona filiformis* (3), *Chaetozone christiei* (2), *Eteone longa* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (9), *Urothoe poseidonis* (2) **Mollusca** - *Angulus fabula* (11), *Ensis* juv. (7), Mactridae juv. (4), *Dosinia* juv. (3), *Abra* juv. (2), *Cylichna cylindracea* (2), *Kurtiella bidentata* (2), *Mysia undata* (2) **Echinodermata** - *Acrocnida brachiata* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa* **Porifera** - *Cliona*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_36

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	31m	
Zone	Circalittoral	
Block	UKCS 38/26	
Target Location	445923 E	445923 E
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Poorly Sorted Wentworth: Modified Folk:	 Fine Sand Gravelly Sand 9.3% Gravel 89.2% Sand 1.5% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - Asteroidea, *Astropecten irregularis* **Other - Cnidaria** – Hydrozoa, **Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (38), *Lanice conchilega* (8), *Owenia fusiformis* (6), *Chaetozone christiei* (2), *Podarkeopsis capensis* (2), *Sigalion mathildae* (2) **Arthropoda (Crustacea)** - *Urothoe poseidonis* (9), *Bathyporeia elegans* (2), *Leucothoe incisa* (2), *Urothoe elegans* (2) **Mollusca** - *Angulus fabula* (14), *Kurtiella bidentata* (6), *Dosinia* juv. (5), *Chamelea striatula* (3), *Arctica islandica* juv. (2), *Thracia phaseolina* (2) **Echinodermata** - Echinoidea juv. (3), *Acrocnida brachiata* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - Bougainvilliidae, *Tubularia*

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_37

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Water Depth	30m	
Zone	Circalittoral	
Block	UKCS 38/28	
Location	473889 E	6110686 N
Estimated sediment type from seabed imagery	Sand with patches of coarse sediment	
PSA	Poorly Sorted Wentworth: Fine Sand Modified Folk: Gravelly Sand 10.1% Gravel 86.1% Sand 3.7% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - *Pagurus bernhardus,* Paguridae **Echinodermata** - *Asterias rubens* **Other - Cnidaria** - *Hydractinia echinata,* **Bioturbation** – Faunal tracks and burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (58), *Owenia fusiformis* (18), *Lanice conchilega* (4), *Magelona filiformis* (2), *Pholoe baltica* (2), *Sigalion mathildae* (2) **Arthropoda (Crustacea)** - *Bathyporeia elegans* (2), *Urothoe elegans* (2), *Urothoe* (2) **Mollusca** - *Ensis* juv. (3), Bivalvia (2), *Cylichna cylindracea* (2), Mactridae juv. (2) **Echinodermata** - *Acrocnida brachiata* (5), Echinoidea juv. (4), Ophiuroidea juv. (2) **Other - Cnidaria** - Edwardsiidae (2), **Phoronida** - *Phoronis* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TB_38

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Water Depth	30m	
Zone	Circalittoral	
Block	UKCS 38/27	
Location	453305 E	6105519 N
Estimated sediment type from seabed imagery	Fine sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 1.7% Gravel 96.7% Sand 1.6% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - *Cancer pagurus, Corystes cassivelanus* **Echinodermata -** *Asterias rubens,* Asteroidea, *Astropecten irregularis* **Other - Cnidaria -** Hydrozoa, **Teleostei** - Gobiidae, Pleuronectiformes
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (62), *Lanice conchilega* (15), *Owenia fusiformis* (11), *Goniada maculata* (8), *Lagis koreni* (5), *Nephtys* juv. (4), *Sigalion mathildae* (4), *Magelona filiformis* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (4), *Bathyporeia elegans* (3) **Mollusca** - *Angulus fabula* (15), *Ensis* juv. (4), *Cylichna cylindracea* (3), *Abra prismatica* (2), *Chamelea striatula* (2), *Dosinia* juv. (2), *Ensis ensis* (2) **Echinodermata** - *Echinocyamus pusillus* (2), Echinoidea juv. (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa.ApriBatPo	*Abra prismatica, Bathyporeia elegans* and polychaetes in circalittoral fine sand
EUNIS: A5.252	

STATION TB_39

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Water Depth	31m	
Zone	Circalittoral	
Block	UKCS 38/26	
Location	439328 E	6103252 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 98.7% Sand 1.2% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - Asteroidea
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (45), *Owenia fusiformis* (4), *Sigalion mathildae* (4), *Goniada maculata* (3), *Nephtys cirrosa* (3), *Nephtys* juv. (2) **Arthropoda (Crustacea)** - *Bathyporeia elegans* (3), *Bathyporeia guilliamsoniana* (2) **Mollusca** - *Angulus fabula* (5), *Dosinia* juv. (3), *Kurtiella bidentata* (2), Mactridae juv. (2) **Echinodermata** - Echinoidea juv. (9)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_40

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Water Depth	32m	
Zone	Circalittoral	
Block	UKCS 38/28	
Location	463424 E	6107105 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.4% Gravel 98.2% Sand 1.3% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - Asteroidea
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (21), *Owenia fusiformis* (10), *Lagis koreni* (4), *Magelona johnstoni* (4), *Sigalion mathildae* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (5), *Bathyporeia elegans* (2) **Mollusca** - *Ensis* juv. (13), *Angulus fabula* (6), *Abra prismatica* (3), *Abra* juv. (2), *Phaxas pellucidus* (2) **Echinodermata** - Echinoidea juv. (7)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa.ApriBatPo	*Abra prismatica, Bathyporeia elegans* and polychaetes in circalittoral fine sand
EUNIS: A5.252	

STATION TB_41

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	33m	
Zone	Circalittoral	
Block	UKCS 38/26	
Location	443762 E	6106432 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.2% Gravel 98.8% Sand 1.0% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - *Spirobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Echinodermata** - *Asterias rubens, Astropecten irregularis*, Asteroidea **Other – Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (75), *Nephtys* juv. (6), *Magelona johnstoni* (4), *Chaetozone christiei* (3), *Lanice conchilega* (3), *Ophelia borealis* (2), *Owenia fusiformis* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (7), *Bathyporeia* (2), *Urothoe poseidonis* (2) **Mollusca** - *Angulus fabula (*7), *Ensis* juv. (2) **Echinodermata** - Echinoidea juv. (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_42

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	32m	
Zone	Circalittoral	
Block	UKCS 38/26	
Location	445443 E	6106978 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 1.3% Gravel 97.1% Sand 1.6% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - *Lanice conchilega,* Polychaete tubes **Echinodermata** - *Asterias rubens, Astropecten irregularis,* Asteroidea
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (39), *Lanice conchilega* (10), *Lagis koreni* (4), *Owenia fusiformis* (4), *Magelona johnstoni* (2) **Arthropoda (Crustacea)** - *Urothoe poseidonis* (3) **Mollusca** - *Angulus fabula* (29), *Ensis* juv. (9) **Echinodermata** - Echinoidea juv. (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Clytia hemisphaerica*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_43

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	34m	
Zone	Circalittoral	
Block	38/28	
Target Location	466790 E	466790 E
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.8% Gravel 97.8% Sand 1.4% Mud

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, **Mollusca** - Bivalvia **Echinodermata** - *Asterias rubens, Astropecten irregularis*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (26), *Lanice conchilega* (21), *Lagis koreni* (14), *Owenia fusiformis* (8), *Poecilochaetus serpens* (3), *Sigalion mathildae* (3), *Goniada maculata* (2), *Magelona filiformis* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (3) **Mollusca** - *Angulus fabula* (12), *Ensis* juv. (9), *Dosinia juv.* (5), *Cylichna cylindracea* (4), *Abra prismatica* (3), *Phaxas pellucidus* (3), *Abra* juv. (2), *Mysia undata* (2) **Echinodermata** - Echinoidea juv. (5), Ophiuroidea juv. (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

STATION TB_44

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	33m	
Zone	Circalittoral	
Block	38/27	
Target Location	459561 E	459561 E
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.3% Gravel 98.4% Sand 1.3% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** -Paguridae*, Corystes cassivelaunus* **Echinodermata** - *Astropecten irregularis* **Other** - **Teleostei** - *Buglossidium luteum*, **Cnidaria** - *Hydractinia echinata,*, **Bioturbation** – Faunal tracks and burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (44), *Owenia fusiformis* (8), *Magelona filiformis* (3), *Goniada maculata* (2), *Nephtys* juv. (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (6), *Bathyporeia elegans* (3) **Mollusca** - *Angulus fabula* (16), *Ensis* juv. (7), *Dosinia* juv. (6), *Abra prismatica* (4), *Abra* juv. (2), *Mactra stultorum* (2), *Thracia phaseolina* (2) **Echinodermata** - Echinoidea juv. (29)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_45

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	32m	
Zone	Circalittoral	
Block	38/28	
Target Location	465452 E	465452 E
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.9% Gravel 98.0% Sand 1.1% Mud

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - *Corystes cassivelaunus,* Portunidae **Echinodermata** - *Asterias rubens, Astropecten irregularis*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (58), *Owenia fusiformis* (5), *Lagis koreni* (3), *Magelona filiformis* (3), *Goniada maculata* (2), *Lanice conchilega* (2), *Magelona johnstoni* (2), *Sigalion mathildae* (2) **Arthropoda (Crustacea)** - *Bathyporeia elegans* (6), *Bathyporeia guilliamsoniana* (3), *Corystes cassivelaunus* (2) **Mollusca** - *Angulus fabula* (18), *Ensis* juv. (12), *Abra* juv. (4), Mactridae juv. (4), *Cylichna cylindracea* (3), *Dosinia* juv. (3), *Kurtiella bidentata* (3), Cardiidae juv. (2), *Timoclea ovata* (2) **Echinodermata** - Echinoidea juv. (36), *Echinocyamus pusillus* (3), Ophiuroidea juv. (3), *Acrocnida brachiata* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

STATION TB_46

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	31m	
Zone	Circalittoral	
Block	37/30	
Target Location	435157 E	435157 E
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.9% Gravel 97.9% Sand 1.2% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Mollusca** - Bivalvia **Echinodermata** - Ophiuroidea, *Asterias rubens, Astropecten irregularis*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (35), *Owenia fusiformis* (4), *Nephtys* juv. (7), *Goniada maculata* (3), *Sigalion mathildae* (3) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (3), *Bathyporeia elegans* (2), *Urothoe poseidonis* (2) **Mollusca** - *Angulus fabula* (7), *Dosinia* juv. (4), *Abra prismatica* (3), *Ensis* juv. (3), *Chamelea striatula* (2), *Cochlodesma praetenue* (2), *Thracia* juv. (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TB_47

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	32m	
Zone	Circalittoral	
Block	38/28	
Target Location	466494 E	466494 E
Estimated sediment type from seabed imagery	Sand with gravel, cobbles and occasional boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - *Spirobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Mollusca** – Bivalvia, Gastropoda **Echinodermata** - *Echninus esculentus, Ophiothrix fragilis,* Ophiurae, Ophiuroidea, *Asterias rubens,* Asteroidea **Other - Bryozoa** *Flustra foliacea,* **Teleostei** - *Buglossidium luteum*, **Cnidaria** - *Alcyonium* sp., Hydrozoa, **Porifera** - Porifera, **Tunicata**
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SMx.CMx	Circalittoral mixed sediment
EUNIS: A5.44	

STATION TB_48

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	34m	
Zone	Circalittoral	
Block	38/26	
Target Location	436729 E	436729 E
Estimated sediment type from seabed imagery	Sandy gravel, pebbles and cobbles	
PSA	Poorly Sorted Wentworth: Modified Folk:	 Medium Gravel Gravel 93.3% Gravel 6.4% Sand 0.3% Mud

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - *Spirobranchus* sp. **Arthropoda (Crustacea)** - Paguridae **Mollusca** - Bivalvia **Echinodermata** - *Asterias rubens* **Other - Cnidaria** - Hydrozoa, **Porifera** - Porifera
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Notomastus latericeus* (20), Polynoidae (7), *Pholoe baltica* (7), *Lanice conchilega* (6), *Spirobranchus triqueter (6), Spirobranchus* (5), *Chone* (3) *Gattyana cirrhosa* (2), *Malmgreniella mcintoshi* (2), *Goniadella gracilis* (2), *Laonice bahusiensis* (2), *Mediomastus fragilis* (2), *Spirobranchus lamarcki* (2) **Arthropoda (Crustacea)** - *Cheirocratus* (2), *Cheirocratus sundevalli* (2) **Mollusca** - *Mya* juv. (3), *Philine* (2) **Echinodermata** - *Leptosynapta cruenta* (11)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Bryozoa** - *Escharella immersa* **Cnidaria** - *Alcyonium digitatum*

STATION TB_49

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	33m	
Zone	Circalittoral	
Block	38/27	
Target Location	459954 E	459954 E
Estimated sediment type from seabed imagery	Sandy gravel, pebbles and cobbles	
PSA	Very Poorly Sorted Wentworth: Modified Folk:	 Very Coarse Sand Sandy Gravel 49.0% Gravel 49.3% Sand 1.7% Mud

Habitat Type	
SS.SCS.CCS.PomB	*Pomatoceros triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles
A5.141	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – *Spirobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** - Paguridae, **Echinodermata** - *Asterias rubens, Ophiothrix fragilis,* Ophiurae, *Ophiura albida*, *Asterias rubens,* Asteroidea **Mollusca** - Bivalvia **Other - Cnidaria** - *Alcyonium* sp., Sertulariidae, *Hydractinia echinata*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spirobranchus triqueter* (82), *Spirobranchus* (70), *Spirobranchus lamarcki* (51), *Pholoe inornata* (21), *Eulalia* (8), *Eulalia viridis* (7), *Dodecaceria* (7), *Mediomastus fragilis* (6), *Nereimyra punctata* (6), *Owenia fusiformis* (6), *Chone* (5), *Sphaerodorum gracilis* (4), *Harmothoe impar* (3), *Spiophanes bombyx* (3), *Gattyana cirrhosa* (2), *Harmothoe* (2), Polynoidae juv. (2), *Subadyte pellucida* (2), *Eumida* (2), *Glycera lapidum* (2), *Goniada maculata* (2), *Aonides paucibranchiata* (2), *Lagis koreni* (2) **Arthropoda (Crustacea)** - *Monocorophium sextonae* (11), *Pseudoparatanais batei* (4) **Mollusca** - *Hiatella arctica* (14), Anomiidae (5), *Tritonia* (4), *Timoclea ovata* (3), Onchidoridiidae juv. (2), Bivalvia (2) **Echinodermata** - *Ophiothrix fragilis* (15), Ophiuroidea juv. (9), *Amphipholis squamata* (7), *Echinocyamus pusillus* (4) **Other - Nemertea** (5), **Sipuncula** - Golfingiidae juv. (6)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Bryozoa** -*Scrupocellaria scruposa*, *Cribrilina punctata* **Cnidaria** - *Alcyonium digitatum*

STATION TB_50

APPENDIX G - BIOTOPE CLASSIFICATION
Tranche B

Physical Environment		
Target Water Depth	34m	
Zone	Circalittoral	
Block	38/27	
Target Location	455792 E	455792 E
Estimated sediment type from seabed imagery	Sandy gravel, pebbles and cobbles	
PSA	Very Poorly Sorted Wentworth: Modified Folk: 81.6% Gravel 18.1% Sand 0.3% Mud	Medium Gravel Gravel

Habitat Type	
JNCC: SS.SMx.CMx	Circalittoral mixed sediment
EUNIS: A5.44	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - *Spirobranchus* sp. **Arthropoda (Crustacea)** - Paguridae*, Cancer pagurus* **Echinodermata** - *Psammechinus* sp., *Ophiothrix fragilis,* Ophiurae, Ophiuroidea, *Asterias rubens* **Mollusca** - Bivalvia **Other - Cnidaria** - *Alcyonium* sp., Hydrozoa, **Teleostei –** Pleuronectiformes, Soleidae, **Porifera** - Porifera
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spirobranchus* (27), *Spirobranchus lamarcki* (20), *Mediomastus fragilis* (13), *Aonides paucibranchiata* (11), *Pholoe inornata* (4), *Spiophanes bombyx* (4), *Pholoe baltica* (3), *Eteone longa* (3), *Glycera lapidum* (3), *Laonice bahusiensis* (3), *Eulalia* (2), *Eumida* (2), *Goniada maculata* (2), Polynoidae (2) **Arthropoda (Crustacea)** - *Ampelisca spinipes* (2) **Mollusca** - *Hiatella arctica* (5), Bivalvia (2) **Echinodermata** - *Echinocyamus pusillus* (3) **Other - Nemertea** (5), **Phoronida -** *Phoronis* (6), **Tunicata** - *Dendrodoa grossularia* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

STATION TB_51

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	36m	
Zone	Circalittoral	
Block	38/28	
Target Location	464243 E	464243 E
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.3% Gravel 98.2% Sand 1.5% Mud

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Other - Teleoseti** - Pleuronectiformes, *Buglossidium luteum*, **Cnidaria** - Hydrozoa
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (46), *Lanice conchilega* (31), *Owenia fusiformis* (6), *Lagis koreni* (5), *Goniada maculata* (3), *Sigalion mathildae* (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (3), *Corystes cassivelaunus* (2) **Mollusca** - *Angulus fabula* (15), *Ensis* juv. (8), *Philine* (3), Cardiidae juv. (3), *Phaxas pellucidus* (3), *Cylichna cylindracea* (2), *Abra juv.* (2) **Echinodermata** - Ophiuroidea juv. (3), Echinoidea juv. (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Cnidaria** - Campanulariidae, Filifera, *Lovenella clausa*

STATION TB_52

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	36m	
Zone	Circalittoral	
Block	38/27	
Target Location	459048 E	459048 E
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.9% Gravel 97.5% Sand 1.6% Mud

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Mollusca** - Bivaliva **Echinodermata** - *Asterias rubens, Astropecten irregularis* **Other - Teleostei** - *Buglossidium luteum*, **Cnidaria** - Hydrozoa, **Porifera** – Porifera, **Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spiophanes bombyx* (45), *Lagis koreni* (22), *Lanice conchilega* (18), *Sigalion mathildae* (2), *Goniada maculata* (2), *Owenia fusiformis* (2) **Echinodermata** - Echinoidea juv. (10), Ophiuroidea juv. (2), *Acrocnida brachiata* (2) **Mollusca** - *Angulus fabula* (10), *Ensis* juv. (7), *Phaxas pellucidus* (4), *Thyasira flexuosa* (3), *Abra prismatica* (3), *Arctica islandica* juv.(3), *Dosinia* juv.(3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

STATION TB_53

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

Physical Environment		
Target Water Depth	37m	
Zone	Circalittoral	
Block	38/27	
Target Location	459308 E	459308 E
Estimated sediment type from seabed imagery	Sand with gravel, cobbles and occasional boulders	
PSA	Very Poorly Sorted Wentworth: Modified Folk:	 Very Fine Sand Muddy Sandy Gravel 72.4% Gravel 20.4% Sand 7.2% Mud

Habitat Type	
JNCC: SS.SMx.CMx	Circalittoral mixed sediment
EUNIS: A5.44	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Mollusca** - Bivaliva **Echinodermata** - *Ophiothrix fragilis,* Ophiurae, *Ophiura albida*, *Asterias rubens* **Others** - **Teleostei** - Soleidae, Triglidae, **Cnidaria** – *Alcyonium* sp., Sertulariidae, **Bryozoa** – *Flustra foliacea,* **Bioturbation** – Faunal burrows
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Spirobranchus triqueter* (33), *Spirobranchus* (15), *Mediomastus fragilis* (11), *Spirobranchus lamarcki* (8), *Pholoe baltica* (4), *Caulleriella alata* (4), *Subadyte pellucida* (2), *Nereimyra punctata* (2) **Mollusca** - *Kurtiella bidentata* (20) **Echinodermata** - *Ophiothrix fragilis* (12), *Ophiothrix juv.* (9), *Amphipholis squamata* (4), Asteroidea juv. (2) **Other - Chordata -** Ascidiacea juv. (2), **Nemertea** (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Bryozoa** - *Crisia, Electra pilosa, Callopora dumerilii, Scrupocellaria scruposa, Chorizopora brongniartii, Escharella immerse* **Cnidaria** - *Alcyonium digitatum*

APPENDIX G - BIOTOPE CLASSIFICATION
Tranche B

STATION TB_54

Physical Environment		
Target Water Depth	37m	
Zone	Circalittoral	
Block	38/27	
Target Location	459308 E	459308 E
Estimated sediment type from seabed imagery	Sand with gravel, cobbles and occasional boulders	
Biology		
Fauna from seabed imagery	**Annelida (Polychaeta)** – *Spirobranchus* sp. **Arthropoda (Crustacea)** – Paguridae **Echinodermata** – *Ophiothrix fragilis,* Ophiurae, *Ophiura albida*, *Asterias rubens,* **Mollusca** – Bivalvia **Other** – **Porifera** – Porifera, **Cnidaria** – Hydrozoa, *Alcyonium* sp., *Hydractinia echinata,* **Bryozoa** – *Alcyonidium diaphanum,* **Bioturbation** – Faunal burrows	
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-	

Habitat Type	
JNCC: SS.SMx.CMx	Circalittoral mixed sediment
EUNIS: A5.44	

STATION TB_55

Physical Environment		
Target Water Depth	28m	
Zone	Circalittoral	
Block	44/2	
Target Location	460075 E	460075 E
Estimated sediment type from seabed imagery	Sandy gravel, cobbles and pebbles	
Biology		
Fauna from seabed imagery	**Annelida (Polychaeta)** – *Spirobranchus* sp. **Arthropoda (Crustacea)** - Paguridae **Echinodermata** - *Asterias rubens, Astropecten irregularis, Ophiura albida* **Mollusca** - Bivalvia **Other** - **Cnidaria** - *Alcyonium* sp., Sertulariidae, Hydrozoa, *Hydractinia echinata* **Teleostei** - *Buglossidium luteum*	
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-	

Habitat Type	
JNCC: SS.SMx.CMx	Circalittoral mixed sediment
EUNIS: A5.44	

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

STATION TB_TRAN_01

Physical Environment			
Target Water Depth		33-34m	
Zone		Circalittoral	
Block		UKCS 38/26	
Target Location	SOL	438230 E	6102908 N
	EOL	438082 E	6102771 N
Estimated sediment type from photos/ video		Gravelly sand	
PSA		-	

Biology	
Fauna from photos and video	**Annelida (Polychaeta)** – *Spirobranchus* sp. **Arthropoda (Crustacea)** – Brachyura, Paguridae, *Ebalia* sp., *Cancer pagurus* **Bryozoa** – *Flustra foliacea* **Echinodermata** – Asteroidea, *Asterias rubens, Echinus esculentus,* Ophiuroidea **Other - Cnidaria** – *Alcyonium sp.,* Hydrozoa **Porifera** – Porifera, **Teleostei** – Pleuronectiformes, Gadidae
Dominant fauna from biology data	-
Present fauna from biology data	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

STATION TB_TRAN_02

Physical Environment			
Target Water Depth		33m	
Zone		Circalittoral	
Block		UKCS 38/27	
Target Location	SOL	455622 E	6102516 N
	EOL	455792 E	6102351 N
Estimated sediment type from photos/ video		Sandy gravel with cobbles & boulders	
PSA		-	

Biology	
Fauna from photos and video	**Annelida (Polychaeta)** – *Spirobranchus* sp. **Arthropoda (Crustacea)** – Paguridae **Bryozoa** – *Flustra foliacea* **Echinodermata** – Asteroidea, *Asterias rubens*, *Psammechinus* sp., *Ophiothix fragilis, Ophiura albida,* Ophiuroidea, Ophiurae **Mollusca** – Bivalvia, Solenidae, Gastropoda **Other - Cnidaria –** *Alcyonium sp.* **Teleostei** – *Pleuronectes platessa*
Dominant fauna from biology data	-
Present fauna from biology data	-

Fixes	Habitat Type	
896 - 919, 921 - 923, 927 - 938, 942 - 955	**JNCC: SS.SCS.CCS**	Circalittoral coarse sediment
	EUNIS: A5.14	
920, 924 - 926, 940, 941	**JNCC: SS.SSa.CFiSa**	Circalittoral fine sand
	EUNIS: A5.25	

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

STATION TB_TRAN_03

Physical Environment			
Target Water Depth		30-33m	
Zone		Circalittoral	
Block		UKCS 38/27	
Target Location	SOL	459953 E	6104479 N
	EOL	459727 E	6104170 N
Estimated sediment type from photos/ video		Sandy gravel with cobbles becoming gravelly sand, becoming sand	
PSA		-	

Biology	
Fauna from photos and video	**Annelida (Polychaeta)** – *Spirobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** – *Ebalia* sp., *Cancer pagurus*, Paguridae **Echinodermata** – *Ophiothrix fragilis, Psammechinus* sp.*, Asterias rubens,* Ophiuroidea, Ophiurae **Mollusca** – Bivalvia **Other - Teleostei** – *Limanda limanda Callionymus lyra***, Cnidaria** – *Alcyonium* sp., Hydrozoa, **Bryozoa** – *Alcyonidium diaphanum*
Dominant fauna from biology data	-
Present fauna from biology data	-

Fix	Habitat Type	
855 – 857, 859, 860-865, 868 - 876	**JNCC: SS.SCS.CCS**	Circalittoral coarse sediment
	EUNIS: A5.14	
858, 866, 867, 877-891	**JNCC: SS.SMX.CMx**	Circalittoral mixed sediment
	EUNIS: A5.44	
892-895	**JNCC: SS.SSa.CFiSa**	Circalittoral fine sand
	EUNIS: A5.25	

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

STATION TB_TRAN_04

Physical Environment			
Target Water Depth		36m	
Zone		Circalittoral	
Block		UKCS 38/27	
Target Location	SOL	459308 E	6105741 N
	EOL	459450 E	6105588 N
Estimated sediment type from photos/ video		Sandy gravel with cobbles	
PSA		-	

Biology	
Fauna from photos and video	**Annelida (Polychaeta)** – *Spirobranchus* sp. **Arthropoda (Crustacea)** – Paguridae **Bryozoa** – *Flustra foliacea* **Echinodermata** – Asteroidea, *Asterias rubens*, *Ophiothrix fragilis,* Ophiuroidea, Ophiurae, *Echinus esculentus* **Other - Cnidaria** – *Alcyonium sp.,* Hydrozoa **Teleostei** – *Pleuronectes platessa, Myoxocephalus scorpius*
Dominant fauna from biology data	-
Present fauna from biology data	-

Fix	Habitat Type	
811-815 818 – 822, –825, 829-831, 833, 836, 838 - 844	**JNCC: SS.SMX.CMx** **(Possibly SS.SMx.CMx.OphMx)**	Circalittoral mixed sediment (Possibly *Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment)
	EUNIS: A5.44 **(Possibly A5.445)**	
816, 823, 824, 826 – 828, 832, 834, 835, 837, 845 – 850, 843, 844	**JNCC: SS.SCS.CCS**	Circalittoral coarse sediment
	EUNIS: A5.14	

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

817, 851, 852	**JNCC: SS.SSa.CFiSa**	Circalittoral fine sand
	EUNIS: A5.25	

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

STATION TB_TRAN_05

Physical Environment			
Target Water Depth		32m	
Zone		Circalittoral	
Block		UKCS 38/28	
Target Location	SOL	466494 E	6105342 N
	EOL	466630 E	6105087 N
Estimated sediment type from photos/ video		Sandy gravel with cobbles	
PSA		-	

Biology	
Fauna from photos and video	**Annelida (Polychaeta) -** *Spirobranchus* sp. **Arthropoda (Crustacea) -** Paguridae **Echinodermata** - *Asterias rubens*, *Echinus esculentus, Ophiothrix fragilis, Ophiura albida,* Ophiuroidea, Ophiurae **Mollusca** - Gastropoda **Other - Cnidaria** – *Alcyonium sp.,* Sertulariidae **Bryozoa** – *Flustra foliacea*, *Bugula* sp.
Dominant fauna from biology data	-
Present fauna from biology data	-

Fix	Habitat Type	
751, 764, 769, 776 - 778	**JNCC: SS.SCS.CCS**	Circalittoral coarse sediment
	EUNIS: A5.14	
752 - 763, 765 - 768, 770 - 775	**JNCC: SS.SMX.CMx**	Circalittoral mixed sediment
	EUNIS: A5.44	

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

STATION TB_TRAN_06

Physical Environment			
Target Water Depth		37-38m	
Zone		Circalittoral	
Block		UKCS 38/28	
Target Location	SOL	466214 E	6109729 N
	EOL	466469 E	6109704 N
Estimated sediment type from photos/ video		Silty sand with cobbles	
PSA		-	

Biology	
Fauna from photos and video	**Annelida (Polychaeta)** – *Spirobranchus* sp., **Arthropoda** – Crustacea, Paguridae **Echinodermata** – *Ophiothrix fragilis,* Ophiuroidea, Ophiurae *Asterias rubens* **Other - Cnidaria** – *Alcyonium sp.* **Teleostei** – Scorpaenidae, **Bryozoa –** *Alcyonidium diaphanum*
Dominant fauna from biology data	-
Present fauna from biology data	-

Fix	Habitat Type	
781 – 785, 789 – 792, 789 – 810	**JNCC: SS.SMX.CMx**	Circalittoral mixed sediment
	EUNIS: A5.44	
786 – 788, 794 – 798	**JNCC: SS.SCS.CCS**	Circalittoral coarse sediment
	EUNIS: A5.14	

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

STATION TB_TRAN_07

Physical Environment			
Target Water Depth		29-30m	
Zone		Circalittoral	
Block		UKCS 39/26	
Target Location	SOL	502491 E	6112762 N
	EOL	502551 E	6112573 N
Estimated sediment type from photos/ video		Sandy gravel with cobbles and boulders	
PSA		-	

Biology	
Fauna from photos and video	**Annelida (Polychaeta)** - *Spirobranchus* sp. **Arthropoda (Crustacea)** – Paguridae, Galatheidae **Echinodermata** – Asteroidea*, Asterias rubens,* Ophiuroidea*, Ophiothrix fragilis,* Ophiuroidea, Ophiurae **Mollusca** – Gastropoda **Other - Teleostei** – Gobiidae, Pleuronectiformes, **Cnidaria** – *Alcyonium sp.,* Hydrozoa*, Hydractinia echinata,* **Bryozoa** – *Bugula* sp.*, Flustra foliacea,* **Urochordata** – Ascidiacea, **Porifera** - Porifera
Dominant fauna from biology data	-
Present fauna from biology data	-

Fix	Habitat Type	
627-636, 638, 640-653, 655	**JNCC: SS.SMx.CMx**	Circalittoral mixed sediment
	EUNIS: A5.44	
637, 639, 654, 656-657	**JNCC: SS.SCS.CCS**	Circalittoral coarse sediment
	EUNIS: A5.14	

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

STATION TB_TRAN_08

Physical Environment			
Target Water Depth		30m	
Zone		Circalittoral	
Block		UKCS 44/5	
Target Location	SOL	496699 E	6093686 N
	EOL	496527 E	6093580 N
Estimated sediment type from photos/ video		Gravelly sand with cobbles	
PSA		-	

Biology	
Fauna from photos and video	**Annelida (Polychaeta) –** *Spirobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** – Paguridae **Echinodermata** – *Asterias rubens,* Asteroidea*, Psammechinus* sp.*, Ophiothrix fragilis,* Ophiuroidea, Ophiurae **Mollusca –** Bivalvia **Other - Teleostei** – Pleuronectiformes**, Cnidaria –** Actiniaria, *Alcyonium sp., Hydractinia echinata,* Hydrozoa**, Bryozoa –***Flustra foliacea***, Porifera** - Porifera
Dominant fauna from biology data	-
Present fauna from biology data	-

Fix	Habitat Type	
658, 672, 690, 691 - 694	**JNCC: SS.SCS.CCS** **EUNIS: A5.14**	Circalittoral coarse sediment
659-671, 680-689	**JNCC: SS.SMx.CMx** **EUNIS: A5.44**	Circalittoral mixed sediment
673 - 679, 695	**JNCC: SS.Ssa.CMuSa** **EUNIS: A5.26**	Circalittoral muddy sand

APPENDIX G - BIOTOPE CLASSIFICATION

Tranche B

STATION TB_TRAN_09

Physical Environment			
Target Water Depth		28-29m	
Zone		Circalittoral	
Block		UKCS 44/3	
Target Location	SOL	465352 E	6094352 N
	EOL	465200 E	6094220 N
Estimated sediment type from photos/ video		Sandy gravel with cobbles and boulders	
PSA		-	

Biology	
Fauna from photos and video	**Annelida (Polychaeta)** – *Spirobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** – Paguridae, Galatheidae **Echinodermata** – Asteroidea, *Asterias rubens,* Ophiuroidea*, Ophiura albida* **Mollusca** - Gastropoda **Other - Teleostei** – *Callionymus* sp., **Cnidaria** - Hydrozoa*, Alcyonium sp., Hydractinia echinata,* **Bryozoa** - *Bugula* sp.**, Porifera** - Porifera
Dominant fauna from biology data	-
Present fauna from biology data	-

Fix	Habitat Type	
696 - 698 747 - 750	**JNCC: SS.SMx.CMx**	Circalittoral mixed sediment
	EUNIS: A5.44	
699 – 718, 721, 733, 736 - 738	**JNCC: SS.SCS.CCS**	Circalittoral coarse sediment
	EUNIS: A5.14	
719, 720, 722- 732, 734, 735, 739 - 750	**JNCC: SS.SCS.CCS.PomB**	*Pomatoceros triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles
	EUNIS: A5.141	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_01

Physical Environment		
Target Water Depth	7m	
Zone	Infralittoral	
Block	UKCS 40/15	
Target Location	240012 E	6059525 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk: 0.2% Gravel 97.3% Sand 2.6% Mud	Fine Sand Slightly Gravelly Sand

Biology	
Fauna from seabed imagery	No visible fauna
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Magelona johnstoni* (4), *Nephtys* juv. (4), *Scolelepis bonnieri* (2), **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (28), *Bathyporeia* (2) **Mollusca** - *Abra prismatica* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.IFiSa	Infralittoral fine sand
EUNIS: A5.23	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_02

Physical Environment		
Target Water Depth	3m	
Zone	Infralittoral	
Block	UKCS 40/15	
Target Location	240273 E	6059164 N
Estimated sediment type from seabed imagery	Hard substrate - bedrock	
PSA	-	

Biology	
Fauna from seabed imagery	**Arthropoda (Crustacea)** - Brachyura*, Necora puber,* Cirripedia **Other - Cnidaria** - Hydrozoa, **Porifera** –Porifera, **Bryozoa**, **Echinodermata** - Asteroidea
Flora from seabed imagery	**Phaeophyceae** – Laminariales, **Rhodophyta** – Corallinales, Florideophyceae
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: IR.MIR.KR	Kelp and red seaweeds (moderate energy infralittoral rock)
EUNIS: A3.21	

STATION TCC_03

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	9m	
Zone	Infralittoral	
Block	UKCS 40/15	
Target Location	240553 E	6060127 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 97.6% Sand 2.3% Mud

Biology	
Fauna from seabed imagery	**Other - Teleostei** - Gobiidae
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Magelona johnstoni* (8), *Nephtys cirrosa* (3), *Magelona filformis* (2), *Nephtys* juv. (2) **Arthropoda (Crustacea)** - *Bathyporeia guilliamsoniana* (6), *Bathyporeia elegans* (5), Corophiidae (2) **Mollusca** - Mactridae juv. (2) **Echinodermata** - Echinoidea juv. (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.IFiSa (Possibly SS.SSa.IFiSa.NcirBat)	Infralittoral fine sand (Possibly *Nephtys cirrosa* and *Bathyporeia* spp. in infralittoral sand)
EUNIS: A5.23 (Possibly A5.233)	

STATION TCC_04

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	10m	
Zone	Infralittoral	
Block	UKCS 40/15	
Target Location	241175 E	6059688 N
Estimated sediment type from seabed imagery	Bedrock with boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Sp*irobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** - Cirripedia, *Necora puber* **Echinodermata** - *Echinus esculentus,* Echinoidea **Other - Bryozoa** - *Flustra foliacea*, **Cnidaria** - *Alcyonium* sp., Hydrozoa, Actiniaria
Flora from seabed imagery	**Rhodophyta** – Corallinales, Florideophyceae
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: IR.MIR.KR	Kelp and red seaweeds (moderate energy infralittoral rock)
EUNIS: A3.21	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_05

Physical Environment		
Target Water Depth	15m	
Zone	Infralittoral	
Block	UKCS 40/15	
Target Location	241195 E	6060528 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand***** 0.0% Gravel 93.2% Sand 6.8% Mud	

*** Classified as Slightly Gravelly Sand in GRADISTAT analysis due to <0.1% Very Fine Gravel**

Biology	
Fauna from seabed imagery	**Arthropoda (Crustacea)** - Caridea
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Magelona johnstoni* (37), *Magelona filiformis* (30) **Mollusca** - *Angulus fabula* (8), *Chamelea striatula* (4), *Nucula nitidosa* (4), *Tellimya ferruginosa* (4), *Abra prismatica* (2) **Echinodermata** - Ophiuroidea juv. (2) **Other - Nemertea** (3), **Phoronida** - *Phoronis* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.Ssa.ImuSa	Infralittoral muddy sand******
EUNIS: A5.24	

**** Sediments close to both fine sand and muddy sand; classification based on best fauna match**

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_06

Physical Environment		
Target Water Depth	24m	
Zone	Circalittoral	
Block	UKCS 41/11	
Target Location	242138 E	6060909 N
Estimated sediment type from seabed imagery	Fine sand	
PSA	Poorly Sorted Wentworth: Modified Folk:	 Very Fine Sand Slightly Gravelly Muddy Sand 0.1% Gravel 78.8% Sand 21.2% Mud

Biology	
Fauna from seabed imagery	**Echinodermata** - *Asterias rubens* **Other - Teleostei**
Dominant fauna from biology data	**Mollusca** - *Nucula nitidosa* (26), *Chamelea striatula* (8), *Tellimya furruginosa* (3), *Abra prismatica* (2), *Ennucula tenuis* (2), Mactridae juv. (2), *Phaxas pellucidus* (2) **Echinodermata** - Ophiuroidea juv. (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.Ssa.CMuSa	Circalittoral muddy sand*****
EUNIS: A5.26	

*** Sediments close to both sandy mud and muddy sand; classification based on best fauna match**

STATION TCC_07

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	25m	
Zone	Circalittoral	
Block	UKCS 41/11	
Target Location	242359 E	6061651 N
Estimated sediment type from seabed imagery	Bedrock with silty sand and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Caridea **Echinodermata** - Ophiuroidea*, Ophiura albida* **Other - Cnidaria** – *Alcyonium* sp., **Bryozoa** – *Flustra foliacea*
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: CR.MCR.EcCr.FaAlCr (Possibly CR.MCR.EcCr.FaAlCr.Flu)	Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock (Possibly *Flustra foliacea* on slightly scoured silty circalittoral rock)
EUNIS: A4.214 (Possibly A4.2141)	

STATION TCC_08

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	31m	
Zone	Circalittoral	
Block	UKCS 41/11	
Target Location	243703 E	6062293 N
Estimated sediment type from seabed imagery	Bedrock with silty sand and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Caridea*, Munida* sp. **Echinodermata** - Ophiuroidea **Other - Cnidaria** - *Alcyonium* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: CR.MCR.EcCr.FaAlCr	Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A4.214	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_09

Physical Environment		
Target Water Depth	34m	
Zone	Circalittoral	
Block	UKCS 41/11	
Target Location	244064 E	6062594 N
Estimated sediment type from seabed imagery	Silty sand	
PSA	Very Poorly Sorted Wentworth: Modified Folk:	 Very Coarse Silt Slightly Gravelly Sandy Mud 0.1% Gravel 37.9% Sand 62.0% Mud

Biology	
Fauna from seabed imagery	**Arthropoda (Crustacea)** – Caridea, Paguridae **Echinodermata** - Opiuroidea
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Lumbrineris cingulata* (3), *Diplocirrus glaucus* (2), *Lagis koreni* (2), **Mollusca** - *Kurtiella bidentata* (8), *Chamelea striatula* (4), *Chaetoderma nitidulum* (2), *Cylichna cylindracea* (2), *Thyasira flexuosa* (2) **Echinodermata** - *Amphiura filiformis* (39), Ophiuroidea juv. (15), *Echinocardium cordatum* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SMu.CSaMu	Circalittoral sandy mud
EUNIS: A5.35	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_10

Physical Environment		
Target Water Depth	42m	
Zone	Circalittoral	
Block	UKCS 41/6	
Target Location	245648 E	6064821 N
Estimated sediment type from seabed imagery	Silty sand	
PSA	Poorly Sorted Wentworth: Modified Folk:	 Very Coarse Silt Slightly Gravely Muddy Sand 0.4% Gravel 64.4% Sand 35.3% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaeta, polychaete tubes **Mollusca** - Scaphopoda, Gastropoda **Echinodermata** - Ophiuroidea **Arthropoda (Crustacea)** – Paguridae, Caridea
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Diplocirrus glaucus* (2), *Lagis koreni* (2), *Lumbrineris cingulata* (2) **Mollusca** - *Kurtiella bidentata* (4), *Thyasira biplicata* (4), *Cylichna cylindracea* (3), *Phaxas pellucidus* (3), *Chaetoderma nitidulum* (2), *Chamelea striatula* (2) **Echinodermata** - *Amphiura filiformis* (4), Ophiuroidea juv. (2) **Other - Cnidaria** - Edwardsiidae (6), **Phoronida** - *Phoronis* (45)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SMu.CSaMu	Circalittoral sandy mud
EUNIS: A5.35	

STATION TCC_11

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	45m	
Zone	Circalittoral	
Block	UKCS 41/6	
Target Location	249720 E	6066285 N
Estimated sediment type from seabed imagery	Gravelly sand with cobbles	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - *Munida* sp., Caridea, Paguridae **Echinodermata** – Ophiuroidea, Ophiurae **Other - Bryozoa** – *Flustra foliacea*, **Cnidaria** - *Alcyonium* sp., Hydrozoa
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_12

Physical Environment		
Target Water Depth	47m	
Zone	Circalittoral	
Block	UKCS 41/6	
Target Location	250322 E	6067629 N
Estimated sediment type from seabed imagery	Gravelly sand	
PSA	Very Poorly Sorted Wentworth: Modified Folk:	 Medium Sand Gravelly Muddy Sand 23.1% Gravel 63.8% Sand 13.1% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** - Paguridae, Caridea, Majidae **Mollusca** - Scaphopoda **Other – Cnideria** - Hydrozoa
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Peresiella clymenoides* (7), *Rhodine gracilior* (5), *Chaetozone setosa* (4), *Hydroides norvegicus* (4), *Lumbrineris cingulata* (3), *Nephtys* juv. (2), **Mollusca** - *Thysira flexuosa* (4), *Phaxas pellucidus* (2) **Echinodermata** - *Echinocyamus pusillus* (4) **Other** - **Cnidaria** Edwardsiidae (3), **Phoronida** - *Phoronis* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SMx.CMx	Circalittoral mixed sediment
EUNIS: A5.44	

STATION TCC_13

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	47m	
Zone	Circalittoral	
Block	UKCS 41/6	
Target Location	250463 E	6067990 N
Estimated sediment type from seabed imagery	Silty sandy gravel	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Sp*irobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** – Caridea, Majidae **Mollusca** - Scaphopoda **Echinodermata** – Ophiuroidea, *Ophiura albida* **Other - Bryozoa** - *Flustra foliacea*, **Cnidaria** – Sertulariidae, Hydrozoa
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

STATION TCC_14

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	50m	
Zone	Circalittoral	
Block	UKCS 41/6	
Target Location	252830 E	6069093 N
Estimated sediment type from seabed imagery	Gravelly sand with cobbles	
PSA	Very Poorly Sorted Wentworth: Medium Sand Modified Folk: Gravelly Muddy Sand 24.5% Gravel 64.9% Sand 10.6% Mud	

Habitat Type	
JNCC: SS.SMx.CMx	Circalittoral mixed sediment
EUNIS: A5.44	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Caridea, **Echinodermata** - *Ophiura albida,* Ophiuroidea, *Ophiothrix fragilis,* Ophiurae **Mollusca** - Gastropoda **Other - Bryozoa** - *Flustra foliacea*, **Cnidaria** - *Alcyonium* sp., Hydrozoa, *Hydrallmania* sp., Tubulariidae, Sertulariidae
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Lumbrineris cingulata* (17), *Levinsenia gracilis* (6), *Glycera lapidum* (4), *Trichobranchus roseus* (4), *Chaetozone setosa* (3), *Paramphinome jeffreysii* (3), *Terebellides stroemii* (3), *Exogone (Exogone) verugera* (2), *Glycera unicornis* (2), *Hydroides norvegicus* (2), *Peresiella clymenoides* (2) **Arthropoda (Crustacea)** - *Atylus vedlomensis* (2) **Mollusca** - *Thyasira flexuosa* (2) **Echinodermata** - Ophiuroidea juv. (4), Echinoidea juv. (3), *Echinocyamus pusillus* (2), Ophiuridae juv. (2), *Pseudothyone raphanus* (2) **Other - Cnidaria -** *Virgularia mirabilis* (4), Actiniaria (2), **Nemertea (10) Phoronida** - *Phoronis* (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Alcyonium parasiticum, Bugula* sp.*, Electra pilosa*

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_15

Physical Environment		
Target Water Depth	52m	
Zone	Circalittoral	
Block	UKCS 41/6	
Target Target Location	254815 E	6069875 N
Estimated sediment type from seabed imagery	Fine gravelly sand	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** - Caridea, Leucosiidae, *Munida* sp. **Mollusca** – Scaphopoda **Echinodermata** - *Asterias rubens,* Asteroidea, *Ophiura albida,* Ophiuroidea **Other - Bryozoa** - *Cellaria* sp., *Flustra foliacea*, **Cnidaria** - *Alcyonium* sp., Sertulariidae, Hydrozoa
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_16

Physical Environment		
Target Water Depth	52m	
Zone	Circalittoral	
Block	UKCS 41/7	
Target Target Location	255578 E	6069213 N
Estimated sediment type from seabed imagery	Fine gravelly sand	
PSA	Very Poorly Sorted Wentworth: Modified Folk:	 Coarse Sand Gravelly Sand 25.8% Gravel 68.2% Sand 6.0% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Sp*irobranchus* sp. **Arthropoda (Crustacea)** - *Cancer pagurus, Ebalia* sp., Caridea, **Mollusca** - Scaphopoda **Echinodermata** - *Ophiura albida*, Ophiuroidea, Ophiurae **Other - Cnidaria** - *Alcyonium* sp., Hydrozoa, *Thuiaria thuja*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Hydroides norvegicus* (20), Sp*irobranchus* sp. (7), *Lumbrineris cingulata* (6), *Ampharete lindstroemi* (5), Ampharetidae (2), *Ampharete finmarchica* (2), *Minu*spio *cirrifera* (2), *Peresiella clymenoides* (2), *Terebellides stroemii* (2) **Arthropoda (Crustacea)** - *Ampelisca* sp*inipes* (2) **Echinodermata** - *Echinocyamus pusillus* (12), Ophiuridae juv. (4), Ophiuroidea juv. (2) **Other - Cnidaria** - *Cerianthus lloydii*, (5), Edwardsiidae (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Amphiblestrum auritum, Crisia, Tubulipora*

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_17

Physical Environment		
Target Water Depth	52m	
Zone	Circalittoral	
Block	UKCS 41/7	
Target Target Location	256621 E	6069635 N
Estimated sediment type from seabed imagery	Fine sand with occasional gravel, bedrock and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Caridea, Leucosiidae, Majidae, *Munida* sp., Paguridae **Mollusca** - Scaphopoda **Echinodermata** - *Asterias rubens,* Asteroidea, Echinoidea, *Ophiothrix fragilis, Ophiura albida,* Ophiuroidea **Other - Bryozoa -** *Cellaria* sp., *Flustra foliacea*, **Teleostei** - Gobiidae, **Cnidaria** – Hydrozoa, Sertulariidae, *Abietinaria* sp., *Hydrallmania* sp., *Thuiaria thuja*
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS / CR.MCR.EcCr.FaAlCr	Circalittoral coarse sediment with patches of faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A5.14 / A4.214	

STATION TCC_18

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	56m	
Zone	Circalittoral	
Block	UKCS 41/7	
Target Target Location	258827 E	6071741 N
Estimated sediment type from seabed imagery	Fine gravelly sand	
PSA	Very Poorly Sorted Wentworth: Modified Folk:	 Medium Sand Gravelly Sand 14.7% Gravel 83.3% Sand 2.0% Mud

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, *Spirobranchus* sp. **Arthropoda (Crustacea)** - Paguridae **Mollusca** - Scaphopoda **Echinodermata** - *Asterias rubens,* Asteroidea, *Ophiothrix fragilis,* Ophiuroidea **Other - Bryozoa -** *Alcyonidium diaphanum, Flustra foliacea*, **Teleostei** - Gobiidae, **Cnidaria** - *Alcyonium* sp., Sertulariidae, **Porifera**
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Paramphinome jeffreysii* (15), *Scoloplos (Scoloplos) armiger* (6), *Hydroides norvegicus* (4), Sp*iophanes bombyx* (3), *Chaetozone christiei* (2), *Eumida* (2), *Galathowenia oculata* (2), *Poecilochaetus serpens* (2), Sp*iophanes kroyeri* (2) **Arthropoda (Crustacea)** - *Harpinia antennaria* (4) **Mollusca** - *Ennucula tenuis* (8), *Philine* sp. (2) **Echinodermata** - Ophiuroidea juv. (7), Echinoidea juv. (2) **Other - Nemertea** (3), **Phoronida -** *Phoronis* sp. (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Alcyonidium diaphanum, Eucratea loricata*

STATION TCC_19

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	56m	
Zone	Circalittoral	
Block	UKCS 41/7	
Target Target Location	258887 E	6070718 N
Estimated sediment type from seabed imagery	Gravelly sand with occasional boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Majidae, Paguridae **Mollusca** - Scaphopoda **Echinodermata** - Asteroidea, Ophiuroidea **Other - Bryozoa** - *Flustra foliacea*, **Teleostei** - Gobiidae, Pleuronectiformes, **Cnidaria** – Hydrozoa, Sertulariidae, *Abietinaria* sp., *Hydrallmania* sp.,
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_20

Physical Environment		
Target Water Depth	57m	
Zone	Circalittoral	
Block	UKCS 41/7	
Target Target Location	265547 E	6074991 N
Estimated sediment type from seabed imagery	Fine sand with patches of shell fragments	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, *Spirobranchus* sp. **Arthropoda (Crustacea)** - Majidae, Paguridae **Mollusca** - Bivalvia, Scaphopoda **Echinodermata** - Ophiuroidea **Other - Bryozoa** - *Cellaria* sp., **Cnidaria** - Hydrozoa, **Porifera** – Porifera,
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_21

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	56m	
Zone	Circalittoral	
Block	UKCS 41/7	
Target Target Location	266109 E	6071408 N
Estimated sediment type from seabed imagery	Fine sand with patches of coarse sediment and areas of bedrock and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - *Spirobranchus* sp. **Arthropoda (Crustacea)** -Caridea*, Munida* sp. **Echinodermata** - *Asterias rubens,* Asteroidea, *Ophiothrix fragilis,* Ophiurae **Mollusca** - Scaphopoda **Other - Bryozoa** - *Flustra foliacea*, **Teleostei** - *Lophius piscatorius,* **Cnidaria** - *Alcyonium* sp.*,* Sertulariidae, *Hydrallmania* sp., *Abietinaria* sp., **Porifera** - Porifera, **Foraminifera -** *Astrorhiza* sp**.**
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS / CR.MCR.EcCr.FaAlCr	Circalittoral coarse sediment with patches of faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A5.14 / A4.214	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_22

Physical Environment		
Target Water Depth	60m	
Zone	Circalittoral	
Block	UKCS 41/8	
Target Target Location	271585 E	6077859 N
Estimated sediment type from seabed imagery	Fine sand with patches of coarse sediment	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.2% Gravel 97.9% Sand 1.9% Mud	

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes, *Spirobranchus* sp. **Arthropoda (Crustacea)** - Brachyura, Caridea **Mollusca** - Scaphopoda **Echinodermata** - Asteroidea, *Echinus esculentus* **Other - Cnidaria** - *Alcyonium* sp., Hydrozoa, *Virgularia mirabilis*, **Bryozoa** – *Flustra foliacea,* **Formainifera** – *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Scoloplos (Scoloplos) armiger* (7), *Chaetozone setosa* (2), *Paramphinome jeffreysii* (2) **Arthropoda (Crustacea)** - *Urothoe elegans* (2) **Mollusca** - *Ennucula tenuis* (5), *Kurtiella bidentata* (3), *Arctica islandica* juv. (2), *Cylichna cylindracea* (2) **Echinodermata** - Ophiuroidea juv. (9), *Amphiura filiformis* (5), *Echinocardium flavescens* (2), Echinoidea juv. (2) **Other - Cnidaria** - *Virgularia mirabilis* (3), **Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

STATION TCC_23

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	59m	
Zone	Circalittoral	
Block	UKCS 41/8	
Target Target Location	272327 E	6077077 N
Estimated sediment type from seabed imagery	Fine to coarse sand with occasional boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Sp*irobranchus* sp*.* **Arthropoda (Crustacea)** - Caridea, Paguridae, Brachyura **Mollusca** - Scaphopoda **Echinodermata** - *Echinus esculentus,* Ophiuroidea, Spatangoida **Other - Cnidaria** - *Alcyonium* sp*.,* Hydrozoa, *Virgularia mirabilis, Tubularia* sp., **Foraminifera -** *Astrorhiza* sp**.**, **Porifera** - Porifera
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS / CR.MCR.EcCr.FaAlCr	Circalittoral coarse sediment with patches of faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock)
EUNIS: A5.14 / A4.214	

STATION TCC_24

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	61m	
Zone	Circalittoral	
Block	UKCS 41/8	
Target Target Location	278285 E	6078722 N
Estimated sediment type from seabed imagery	Fine sand (with occasional boulder)	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.2% Gravel 97.4% Sand 2.5% Mud	

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, *Spirobranchus* sp. **Arthropoda (Crustacea)** - Caridea, Paguridae **Mollusca** - Scaphopoda **Echinodermata** - Asteroidea, *Astropecten irregularis* **Other - Cnidaria** - *Alcyonium* sp., Hydrozoa, Sertulariidae, *Hydrallmania* sp., *Abietinaria* sp. *Virgularia mirabilis*, **Foraminifera** - *Astrorhiza* sp., **Porifera** - Porifera
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (23), *Amphictene auricoma* (10), *Scoloplos (Scoloplos) armiger* (7), *Ampharete lindstroemi* (2), *Diplocirrus glaucus* (2), **Arthropoda (Crustacea)** - *Harpinia antennaria* (6), *Ampelisca diadema* (2), **Mollusca** - *Nucula nitidosa* (18*), Abra prismatica* (11*), Cylichna cylindracea* (8), *Thyasira flexuosa* (4), *Chamelea striatula* (3), *Phaxas pellucidus* (3), *Antalis entails* (2) **Echinodermata** - Ophiuroidea juv. (17), *Amphiura filiformis* (6), Asteroidea juv. (2), Echinoidea juv. (2) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (8), **Phoronida** - *Phoronis* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

STATION TCC_25

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	63m	
Zone	Circalittoral	
Block	UKCS 41/9	
Target Location	285987 E	6078481 N
Estimated sediment type from seabed imagery	Fine to medium sand with shell fragments	
PSA	Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.1% Gravel 97.8% Sand 2.0% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaeta, Polychaete tubes **Arthropoda (Crustacea)** - Caridae, *Ebalia* sp. **Echinodermata** – Asteroidea **Other - Cnidaria** - *Pennatula phosphorea*, **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Goniada maculata* (3) **Arthropoda (Crustacea)** - *Harpinia antennaria* (2) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (4), **Phoronida** - *Phoronis* (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_26

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	63m	
Zone	Circalittoral	
Block	UKCS 41/9	
Target Location	286248 E	6077558 N
Estimated sediment type from seabed imagery	Fine to medium sand with shell fragments	
PSA	Moderately Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 97.2% Sand 2.7% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaeta, Polychaete tubes **Arthropoda (Crustacea)** - *Ebalia* sp., Caridae, Paguridae **Echinodermata** - Ophiuroidea, *Asterias rubens* **Other - Teleostei** - *Lophius piscatorius*, **Cnidaria** - *Pennatula phosphorea*, *Virgularia mirabilis*, *Alcyonium* sp., **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Paramphinome jeffreysi* (3), *Cirratulus caudatus* (2), *Owenia fusiformis* (2) **Mollusca** - *Ennucula tenuis* (3) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (4), **Phoronida** - *Phoronis* (6)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_27

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	65m	
Zone	Circalittoral	
Block	UKCS 41/9	
Target Location	290641 E	6078722 N
Estimated sediment type from seabed imagery	Fine to medium sand with shell fragments	
PSA	Very Well Sorted Wentworth: Modified Folk: 0.1% Gravel 96.6% Sand 3.4% Mud	Fine Sand Slightly Gravelly Sand

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Brachyura, Caridae, Paguridae **Other - Cnidaria** - *Alcyonium* sp., *Pennatula phosphorea*, **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Siophanes kroyeri* (3), *Chaetozone setosa* (2), *Siophanes bombyx* (2) **Echinodermata** - Ophiuroidae juv. (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_28

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	72m	
Zone	Circalittoral	
Block	UKCS 41/9	
Target Location	293690 E	6080667 N
Estimated sediment type from seabed imagery	Fine to medium sand with shell fragments	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - *Ebalia* sp. **Echinodermata** - Asteroidea, Ophiuroidea **Other - Bryozoa** - *Flustra foliacea*, Vesiculariidae, **Cnidaria** - *Alcyonium* sp., Hydrozoa, *Pennatula phosphorea*, **Foraminifera -** *Astrorhiza* sp**.**
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_29

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	71m	
Zone	Circalittoral	
Block	UKCS 41/5	
Target Location	295435 E	6081109 N
Estimated sediment type from seabed imagery	Fine to medium sand with shell fragments	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.3% Gravel 95.2% Sand 4.5% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, *Spirobranchus* sp. **Arthropoda (Crustacea)** - Paguridae **Echinodermata** – Ophiuroidea, *Astropecten irregularis* **Other - Cnidaria** - *Alcyonium* sp., Hydrozoa, *Pennatula phosphorea*, **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** – *Galathowenia oculata* (12), *Paramphinome jeffreysii* (5), *Scoloplos (Scoloplos) armiger* (5), *Owenia fusiformes* (3), *Chaetozone setosa* (2), *Diplocirrus glaucus* (2), *Goniada maculata* (2), *Lumbrineris cingulata* (2) **Mollusca** - *Cylichna cylindracea* (3), *Thyasira flexuosa* (2) **Echinodermata** - Echinoidea juv. (14), *Labidoplax buskii* (2) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (6)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_30

Physical Environment		
Target Water Depth	72m	
Zone	Circalittoral	
Block	UKCS 41/5	
Target Location	297361 E	6080707 N
Estimated sediment type from seabed imagery	Fine to medium sand with shell fragments	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Caridae **Echinodermata** - Ophiuroidea **Other - Bryozoa** - *Flustra foliacea*, **Cnidaria** - *Alcyonium* sp., *Pennatula phosphorea*, **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_31

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	81m	
Zone	Circalittoral	
Block	UKCS 41/5	
Target Location	300671 E	6082352 N
Estimated sediment type from seabed imagery	Fine to medium sand with shell fragments	
PSA	Very Well Sorted Wentworth: Modified Folk: 0.2% Gravel 96.1% Sand 3.7% Mud	 Fine Sand Slightly Gravelly Sand

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Terebellidae **Arthropoda (Crustacea)** - Caridae **Echinodermata** - Asteroidea **Other - Bryozoa**, **Cnidaria** - *Alcyonium* sp., Hydrozoa, Sertulariidae, *Pennatula phosphorea*, **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Galathowenia oculata* (3), *Paramphinome jeffreysii* (3), *Trichobranchus roseus* (3) **Arthropoda (Crustacea)** - *Ennucula tenuis* (4), *Hiatella arctica* (2), *Philine* (2) **Echinodermata** - Echinoidea juv. (8), *Amphiura filiformis* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_32

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	75m	
Zone	Circalittoral	
Block	UKCS 41/5	
Target Location	305325 E	6085221 N
Estimated sediment type from seabed imagery	Fine to medium sand with shell fragments	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.5% Gravel 96.9% Sand 2.7% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - *Ophiodromus flexuosus*, Polychaete tubes **Arthropoda (Crustacea)** - Caridae, Paguridae **Echinodermata** - Asteroidea, Ophiuroidea **Other - Bryozoa**, **Teleostei** - Gobiidae, **Cnidaria** - *Alcyonium* sp., Hydrozoa, *Pennatula phosphorea*, **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Galathowenia oculata* (22), *Paramphinome jeffreysii* (2), *Myriochele danielsseni* (3), *Owenia fusiformes* (3) **Arthropoda (Crustacea)** - *Harpinia antennaria* (3) **Echinodermata** - Echinoidea juv. (9), Ophiuroidea juv. (4), *Labidoplax buskii* (2) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (4), **Phoronida** - *Phoronis* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_33

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	63m	
Zone	Circalittoral	
Block	UKCS 41/5	
Target Location	307210 E	6086324 N
Estimated sediment type from seabed imagery	Fine to coarse sand with patches of gravel, cobbles and shell fragments	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Caridae, *Ebalia* sp., Galatheidae **Echinodermata** - Asteroidea **Other - Bryozoa**, **Cnidaria** - *Alcyonium* sp., Hydrozoa, Sertulariidae, *Pennatula phosphorea, Thuiaria thuja*
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_34

Physical Environment		
Target Water Depth	72m	
Zone	Circalittoral	
Block	UKCS 42/1	
Target Location	309497 E	6087648 N
Estimated sediment type from seabed imagery	Fine to medium sand with shell fragments	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Caridae **Mollusca** - Pectinidae **Echinodermata** - Asteroidea, Ophiuroidea **Other – Bryozoa**, **Cnidaria** - *Alcyonium* sp., Hydrozoa, *Pennatula phosphorea*, **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_35

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	75m	
Zone	Circalittoral	
Block	UKCS 42/1	
Target Target Location	310901 E	6088551 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.9% Gravel 95.1% Sand 3.9% Mud	

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - Brachyura **Mollusca** - Scaphopoda, Bivalvia **Echinodermata** - Ophiuroidea, Asteroidea **Other - Cnidaria** - *Pennatula phosphorea*, *Alcyonium* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Paramphinome jeffreysii* (14), *Ampharete falcata* (10), *Owenia fusiformis* (7), *Scoloplos (Scoloplos) armiger* (7), *Chaetozone setosa* (5), *Aonides paucibranchiata* (3), *Cauleriella killariensis* (2), *Diplocirrus glaucus* (2), *Magelona alleni* (2), *Minuspio cirrifera* (2), *Myriochele danielsseni* (2), *Praxillella affinis* (2) **Arthropoda (Crustacea)** - *Harpinia antennaria* (3), *Photis longicaudata* (2) **Mollusca** - *Philine* (3), *Lucinoma borealis* (2) **Echinodermata** - Echinoidea juv. (30), Ophiuroidea juv. (4), Ophiuridae juv. (2), *Pseudothyone raphanus* (2) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (2), **Nemertea** (2), **Phoronida** - *Phoronis* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

STATION TCC_36

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	68m	
Zone	Circalittoral	
Block	UKCS 42/1	
Target Target Location	312927 E	6089895 N
Estimated sediment type from seabed imagery	Fine sand with gravel	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Caridea **Mollusca** - Scaphopoda **Echinodermata** - Asteroidea, *Echinus esculentus* **Other - Teleostei**, **Cnidaria** - Hydrozoa
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

STATION TCC_37

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	68m	
Zone	Circalittoral	
Block	UKCS 42/1	
Target Target Location	314110 E	6090577 N
Estimated sediment type from seabed imagery	Fine to medium sand with patches of coarse sediment	
PSA	Poorly Sorted Wentworth: Modified Folk:	 Medium Sand Gravelly Sand 14.6% Gravel 83.0% Sand 2.4% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - *Asterias rubens*, Asteroidea, *Ceramaster granularis*, Ophiuroidea **Other - Cnidaria** - Hydrozoa, *Pennatula phosphorea*, **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Paramphinome jeffreysii* (22), *Galathowenia oculata* (15), *Ampharete falcata* (7), *Myriochele danielsseni* (6), *Owenia fusiformis* (5), *Goniada maculata* (3), *Levinsenia gracilis* (3), Spiophanes *kroyeri* (2) **Arthropoda (Crustacea)** - *Harpinia antennaria* (3) **Echinodermata** - Echinoidea juv. (16), *Pseudothyone raphanus* (8), Ophiuroidea juv. (5), *Labidoplax buskii* (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Bugula purpurotincta*, **Cnidaria** - Plumulariidae

Habitat Type	
JNCC: SS.SSa.CFiSa/SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25/A5.14	

STATION TCC_38

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	71m	
Zone	Circalittoral	
Block	UKCS 42/1	
Target Target Location	316638 E	6092582 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Echinodermata** - Asteroidea, Ophiuroidea **Other - Cnidaria** - Hydrozoa, *Pennatula phosphorea*, **Foraminifera** - *Astrorhiza* sp., **Porifera** - Porifera
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_39

Physical Environment		
Target Water Depth	73m	
Zone	Circalittoral	
Block	UKCS 42/1	
Target Target Location	317882 E	6092923 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.9% Gravel 95.6% Sand 3.4% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - Asteroidea, Ophiuroidea **Other - Cnidaria** - Hydrozoa, *Pennatula phosphorea*, **Foraminifera** - *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Ampharete falcata* (13), *Paramphinome jeffreysii* (7), *Chaetozone setosa* (6), *Galathowenia oculata* (4), Pectinariidae (juv) (4), *Owenia fusiformis* (3), Ampharetidae (2), *Scoloplos (Scoloplos) armiger* (2), Sp*iophanes kroyeri* (2), T*richobranchus roseus* (2) **Arthropoda (Crustacea)** - *Harpinia antennaria* (5), *Caprella linearis* (4), *Phtisica marina* (3) **Mollusca** - *Philine* (4), *Vitreolina philippi* (2) **Echinodermata** - Echinoidea juv. (31), Ophiuroidea juv. (10), *Pseudothyone raphanus* (3), *Amphiura filiformis* (2) **Other - Cnidaria** - *Cerianthus lloydii* (2), **Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Bugula avicularia*, **Cnidaria** - Plumulariidae

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_40

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	74m	
Zone	Circalittoral / Offshore Circalittoral	
Block	UKCS 42/2	
Target Target Location	324742 E	6094127 N
Estimated sediment type from seabed imagery	Fine sand	
PSA	Moderately Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 93.9% Sand 6.0% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** – Majidae **Mollusca** – Scaphopoda **Echinodermata** – Asteroidea **Other - Cnidaria** – *Alcyonium* sp., Hydrozoa, *Pennatula phosphorea*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Praxillella affinis* (16), *Owenia fusiformis* (13), *Paramphinome jeffreysii* (12), *Galathowenia oculata* (9), *Ampharete falcata* (5), *Scoloplos (Scoloplos) armiger* (2) **Arthropoda (Crustacea)** - *Harpinia antennaria* (5) **Mollusca** - *Philine* sp. (2) **Echinodermata** - Echinoidea juv. (22), Ophiuroidea juv. (5), *Amphiura filiformis* (3), *Labidoplax buskii* (3), Asteroidea juv. (2) **Other - Cnidaria** - *Cerianthus lloydii* (4), **Nemertea** (5), **Phoronida** - *Phoronis* sp. (6)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CmuSa **(Possibly SS.Ssa.Osa.OfusAfil)**	Circalittoral muddy sand (Possibly *Owenia fusiformis* and *Amphiura filiformis* in offshore circalittoral sand or muddy sand)
EUNIS: A5.26 **(Possibly A5.272)**	

STATION TCC_41

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	75m	
Zone	Circalittoral	
Block	UKCS 42/2	
Target Target Location	325404 E	6094267 N
Estimated sediment type from seabed imagery	Fine sand	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Brachyura **Mollusca** - Scaphopoda **Echinodermata** – Ophiuroidea **Other - Cnidaria** - Hydrozoa, *Pennatula phosphorea*
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CMuSa	Circalittoral muddy sand
EUNIS: A5.26	

STATION TCC_42

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	78m	
Zone	Circalittoral	
Block	UKCS 42/3	
Target Target Location	334771 E	6095150 N
Estimated sediment type from seabed imagery	Fine sand	
PSA	Moderately Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.9% Gravel 93.0% Sand 6.2% Mud

Habitat Type	
JNCC: SS.SSa.CMuSa	Circalittoral muddy sand
EUNIS: A5.26	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Caridea, Paguridae **Echinodermata** - *Asterias rubens*, *Astropecten irregularis,* Ophiuroidea **Other - Teleostei** - Gobiidae, **Cnidaria** - *Pennatula phosphorea*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Paramphinome jeffreysii* (53), *Praxillella affinis* (13), *Galathowenia oculata* (12), Spiophanes *bombyx* (8), *Owenia fusiformis* (6), *Ampharete lindstroemi* (4), *Goniada maculata* (3), *Myriochele danielsseni* (3), Spiophanes *kroyeri* (3), *Ampharete falcata* (2), *Heteromastus filiformis* (2), *Scoloplos (Scoloplos) armiger* (2) **Arthropoda (Crustacea)** - *Ampelisca macrocephala* (2), *Tmetonyx cicada* (2) **Mollusca** - *Thyasira flexuosa* (4), *Chaetoderma nitidulum* (3) **Echinodermata** - *Amphiura filiformis* (6), Ophiuroidea juv. (3), *Labidoplax buskii* (2) **Other - Nemertea** (3), **Phoronida** - *Phoronis* sp. (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Nematoda**

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_43

Physical Environment		
Target Water Depth	83m	
Zone	Circalittoral	
Block	UKCS 42/3	
Target Target Location	335875 E	6095391 N
Estimated sediment type from seabed imagery	Fine sand	
PSA	Moderately Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 93.1% Sand 6.8% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Echinodermata** - Ophiuroidea **Other - Teleostei** - *Myxine glutinosa*, **Cnidaria** - *Pennatula phosphorea*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Paramphinome jeffreysii* (16), *Praxillella affinis* (11), *Ampharete falcata* (8), *Owenia fusiformis* (7), Sp*iophanes bombyx* (5), *Heteromastus filiformis* (3), *Galathowenia oculata* (3), Ampharetidae (2), Sp*iophanes kroyeri* (2), **Arthropoda (Crustacea)** - *Ampelisca tenuicornis* (3) **Mollusca** - *Thyasira equalis* (7), *Thyasira biplicata* (5) **Echinodermata** - Ophiuroidea juv. (7), *Amphiura filiformis* (2) **Other - Nemertea** (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Nematoda**

Habitat Type	
JNCC: SS.SSa.CMuSa	Circalittoral muddy sand
EUNIS: A5.26	

STATION TCC_44

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	72m	
Zone	Circalittoral	
Block	UKCS 42/3	
Target Target Location	340007 E	6097096 N
Estimated sediment type from seabed imagery	Fine to medium sand with gravel, pebbles, and cobbles	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Paguridae, *Ebalia* sp. **Mollusca** – Nudibranchia **Echinodermata** - *Astropecten irregularis*, Ophiuroidea **Other - Cnidaria** - Hydrozoa, *Pennatula phosphorea, Epizoanthis papillosus,* Sertulariidae, *Alcyonium* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa/SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25/A5.14	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_45

Physical Environment		
Target Water Depth	73m	
Zone	Circalittoral	
Block	UKCS 36/28	
Target Target Location	343698 E	6097858 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Poorly Sorted Wentworth: Modified Folk:	 Fine Sand Gravelly Sand 13.2% Gravel 83.9% Sand 2.9% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaeta **Arthropoda** - Paguridae **Other - Cnidaria** – Sertulariidae, *Pennatula phosphorea, Alcyonium* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (9), *Galathowenia oculata* (3), *Owenia fusiformis* (3), *Paramphinome jeffreysii* (3), *Ampharete falcata* (2), *Chaetozone setosa* (2), *Goniada maculata* (2) Sp*iophanes kroyeri* (2), *Sthenelais limicola* (2) **Mollusca** - *Phaxas pellucidus* (2) **Echinodermata** - Ophiuroidea juv. (3), *Pseudothyone raphanus* (3), *Amphiura filiformis* (2), *Labidoplax buskii* (2) **Other - Nemetea** (2), **Phoronida** - *Phoronis* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa/SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25/A5.14	

STATION TCC_46

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	75m	
Zone	Circalittoral	
Block	UKCS 36/28	
Target Target Location	345283 E	6098219 N
Estimated sediment type from seabed imagery	Fine muddy sand	
PSA	Poorly Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Muddy Sand 4.0% Gravel 86.3% Sand 9.7% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - *Astropecten irregularis* **Other - Cnidaria** - Sertulariidae, *Pennatula phosphorea*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Paramphinome jeffreysii* (35), *Ampharete lindstroemi* (13), *Notomastus latericeus* (8), *Galathowenia oculata* (6), *Heteromastus filiformis* (4), *Phyllodoce groenlandica* (4), *Glycera unicornis* (3), *Owenia fusiformis* (3), *Glycera* juv. (2), Maldanidae (2), *Spiophanes kroyeri* (2) **Mollusca** - *Thyasira equalis* (3) **Echinodermata** - Ophiuroidea juv. (2), *Amphiura* sp. (2), *Pseudothyone raphanus* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Nematoda**

Habitat Type	
JNCC: SS.SSa.CMuSa	Circalittoral muddy sand
EUNIS: A5.26	

STATION TCC_47

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	74m	
Zone	Circalittoral / Offshore Circalittoral	
Block	UKCS 36/29	
Target Location	348071 E	6097698 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Moderately Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.2% Gravel 93.8% Sand 6.0% Mud

Habitat Type	
JNCC: SS.SSa.CmuSa **(Possibly SS.Ssa.Osa.OfusAfil)**	Circalittoral muddy sand (Possibly *Owenia fusiformis* and *Amphiura filiformis* in offshore circalittoral sand or muddy sand)
EUNIS: A5.26 **(Possibly A5.272)**	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - Ophiuroidea **Other - Cnidaria** - *Alcyonium* sp., *Pennatula phosphorea*, *Virgularia mirabilis*, **Foraminifera** - *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Paramphinome jeffreysii* (21), *Galathowenia oculata* (17), *Ampharete falcata* (12), *Trichobranchus roseus* (5), *Ampharete lindstroemi* (4), *Goniada maculata* (4), *Myrriochele danielsseni* (3), *Owenia fusiformes* (3), *Phyllodoce groenlandica* (3), Spiophanes *bombyx* (3), Spiophanes *kroyeri* (3), *Chaetozone setosa* (2), *Cirratulus caudatus* (2), *Sthenelais limicola* (2) **Arthropoda (Curstacea)** - *Ampelisca tenuicornis* (3), *Hippomedon denticulatus* (3) **Mollusca** - *Antalis entalis* (4), *Phaxas pellucidus* (4), *Arctica islandica* juv. (2), *Abra nitida* (2), *Thyasira flexuosa* (2) **Echinodermata** - Ophiuroidea juv. (6), *Pseudothyone raphanus* (5), *Amphiura filiformis* (3), *Labidoplax buskii* (3), Ophiuridae juv. (3) **Other - Foraminifera -** *Astrorhiza* sp**. -** *Astrorhiza* (8), **Nemertea** (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

STATION TCC_48

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	74m	
Zone	Circalittoral / Offshore Circalittoral	
Block	UKCS 36/29	
Target Location	353888 E	6098841 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Moderately Sorted Wentworth: Modified Folk: 0.7% Gravel 93.5% Sand 5.9% Mud	Fine Sand Slightly Gravelly Sand

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Other - Cnidaria** - *Pennatula phosphorea, Alcyonium* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Galathowenia oculata* (18), *Diplocirrus glaucus* (6), *Owenia fusiformes* (5), *Paramphinome jeffreysii* (5), *Praxillella affinis* (3), *Glycera unicornis* (2) **Mollusca** - *Thyasira biplicata* (3), *Phaxas pellucidus* (2), *Thyasira* (2) **Echinodermata** - Ophiuroidea juv. (6), *Amphiura filiformis* (2) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (3), Nemertea (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CmuSa **(Possibly SS.Ssa.Osa.OfusAfil)**	Circalittoral muddy sand (Possibly *Owenia fusiformis* and *Amphiura filiformis* in offshore circalittoral sand or muddy sand)
EUNIS: A5.26 **(Possibly A5.272)**	

STATION TCC_49

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	73m	
Zone	Circalittoral	
Block	UKCS 36/30	
Target Location	358822 E	6099322 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.2% Gravel 94.6% Sand 5.2% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Other - Teleostei** - Pleuronectiformes, **Cnidaria** - *Pennatula phosphorea, Alcyonium* sp., **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Paramphinome jeffreysii* (5), *Galathowenia oculata* (3), *Ampharete falcata* (12), *Diplocirrus glaucus* (3), Sp*iophanes bombyx* (2), Sp*iophanes kroyeri* (2) **Mollusca** - *Philine* (3), *Cylichna cylindracea* (2), *Chamelea striatula* (2) **Echinodermata** - Ophiuroidea juv. (5), Asteroidea juv. (2), *Pseudothyone raphanus* (2), **Other - Nemertea** (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CMuSa	Circalittoral muddy sand
EUNIS: A5.26	

STATION TCC_50

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	71m	
Zone	Circalittoral	
Block	UKCS 36/30	
Target Location	359464 E	6099383 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Other - Cnidaria** - *Pennatula phosphorea, Alcyonium* sp., **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CMuSa	Circalittoral muddy sand
EUNIS: A5.26	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_51

Physical Environment		
Target Water Depth	62m	
Zone	Circalittoral	
Block	UKCS 36/30	
Target Location	364740 E	6100767 N
Estimated sediment type from seabed imagery	Fine to medium sand with patches of coarse sediment	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Platyhelminthes **Echinodermata** - *Asterias rubens*, Asteroidea **Other - Cnidaria** - *Pennatula phosphorea*, Hydrozoa, **Porifera** - Porifera
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_52

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	63m	
Zone	Circalittoral	
Block	UKCS 36/30	
Target Location	366405 E	6100887 N
Estimated sediment type from seabed imagery	Fine to medium sand with patches of coarse sediment	
PSA	Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.9% Gravel 96.2% Sand 2.9% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Caridae, Paguridae, *Cancer pagurus* **Echinodermata** - *Henricia* sp. **Other - Teleostei** - Pleuronectiformes. Rajidae **Cnidaria** - *Pennatula phosphorea, Epizoanthus papillosus,* Hydrozoa
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (9), *Paramphinome jeffreysii* (5), *Scoloplos (Scoloplos) armiger* (4), *Diplocirrus glaucus* (3), *Chaetozone setosa* (2), *Nephtys assimilis* (2), *Nephtys kersivalensis* (2) **Arthropoda (Crustacea)** - *Harpinia antennaria* (2) **Mollusca** - *Lucinoma borealis* (4) **Echinodermata** - Ophiuroidea juv. (3) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (2), **Phoronida** - *Phoronis* sp. (6)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_53

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	61m	
Zone	Circalittoral	
Block	UKCS 36/30	
Target Location	371373 E	6100444 N
Estimated sediment type from seabed imagery	Fine to medium sand with patches of coarse sediment and cobbles	
PSA	Very Poorly Sorted Wentworth: Coarse Sand Modified Folk: Sandy Gravel 43.1% Gravel 54.2% Sand 2.7% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Echinodermata** - *Ophiothrix fragilis, Asterias rubens,* Ophiurae **Other - Teleostei** - Rajidae, Gadiformes, **Cnidaria** - *Alcyonium* sp., *Virgularia mirabilis,* Hydrozoa
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (21), *Amphictene auricoma* (9), *Paramphinome jeffreysii* (9), *Scoloplos (Scoloplos) armiger* (7), *Goniada maculata* (4), *Chaetozone christiei* (3), *Lagis koreni* (3), *Pholoe baltica (sensu Petersen)* (2), *Nephtys hombergii* (2) **Mollusca** - *Thyasira flexuosa* (5), *Philine* (3), *Abra* juv. (2) **Echinodermata** - Ophiuroidea juv. (9), Asteroidea juv. (4), *Amphiura filiformis* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa/SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25/A5.14	

STATION TCC_54

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	62m	
Zone	Circalittoral	
Block	UKCS 37/26	
Target Location	378320 E	6102070 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand***** 0.0% Gravel 94.9% Sand 5.1% Mud

*** Classified as Slightly Gravelly Sand in GRADISTAT analysis due to <0.1% Very Fine Gravel**

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Aphroditidae **Arthropoda (Crustacea)** - Paguridae **Other - Cnidaria** - *Alcyonium* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (25), *Amphictene auricoma* (7), *Diplocirrus glaucus* (6), *Goniada maculata* (4), *Magelona filiformis* (3), Sp*iophanes kroyeri* (3), *Nephtys* juv. (2), *Scoloplos (Scoloplos) armiger* (2) **Arthropoda (Crustacea)** - *Harpinia antennaria* (5) **Mollusca** - *Thyasira flexuosa* (9), *Nucula nitidosa* (8), *Abra prismatica* (5), *Lucinoma borealis* (4), *Acteon tornatilis* (3), *Cylichna cylindracea* (3) **Echinodermata** - Ophiuroidea juv. (10), Asteroidea juv. (3), Echinoidea juv. (2) **Other - Phoronida** - Phoronis (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_55

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	57m	
Zone	Circalittoral	
Block	UKCS 37/27	
Target Location	386344 E	6102953 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 97.0% Sand 2.9% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, **Arthropoda (Crustacea)** - Caridae, Paguridae, Amphipoda **Echinodermata** - Asteroidea, Ophiuroidea **Other - Teleostei** - *Limanda limanda*, Gadiformes, **Cnidaria** - *Epizoanthus papillosus, Hydractinia echinata*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Lagis koreni* (4), *Sthenelais limicola* (3), *Chaetozone setosa* (2), *Magelona filiformis* (2), *Poecilochaetus serpens* (2) **Mollusca** - *Thyasira flexuosa* (7), *Nucula nitidosa* (2), *Abra prismatica* (5), *Lucinoma borealis* (3), *Philine* (3) **Echinodermata** - Ophiuroidea juv. (3), Echinoidea juv. (6)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Cnidaria** - *Lovenella clausa*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_56

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	43m	
Zone	Circalittoral	
Block	UKCS 37/27	
Target Location	390777 E	6103414 N
Estimated sediment type from seabed imagery	Fine to medium sand with patches of shell fragments	
PSA	Poorly Sorted Wentworth: Medium Sand Modified Folk: Gravelly Sand 14.0% Gravel 83.1% Sand 3.0% Mud	

Habitat Type	
JNCC: SS.SSa.CFiSa/SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25/A5.14	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Sp*irobranchus* sp. **Echinodermata** - *Luidia sarsi, Henricia* sp. **Other - Teleostei** - Gadiformes, Pleuronectiformes, *Limanda limanda, Glyptocephalus cynoglossus*, **Cnidaria** – Hydrozoa, **Bryozoa** - *Alcyonidium diaphanum*
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (139), *Lagis koreni* (45), *Eteone longa* (9), *Paramphinome jeffreysii* (7), *Goniada maculata* (5), *Pholoe baltica (sensu Petersen)* (5), *Nephtys* juv. (4), *Glycera* juv. (3), *Podarkeopsis capensis* (3), *Diplocirrus glaucus* (2) **Arthropoda (Crustacea)** - *Ampelisca tenuicornis* (4), *Ampelisca brevicornis* (3) **Mollusca** - *Cylichna cylindracea* (5), *Nucula nitidosa* (4), *Angulus fabula* (3), *Phaxas pellucidus* (3), *Philine* (3), *Abra prismatica* (2), *Lucinoma borealis* (2), *Dosinia* juv. (2) **Echinodermata** - Ophiuroidea juv. (14), *Echinocyamus pusillus* (7) **Other - Cnidaria** - *Cerianthus lloydii* (3), **Nemertea** (6), **Phoronida** - *Phoronis* (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Nematoda**

STATION TCC_57

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	29m	
Zone	Circalittoral	
Block	UKCS 37/27	
Target Location	394187 E	6102773 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 98.6% Sand 1.3% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Other - Teleostei** – Pleuronectiformes, *Limanda limanda*
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (15), *Galathowenia oculata* (2), *Nephtys cirrosa* (6), *Goniada maculata* (2), *Nephtys* juv. (3) **Mollusca** - *Tellimya ferruginosa* (2) **Echinodermata** - Asteroidea juv. (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_58

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Water Depth	28m	
Zone	Circalittoral	
Block	UKCS 37/27	
Target Location	395029 E	6102913 N
Estimated sediment type from seabed imagery	Gravelly sand	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Paguridae **Other - Teleostei** – Gadidae, Scorpaeniformes, Ammodytidae, **Urchordata** - Ascidiacea **Cnidaria** - Scyphozoa
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

STATION TCC_59

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Water Depth	32m	
Zone	Circalittoral	
Block	UKCS 37/27	
Target Location	396393 E	6104117 N
Estimated sediment type from seabed imagery	Fine to coarse sand	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Echinodermata** - *Asterias rubens* **Other - Teleostei** - Ammodytidae, **Cnidaria** - Pennatulacea
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_60

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Water Depth	34m	
Zone	Circalittoral	
Block	UKCS 37/27	
Target Location	396774 E	6104217 N
Estimated sediment type from seabed imagery	Gravelly sand	
PSA		

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** – Paguridae, Brachyura **Echinodermata** - Holothuroidea **Other - Teleostei** - Pleuronectiformes, **Cnidaria** - Actiniaria
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_61

Physical Environment		
Target Water Depth	6m	
Zone	Infralittoral	
Block	UKCS 41/11	
Target Location	241817 E	6057860 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk: 0.1% Gravel 96.4% Sand 3.6% Mud	Fine Sand Slightly Gravelly Sand

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaeta **Arthropoda (Crustacea)** - Caridea **Echinodermata** - Asteroidea
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Magelona johnstoni* (23), *Chaetozone christiei* (2), *Nephtys* juv. (2) **Arthropoda (Crustacea)** - *Bathyporeia elegans* (3), *Diastylis bradyi* (3) **Mollusca** - *Angulus fabula* (6), *Tellimya ferruginosa* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.IFiSa	Infralittoral fine sand
EUNIS: A5.23	

STATION TCC_62

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	10m	
Zone	Infralittoral	
Block	UKCS 41/11	
Target Location	243201 E	6057940 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 96.2% Sand 3.7% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Echinodermata -** Echinoidea **Other - Teleostei** - Soleidae
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Magelona johnstoni* (6), *Sigalion mathildae* (2), *Nephtys* juv. (2) **Arthropoda (Crustacea)** - *Bathyporeia elegans* (3) **Mollusca** - Mactridae juv. (6), *Angulus fabula* (5), *Chamelea striatula* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.IFiSa	Infralittoral fine sand
EUNIS: A5.23	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_63

Physical Environment		
Target Water Depth	15m	
Zone	Circalittoral	
Block	UKCS 41/11	
Target Location	244104 E	6058301 N
Estimated sediment type from seabed imagery	Gravelly, sandy bedrock and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Cirripedia, Brachyura, Caridea **Echinodermata** - Asteroidea, *Asterias rubens* **Other - Bryozoa**, **Teleostei** - Pleuronectiformes, **Cnidaria** - Hydrozoa, Sertulariidae, *Alcyonium* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: CR.MCR.EcCr.FaAlCr (Possibly CR.MCR.EcCr.FaAlCr.Pom)	Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock (Possibly Faunal and algal crusts with *Pomatoceros triqueter* and sparse *Alcyonium* sp. on exposed to moderately wave-exposed circalittoral rock)
EUNIS: A4.214 (Possibly A4.2145)	

STATION TCC_64

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	15m	
Zone	Infralittoral	
Block	UKCS 41/11	
Target Location	245388 E	6057920 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.3% Gravel 96.9% Sand 2.8% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Echinodermata** - Echinoidea **Other - Teleostei** - Pleuronectiformes
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Magelona johnstoni* (5), *Magelona filiformis* (4), *Glycinde nordmanni* (2), *Nephtys* juv. (2), *Sigalion squamosus* (2) **Arthropoda (Crustacea)** - Corophiidae (4), *Bathyporeia elegans* (3), *Bathyporeia* (2) **Mollusca** - *Abra prismatica* (11), *Angulus fabula* (4) **Echinodermata** - Echinoidea juv. (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Flustra foliacea*

Habitat Type	
JNCC: SS.SSa.IFiSa	Infralittoral fine sand
EUNIS: A5.23	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_65

Physical Environment		
Target Water Depth	18m	
Zone	Infralittoral/Circalittoral	
Block	UKCS 41/11	
Target Location	246631 E	6057439 N
Estimated sediment type from seabed imagery	Gravelly, sandy bedrock and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Sp*irobranchus* sp. **Arthropoda (Crustacea)** –Caridea, Cirripedia, **Echinodermata** – *Asterias rubens, Echinus esculentus* **Othere - Bryozoa** - *Flustra foliacea, Flustra foliacea*, **Cnidaria** – Sertulariidae, Hydrozoa, *Alcyonium* sp., **Porifera**
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: CR.MCR.EcCr.FaAlCr (Possibly CR.MCR.EcCr.FaAlCr.Flu)	Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock (Possibly *Flustra foliacea* on slightly scoured silty circalittoral rock)
EUNIS: A4.214 (Possibly A4.2141)	

STATION TCC_66

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	26m	
Zone	Circalittoral	
Block	UKCS 41/11	
Target Location	248076 E	6057740 N
Estimated sediment type from seabed imagery	Gravelly, sandy bedrock and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - *Ebalia* sp., possible Brachyura, possible Caridea **Echinodermata** - Ophiuroidea*, Echinus esculentus* **Other - Bryozoa** -*Flustra foliacea*, **Cnidaria** - Hydrozoa, Sertulariidae, *Alcyonium* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: CR.MCR.EcCr.FaAlCr	Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A4.214	

STATION TCC_67

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	26m	
Zone	Circalittoral	
Block	UKCS 41/11	
Target Location	249099 E	6057800 N
Estimated sediment type from seabed imagery	Gravelly, sandy bedrock and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Sp*irobranchus* sp. **Echinodermata** –*Asterias rubens,* Ophiuroidea **Other - Bryozoa** - *Flustra foliacea*, **Cnidaria** - *Alcyonium* sp., **Porifera** - Porifera
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: CR.MCR.EcCr.FaAlCr.Flu	*Flustra foliacea* on slightly scoured silty circalittoral rock
EUNIS: A4.2141	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_68

Physical Environment		
Target Water Depth	35m	
Zone	Circalittoral	
Block	UKCS 41/11	
Target Location	251064 E	6058341 N
Estimated sediment type from seabed imagery	Gravelly, sandy bedrock and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Galatheidae, Caridea **Echinodermata** - Ophiuroidea, Ophiura, *Echinus esculentus* **Other - Bryozoa** - *Flustra foliacea*, **Teleostei** – Ascideacea, **Cnidaria** - Hydrozoa*, Alcyonium* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: CR.MCR.EcCr.FaAlCr (Possibly CR.MCR.EcCr.FaAlCr.Pom)	Faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock (Possibly faunal and algal crusts with *Pomatoceros triqueter* and sparse *Alcyonium* sp. on exposed to moderately wave-exposed circalittoral rock)
EUNIS: A4.214 (Possibly A4.2145)	

STATION TCC_69

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	32m	
Zone	Circalittoral	
Block	UKCS 41/11	
Target Location	251064 E	6058061 N
Estimated sediment type from seabed imagery	Sandy gravel	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp., Sabellidae **Arthropoda (Crustacea)** - Paguridae, Caridea **Echinodermata** - Asteroidea, *Asterias rubens,* Ophiuroidea*, Ophiothrix fragilis* **Other - Bryozoa** - *Flustra foliacea*, **Cnidaria** - Hydrozoa*, Alcyonium* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

STATION TCC_70

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	38m	
Zone	Circalittoral	
Block	UKCS 41/11	
Target Location	252850 E	6059124 N
Estimated sediment type from seabed imagery	Gravelly, sandy bedrock with cobbles	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Caridea **Echinodermata** - *Asterias rubens,* Ophiuroidea*, Ophiothrix fragilis* **Other - Bryozoa** - *Flustra foliacea,* **Cnidaria** - *Thuiaria thuja,* Hydrozoa*, Alcyonium* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS / CR.MCR.EcCr.FaAlCr	Circalittoral coarse sediment with patches of faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A5.14 / A4.214	

STATION TCC_71

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	46m	
Zone	Circalittoral	
Block	UKCS 41/12	
Target Location	255116 E	6059104 N
Estimated sediment type from seabed imagery	Gravelly sand with cobbles and occasional boulders	
PSA	Very Poorly Sorted Wentworth: Medium Sand Modified Folk: Gravelly Muddy Sand 16.1% Gravel 63.2% Sand 20.7% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** -Paguridae, Caridea **Echinodermata** - Ophiuroidea, Ophiurae, *Ophiothrix fragilis* **Other - Bryozoa** - *Flustra foliacea*, **Cnidaria** - *Alcyonium* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Lumbrineris cingulata* (25), *Peresiella clymenoides* (10), *Owenia fusiformis* (7), *Glycera lapidum* (4), *Ampharete lindstroemi* (3), Ampharetidae (2), *Aonides paucibranchiata* (2), *Exogone (Exogone) Verugera* (2), *Ophelina acuminata* (2), Sp*haerosyllis taylori* (2) **Arthropoda (Crustacea)** - *Ampelisca* sp*inipes* (6), *Bodotria scorpioides* (3), *Ampelisca* (2), *Liocarcinus* juv. (2) **Mollusca** - *Dosinia* juv. (3) **Echinodermata** - Ophiuroidea juv. (5), *Amphiura filiformis* (4), *Echinocyamus pusillus* (4) **Other - Cnidaria** - *Cerianthus lloydii* (4), **Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SMx.CMx	Circalittoral mixed sediment
EUNIS: A5.44	

STATION TCC_72

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	46m	
Zone	Circalittoral	
Block	UKCS 41/12	
Target Location	258205 E	6060046 N
Estimated sediment type from seabed imagery	Sandy gravel with cobbles and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Caridea, Paguridae, Galatheidae **Mollusca** - Bivalvia **Echinodermata** - Asteroidea, Ophiuroidea, Ophiurae, *Ophiothrix fragilis,Echinus esculentus,* **Other - Bryozoa** - *Flustra foliacea*, **Cnidaria** - Hydrozoa, *Thuiaria thuja, Alcyonium* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS / CR.MCR.EcCr.FaAlCr	Circalittoral coarse sediment with patches of faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A5.14 / A4.214	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_73

Physical Environment		
Target Water Depth	48m	
Zone	Circalittoral	
Block	UKCS 41/12	
Target Location	260432 E	6060407 N
Estimated sediment type from seabed imagery	Sandy gravel	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Caridea, *Ebalia* sp., Paguridae **Echinodermata** - Ophiuroidea **Other - Cnidaria** - Hydrozoa, Sertulariidae, *Thuiaria thuja, Alcyonium* sp., **Teleostei** - Gobiidae
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

STATION TCC_74

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	51m	
Zone	Offshore Circalittoral	
Block	UKCS 41/12	
Target Location	264243 E	6059144 E
Estimated sediment type from seabed imagery	Sandy gravel with cobbles and occasional boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Caridea **Echinodermata** – Ophiuroidea, *Ophiothrix fragilis*, Ophiurae **Other - Cnidaria** – Hydrozoa, Sertulariidae
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS / CR.MCR.EcCr.FaAlCr	Circalittoral coarse sediment with patches of faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A5.14 / A4.214	

STATION TCC_75

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	54m	
Zone	Circalittoral	
Block	UKCS 41/12	
Target Location	264925 E	6060026 E
Estimated sediment type from seabed imagery	Fine to coarse sand with patches of shell fragments	
PSA	Very Poorly Sorted Wentworth: Modified Folk:	 Coarse Sand Muddy Sandy Gravel 31.8% Gravel 58.4% Sand 9.8% Mud

Habitat Type	
JNCC: SS.SMx.CMx	Circalittoral mixed sediment
EUNIS: A5.44	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp., polychaete tubes **Echinodermata** - Ophiuroidea
Dominant fauna from biology data	**Annelida (Polychaeta)** – Sp*irobranchus triqueter* (35), *Terebellides stroemii* (19), *Hydroides norvgicus* (16), *Trichobranchus roseus* (12), *Lumbrineris cingulata* (8), *Eupolymnia nesidensis* (7), Serpuidae (7), Sp*irobranchus* sp (5), *Glycera lapidum* (4), *Chone dunerificta* (3), *Eumida* sp (3), *Peresiella clymenoides* (3), *Polycirrus* sp (3), Polynoidae juv. (3), *Minuspio cirrifera* (2), *Pherusa plumosa* (2), *Phisidia aurea* (2), Sp*iophanes kroyeri* (2) **Arthropoda (Crustacea)** - *Galathea* sp juv. (23), *Galathea intermedia* (5), *Liocarcinus holsatus* (2) **Mollucsa** - *Leptochiton asellus* (5), *Facelina* (2), *Nucula nucleus* (2), *Parvicardium pinnulatum* (2) **Echinodermata** - *Echinocyamus pusillus* (8), Echinoidea juv. (4), Ophiuroidea juv. (3), *Leptosynapta inhaerens* (2) **Other - Cnidaria** - *Cerianthus lloydii* (2), **Nemertea** (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Alcyonidium parasiticum*, **Cnidaria** - *Halecium*, *Abietinaria abietina*, *Alcyonium* sp.

STATION TCC_76

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	55m	
Zone	Circalittoral	
Block	UKCS 41/12	
Target Location	267212 E	6059545 E
Estimated sediment type from seabed imagery	Fine to medium sand with gravel and pebbles	
PSA	Very Poorly Sorted Wentworth: Fine Gravel Modified Folk: Muddy Sandy Gravel 61.5% Gravel 33.5% Sand 5.0% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** – Paguridae, Majidae, Caridea **Echinodermata** – Ophiuroidea, Echinoidea **Cnidaria** - *Alcyonium* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*inobranchus triqueter* (24), Sp*irobranchus* sp. (19), *Hydroides norvegicus* (5), *Lumbrineris cingulata* (5), *Magelona filiformis* (2), *Glycera lapidum* (3) **Arthropoda (Crustacea)** - *Galathea* juv. (2), **Mollusca** - Polyplacophora juv. (2) **Echinodermata** - *Echinocyamus pusillus* (9), *Leptosynapta* (2), Ophiuridae juv. (2) **Other - Cnidaria** - Edwardsiidae (4), *Cerianthus lloydii* (3), **Nemertea** (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Cnidaria** - *Sertularia*, *Sertularis distans*, Campanulariidae

Habitat Type	
JNCC: SS.SMx.CMx	Circalittoral mixed sediment
EUNIS: A5.44	

STATION TCC_77

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	54m	
Zone	Circalittoral	
Block	UKCS 41/13	
Target Location	268937 E	6060147 N
Estimated sediment type from seabed imagery	Sandy gravel and pebbles	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Sp*irobranchus* sp. **Arthropoda (Crustacea)** – Paguridae, Galatheidae **Echinodermata** - *Asterias rubens,* Ophiuroidea, Echinoidea **Other - Cnidaria** - Hydrozoa, *Alcyonium* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS	Circalittoral coarse sediment
EUNIS: A5.14	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_78

Physical Environment		
Target Water Depth	57m	
Zone	Circalittoral	
Block	UKCS 41/13	
Target Target Location	270622 E	6063256 N
Estimated sediment type from seabed imagery	Fine to medium sand with patches of coarse sediment and shell fragments	
PSA	Poorly Sorted Wentworth: Medium Sand Modified Folk: Gravelly Sand 7.2% Gravel 91.5% Sand 1.2% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polycheate tubes **Arthropoda (Crustacea)** – Paguridae **Mollusca** - Scaphopoda **Other - Cnidaria** - *Alcyonium* sp., Hydrozoa, Sertulariidae, **Porifera**
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Galathowenia oculata* (11), *Aricidea simonae* (6), *Ophelia borealis* (5), *Spiophanes bombyx* (3), *Glycera lapidum* (2), *Scolelepis* (2), *Owenia fusiformis* (2), *Polycirrus* (2) **Arthropoda (Crustacea)** - *Ampelisca spinipes* (2) **Mollusca** *Abra prismatica* (3) **Echinodermata** *Echinocyamus pusillus* (16) **Other - Nemertea** (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** *Crisia, Alcyonidium parasiticum, Eucratea loricata, Scrupocellaria scabra*, **Cnidaria** - *Sertularella, Alcyonium* sp.

Habitat Type	
JNCC: SS.SSa.CFiSa/SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25/A5.14	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_79

Physical Environment		
Target Water Depth	58m	
Zone	Circalittoral	
Block	UKCS 41/13	
Target Target Location	274152 E	6063035 N
Estimated sediment type from seabed imagery	Fine to medium sand with patches of coarse sediment and shell fragments	
PSA	Moderately Sorted Wentworth: Modified Folk: 1.3% Gravel 96.9% Sand 1.8% Mud	 Medium Sand Slightly Gravelly Sand

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Mollusca** – Scaphopoda, Bivalvia **Arthropoda (Crustacea)** – Paguridae **Echinodermata** – *Echinocardium* sp. **Other - Cnidaria** - *Alcyonium* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Glycera* juv. (6), Sp*iophanes bombyx* (5), *Ophelia borealis* (5), *Myriochele danielsseni* (4), *Aricidea* (*Acmira*) *catherinae* (2) **Arthropoda (Crustacea)** - *Bathyporeia gracilis* (4) **Mollusca** *Abra* juv. (3), *Phaxas pellucidus* (2) **Echinodermata** *Echinocyamus pusillus* (17), Ophiuroidea juv. (2) **Other - Nemertea** (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa/SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25/A5.14	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_80

Physical Environment		
Target Water Depth	58m	
Zone	Circalittoral	
Block	UKCS 41/13	
Target Target Location	275075 E	6063055 N
Estimated sediment type from seabed imagery	Fine to medium sand with patches of coarse sediment and shell fragments	
PSA	Poorly Sorted Wentworth: Coarse Sand Modified Folk: Gravelly Sand 19.0% Gravel 78.9% Sand 2.1% Mud	

Habitat Type	
JNCC: SS.SSa.CFiSa/SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25/A5.14	

Biology	
Fauna from seabed imagery	**Annelida (Polychaete)** - Polychaete tubes, Sp*irobranchus* sp. **Echinodermata** *Asterias rubens*, *Henricia* sp., Spatangoida **Other - Bryzoa** *Flustra foliacea*, **Teleostei** - *Solea* sp., **Cnidaria** - Actiniaria, *Alcyonium* sp., Hydrozoa,*Tubularia* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (9), *Galathowenia oculata* (6), *Ophelia borealis* (5), *Paramphinome jeffreysii* (4), Sp*iophanes kroyeri* (2) **Arthropoda (Crustacea)** - *Urothoe elegans* (3), *Sarsinebalia urgorrii* (2) **Mollusca** *Cochlodesma praetenue (2),* **Echinodermata** *Echinocyamus pusillus* (7), *Echinocardium flavescens* (2), *Pseudothyone raphanus* (2) **Other - Cnidaria** - Actiniaria (6), *Cerianthus lloydii* (2), **Formanifera** - *Astrorhiza* (4), **Phoronida** - *Phoronis* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Eucratea loricata*

STATION TCC_81

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	56m	
Zone	Circalittoral	
Block	UKCS 41/13	
Target Target Location	275657 E	6063256 N
Estimated sediment type from seabed imagery	Fine to medium sand with patches of coarse sediment and areas of cobbles and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Sp*irobranchus* sp. **Arthropoda (Crustacea)** - *Munida* sp., Paguridae, Caridea, **Mollusca** - Scaphopoda **Echinodermata** - Asteroidea, *Asterias rubens*, *Henricia* sp., *Echinus* sp., Ophiuroidea, *Ophiothrix fragilis*, Ophiurae, *Psammechinus* sp. **Other - Bryzoa** *Flustra foliacea*, **Teleostei**, **Cnidaria** Actiniaria, *Alcyonium* sp., Hydrozoa, Sertulariidae, *Tubularia* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS. SCS.CCS / CR.MCR.EcCr.FaAlCr	Circalittoral coarse sediment with patches of faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A5.14 / A4.214	

STATION TCC_82

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	59m	
Zone	Circalittoral	
Block	UKCS 41/8	
Target Target Location	279849 E	6063517 N
Estimated sediment type from seabed imagery	Fine to medium sand with some shell fragments	
PSA	Moderately Sorted Wentworth: Modified Folk:	 Medium Sand Slightly Gravelly Sand 1.0% Gravel 97.6% Sand 1.4% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes, Nephtyidae **Arthropoda (Crustacea)** – Paguridae **Mollusca** – Bivalvia, Solenidae, Scaphopoda **Echinodermata** - Asteroidea, Ophiuroidea **Other - Teleostei** - Pleuronectiformes, *Lophius piscatorius*, **Cnidaria** - *Alcyonium* sp., Pennatulacea, **Porifera** - Porifera
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Ophelia borealis* (11), *Paramphinome jeffreysii* (4), *Chaetozone christiei* (3), *Glycera lapidum* (3), *Scoloplos (Scoloplos) armiger* (3), *Spiophanes bombyx (*2) **Arthropoda (Crustacea)** - *Bathyporeia elegans* (3) **Mollusca** - *Kurtiella bidentata* (4), *Abra prismatica* (3) **Echinodermata** - *Echinocyamus pusillus* (9), *Amphiura filiformis* (5), Ophiuroidea juv. (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Eucratea loricata*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_83

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	56m	
Zone	Circalittoral	
Block	UKCS 41/8	
Target Target Location	280571 E	6063717 N
Estimated sediment type from seabed imagery	Fine to medium sand with shell fragments, gravel, occasional cobbles and boulders	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Sabellidae **Arthropoda (Crustacea)** - *Cancer pagurus* **Echinodermata** - *Echinus esculentus*, *Henricia* sp., *Asterias rubens* **Other - Bryozoa** *Flustra foliacea*, **Teleostei** Pleuronectiformes, **Cnidaria** Actiniaria, *Alcyonium* sp., Hydrozoa, Plumulariidae
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS. SCS.CCS / CR.MCR.EcCr.FaAlCr	Circalittoral coarse sediment with patches of faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A5.14 / A4.214	

STATION TCC_84

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	61m	
Zone	Circalittoral	
Block	UKCS 41/9	
Target Target Location	284583 E	6065021 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand*****
		0.0% Gravel 98.4% Sand 1.5% Mud

*** Classified as Slightly Gravelly Sand in GRADISTAT analysis due to <0.1% Very Fine Gravel**

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Echinodermata** – *Echinocardium* sp. **Other - Cnidaria** - Hydrozoa, **Porifera** - Porifera
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Scoloplos (Scoloplos) armiger* (6), *Chaetozone christiei* (4), *Diplocirrus glaucus* (2), *Sthenelais limicola* (2) **Mollusca** - *Tellimya ferruginosa* (3), *Kurtiella bidentata* (2), *Nucula nitidosa* (2) **Other - Formanifera** - *Astrorhiza* (3), **Phoronida** - *Phoronis* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Alcyonidium parasiticum*

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_85

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	66m	
Zone	Circalittoral	
Block	UKCS 41/9	
Target Target Location	286188 E	6065242 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk: 0.1% Gravel 98.7% Sand 1.3% Mud	Fine Sand Slightly Gravelly Sand

Biology	
Fauna from seabed imagery	**Annelida (Polychaete)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Echinodermata** - *Asterias rubens*, Ophiuroidea
Dominant fauna from biology data	**Annelida (Polycheata)** - *Scoloplos (Scoloplos) armiger* (4), *Chaetozone setosa* (3), *Paramphinome jeffreysii* (2), Sp*iophanes bombyx* (2) **Mollusca (Crustacea)** - *Abra prismatica* (4), *Chamelea striatula* (3*), Nucula nitidosa* (2) **Echinodermata** - Ophiuroidea juv. (7), Echinoidea juv. (4), *Echinocyamus pusillus* (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_86

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	67m	
Zone	Circalittoral	
Block	UKCS 41/9	
Target Target Location	291664 E	6065743 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 98.3% Sand 1.6% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes, polychaeta **Arthropoda (Crustacea)** - Caridea **Mollusca** – Bivalvia **Echinodermata** - Ophiuroidea **Other - Cnidaria** - Hydrozoa, *Epizoanthus papillosus, Pennatula phosphorea*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Scoloplos* (*Scoloplos*) *armiger* (7), *Galathowenia oculata* (2) **Mollusca** - *Phaxas pellucidus* (3), *Abra* juv.(2) **Echinodermata** - Echinoidea juv.(2) **Other - Phoronida** – *Phoronis* (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_87

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	63m	
Zone	Circalittoral	
Block	UKCS 41/10	
Target Target Location	300631 E	6066887 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.2% Gravel 97.2% Sand 2.5% Mud	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaeta, polychaete tubes **Mollusca** - Bivalvia **Echinodermata** - *Luidia* sp., Ophiuroidea, *Echinocardium* sp. **Other** - **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Galathowenia oculata* (13), *Scoloplos (Scoloplos) armiger* (9), *Paramphinome jeffreysii* (7), *Owenia fusiformis* (4), *Scolelepis korsuni* (2). **Arthropoda (Crustacea)** - *Ennucula tenuis* (5), *Kurtiella bidentata* (4), *Philine*(2) **Echinodermata** - Ophiuroidea juv. (17), Echinoidea juv. (6), *Amphiura filiformis* (3) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (16)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_88

Physical Environment		
Target Water Depth	71m	
Zone	Circalittoral	
Block	UKCS 41/10	
Target Target Location	304783 E	6066706 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** – Polychaete tubes **Other - Cnidaria** - *Alcyonium* sp., **Foraminifera -** *Astrorhiza* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_89

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	71m	
Zone	Circalittoral	
Block	UKCS 42/6	
Target Target Location	307310 E	6066746 N
Estimated sediment type from photos/ video	Fine to medium sand with patches of coarse sediment and boulders	
PSA	-	

Biology	
Fauna from photos	**Annelida (Polychaeta)** - Sp*irobranchus* sp., *Oxydromus flexuosus*, polychaete tubes **Arthropoda (Crustacea)** - Caridea, *Munida* sp. **Echinodermata** – Ophiurae **Mollusca** - Scaphopoda **Other - Bryozoa** - Vesiculariidae, *Flustra foliacea*, **Cnideria** - *Alcyonium* sp., *Virgularia mirabilis* , Hydrozoa, *Thuiaria thuja*, Sertulariidae, Tubulariidae, **Foraminifera** - *Astrorhiza* sp., **Porifera** - Porifera
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS. SCS.CCS / CR.MCR.EcCr.FaAlCr	Circalittoral coarse sediment with patches of faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A5.14 / A4.214	

STATION TCC_90

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	73m	
Zone	Circalittoral	
Block	UKCS 42/6	
Target Target Location	309236 E	6066867 N
Estimated sediment type from photos/ video	Fine to medium sand	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.1% Gravel 97.4% Sand 2.5% Mud	

Habitat Type	
JNCC: SS.SSa.CfiSa **(Possibly SS.SSa.CFiSa.EpusOborApri)**	Circalittoral fine sand (Possibly *Echinocyamus pusillus, Ophelia borealis* and *Abra prismatica* in circalittoral fine sand)
EUNIS: A5.25 **(Possibly A.5.251)**	

Biology	
Fauna from photos	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - *Cancer pagurus* **Other - Teleostei** - *Callionymus lyra*, **Cnideria** - Hydrozoa, *Alcyonium* sp., **Foraminifera** - *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Galathowenia oculata* (7), Sp*iophanes bombyx* (4), *Chaetozone christiei* (3), *Owenia fusiformis* (3), *Sthenelais limicola* (2), *Nephtys caeca* (2) **Arthropoda (Crustacea)** - *Ampelisca macrocephala* (2) **Mollusca** - *Ennucula tenuis* (7)*, Kurtiella bidentata* (5) **Echinodermata** - *Amphiura filiformis* (2), *Echinocyamus pusillus* (5) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astorhiza* (9), **Phoronida** - *Phoronis* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

STATION TCC_91

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	62m	
Zone	Circalittoral	
Block	UKCS 42/6	
Target Target Location	309738 E	6067789 N
Estimated sediment type from photos/ video	Fine to medium sand with patches of coarse sediment and boulders	
PSA	-	

Biology	
Fauna from photos	**Annelida (Polychatea)** – Polychaete tubes, Sp*irobranchus* sp. **Arthropoda (Crustacea)** - Caridea, *Munida* sp., Paguridae **Mollusca** - *Aequipecten opercularis,* Scaphopoda **Echinodermata** – Ophiuroidea **Other - Bryozoa** - *Flustra foliacea*, **Teleostei**, **Cnideria** - Hydrozoa, *Alcyonium* sp., Actiniara, **Foraminifera** - *Astrorhiza* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS / CR.MCR.EcCr.FaAlCr	Circalittoral coarse sediment with patches of faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A5.14 / A4.214	

STATION TCC_92

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	66m	
Zone	Circalittoral	
Block	UKCS 42/6	
Target Target Location	310400 E	6067829 N
Estimated sediment type from photos/ video	Fine to medium sand	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.2% Gravel 97.3% Sand 2.5% Mud	

Habitat Type	
JNCC: SS.SSa.CfiSa	Circalittoral fine sand
EUNIS: A5.25	

Biology	
Fauna from photos	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - Paguridae, Caridea **Echinodermata** - *Asterias rubens* **Other – Teleostei** – Pleuronectiformes, **Cnideria** – Hydrozoa, *Virgularia mirabilis, Alcyonium* sp., **Foraminifera** - *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Owenia fusiformis* (8), *Galathowenia oculata* (5), *Ophelia borealis* (3), *Goniada maculata* (2), *Nephtys cirrosa* (2), *Paramphinome jeffreysii* (2) **Arthropoda (Crustacea)** - *Bathyporeia elegans* (2), *Harpinia antennaria* (2) **Mollusca** - *Ennucula tenuis* (4) **Echinodermata** - Echinoidea juv. (12), *Echinocyamus pusillus* (6), Ophiuroidea juv. (5) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astorhiza* (12)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Eucratea loricata*, *Callopora dumerilii*

STATION TCC_93

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	67m	
Zone	Circalittoral	
Block	UKCS 42/6	
Target Target Location	311162 E	6067950 N
Estimated sediment type from photos/ video	Fine to medium sand and patches of coarse sediment	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.2% Gravel 98.0% Sand 1.8% Mud	

Biology	
Fauna from photos	**Annelida (Polychaeta)** – Polychaete tubes **Other - Bryozoa** – *Flustra foliacea*, **Cnideria** - *Urticina* sp., *Alcyonium* sp., **Foraminifera** - *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Galathowenia oculata* (7), *Myriochele danielsseni* (3), *Owenia fusiformis* (3), *Heteromastus filiformis* (2), *Paramphinome jeffreysii* (2), *Scoloplos (Scoloplos) armiger* (3), Sp*iophanes bombyx* (2) **Arthropoda (Crustacea)** - *Harpinia antennaria* (7) **Mollusca** – *Chamelea striatula* (3), *Abra nitida* (2) *Philine* (2) **Echinodermata** – Ophiuroidea juv. (8), Echinoidea juv. (7), *Echinocyamus pusillus* (3) **Other - Formanifera** – *Astorhiza* (6)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CfiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_94

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	71m	
Zone	Circalittoral	
Block	UKCS 42/6	
Target Target Location	311964 E	6068110 N
Estimated sediment type from photos/ video	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 97.7% Sand 2.2% Mud

Biology	
Fauna from photos	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - Paguridae, Portunidae **Echinodermata** – Asteroidea **Other - Teleostei** – Pleuronectiformes **Cnideria** - Hydrozoa, Actiniaria, *Virgularia mirabilis, Alcyonium* sp., **Foraminfera** - *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Scoloplos (Scoloplos) armiger* (4), Spiophanes *bombyx* (4), *Galathowenia oculata* (4), *Owenia fusiformis* (4) *Chaetozone christiei* (3), *Aonides paucibranchiata* (2) **Arthropoda (Crustacea)** - *Harpinia antennaria* (5) **Mollusca** - *Ennucula tenuis* (4) **Echinodermata** - Ophiuroidea juv. (8), Echinoidea juv. (6), *Echinocyamus pusillus* (4) **Other - Formainfera** - *Astrorhiza* (9)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Hydroza** - *Clytia hemisphaerica*

Habitat Type	
JNCC: SS.SSa.CfiSa	Circalittoral fine sand
EUNIS: A5.25	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_95

Physical Environment		
Target Water Depth	70m	
Zone	Circalittoral	
Block	UKCS 42/6	
Target Target Location	314271 E	6067468 N
Estimated sediment type from photos/ video	Fine to medium sand	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.1% Gravel 98.3% Sand 1.6% Mud	

Biology	
Fauna from photos	**Annelida (Polychaeta)** – Polychaete tubes **Echinodermata** - *Asterias rubens, Astropecten irregularis* **Other - Teleostei**, **Cnideria** - Sertulariidae, Hydrozoa, *Virgularia mirabilis*, *Alcyonium* sp., **Foraminifera** - *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Scoloplos (Scoloplos) armiger* (7), *Paramphinome jeffreysii* (4), *Owenia fusiformis* (3), *Sthenelais limicola* (3), *Scolelepis korsuni* (3), Spiophanes *bombyx* (3), *Ampharete falcata* (2), *Nephtys caeca* (2) **Arthropoda (Crustacea)** - *Bathyporeia gracilis* (2), *Bathyporeia tenuipes* (2) **Mollusca** - *Ennucula tenuis* (4), *Philine* (3), *Abra* juv. (2), *Cylichna cylindracea* (2) **Echinodermata** -Echinoidea juv. (5), *Echinocyamus pusillus* (5), Ophiuridae juv. (2) **Other - Formainfera** - *Astrorhiza* (11)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Hydrozoa** - *Clytia hemisphaerica*

Habitat Type	
JNCC: SS.SSa.CfiSa	Circalittoral fine sand
EUNIS: A5.25	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_96

Physical Environment		
Target Water Depth	70m	
Zone	Circalittoral	
Block	UKCS 42/6	
Target Target Location	315595 E	6068592 N
Estimated sediment type from photos/ video	Fine to medium sand with patches of coarse sediment and occasional boulders	
PSA	-	

Biology	
Fauna from photos	**Annelida (Polychaeta)** - Sp*irobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** - Paguridae, Caridea, **Echinodermata** - *Astropecten irregularis*, *Asterias rubens,* Ophiuroidea **Other - Bryozoa** - *Flustra foliacea*, **Teleostei**, **Cnideria** - *Alcyonium* sp., Hydrozoa, Sertulariidae, *Pennatula phosphorea* **Formanifera** - *Astrorhiza* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CfiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

STATION TCC_97

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	67m	
Zone	Circalittoral / Offshore Circalittoral	
Block	UKCS 42/6	
Target Target Location	315956 E	6068632 N
Estimated sediment type from photos/ video	Fine to medium sand	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 1.1% Gravel 95.9% Sand 3.0% Mud	

Biology	
Fauna from photos	**Annelida (Polychaeta)** - Aphroditinae, polychaete tubes **Arthropoda (Crustacea)** – Caridea, Paguridae **Echinodermata** - *Astropecten irregularis* **Other - Cnideria** - *Alcyonium* sp., *Pennatula phosphorea*, **Foraminifera** - *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Ophelia borealis* (6), *Owenia fusiformis* (4), *Scoloplos (Scoloplos) armiger* (4), *Chaetozone christiei* (3), *Galathowenia oculata* (2), *Paramphinome jeffreysii* (2), *Scolelepis korsuni* (2) **Arthropoda (Crustacea)** - *Urothoe elegans* (2) **Mollusca** - *Ennucula tenuis* (2) **Echinodermata** - *Echinocyamus pusillus* (8), Ophiuroidea juv. (7), *Amphiura filiformis* (2) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* (10), **Nemertea** (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Bryozoa** - *Palmiskenea skenei*

Habitat Type	
JNCC: SS.SSa.CfiSa **(Possibly SS.Ssa.Osa.OfusAfil)**	Circalittoral fine sand (Possibly *Owenia fusiformis* and *Amphiura filiformis* in offshore circalittoral sand or muddy sand)
EUNIS: A5.25 **(Possibly A5.272)**	

STATION TCC_98

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	64m	
Zone	Circalittoral	
Block	UKCS 42/6	
Target Target Location	316357 E	6068752 N
Estimated sediment type from photos/ video	Fine to medium sand patches of coarse sediment including shell fragments, cobbles and boulders	
PSA	-	

Biology	
Fauna from photos	**Annelida (Polychaeta)** - Sp*irobranchus* sp., polychaete tubes **Arthropoda (Crustacea)** - Caridea, *Ebalia* sp., *Munida* sp., Paguridae **Mollusca** - Scaphopoda **Echinodermata** - Asteroidea, Ophiuroidea, *Echinus* sp. **Other - Bryozoa** - *Flustra foliacea,* **Teleostei** Gadidae, **Cnideria** - *Alcyonium* sp., Plumulariidae, *Abietinaria* sp., Actiniaria, **Foraminifera** - *Astrorhiza* sp. **Porifera** - Porifera
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SCS.CCS / CR.MCR.EcCr.FaAlCr	Circalittoral coarse sediment with patches of faunal and algal crusts on exposed to moderately wave-exposed circalittoral rock
EUNIS: A5.14 / A4.214	

STATION TCC_99

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	63m	
Zone	Circalittoral	
Block	UKCS 42/7	
Target Target Location	317501 E	6068953 N
Estimated sediment type from photos/ video	Fine to medium sand	
PSA	Moderately Well Sorted Wentworth: Fine Sand Modified Folk: Slightly Gravelly Sand 0.5% Gravel 96.4% Sand 3.0% Mud	

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

Biology	
Fauna from photos	**Annelida (Polychaeta)** - *Oxydromus flexuosus,* polychaete tubes **Arthropoda (Crustacea)** – Caridea, Paguridae **Mollusca** – *Aequipecten opercularis* **Other - Bryozoa** – *Flustra foliacea,* **Cnideria** – *Virgularia mirabilis*, **Foraminifera** - *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Scoloplos (Scoloplos) armiger* (7), *Aricidea (Acmira) catherinae* (4), *Paramphinome jeffreysii* (3), Spiophanes *bombyx* (3) **Arthropoda (Crustacea)** - *Harpinia antennaria* (2) **Mollusca** - *Kurtiella bidentata* (13), *Philine* (2), *Ennucula tenuis* (2) **Echinodermata** - Ophiuroidea juv. (11), Echinoidea juv. (5), *Echinocyamus pusillus* (3), *Amphiura filiformis* (2) **Other - Foraminifera -** *Astrorhiza* sp**.** - *Astrorhiza* sp. (11)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Hydrozoa** - Filifera

STATION TCC_100

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	66m	
Zone	Circalittoral	
Block	UKCS 42/7	
Target Location	320931 E	6069474 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.2% Gravel 97.7% Sand 2.1% Mud

Biology	
Fauna from seabed imagery and video	**Annelida (Polychaeta)** – Polychaeta, polychaete tubes **Arthropoda (Crustacea)** - Amphipoda, Paguridae, Caridea **Echinodermata** - Asteroidea **Other - Teleostei** - Gadidae, **Cnidaria** - Hydrozoa, *Pennatula phosphorea,* **Foraminifera** – *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Paramphinone jeffreysii* (4), *Scoloplos (Scoloplos) armiger* (4), *Sthenelais limicola* (3), *Chaetozone christiei* (2), Sp*iophanes bombyx* (2) **Arthropoda (Crustacea)** - *Eudorellopsis deformis* (2) **Mollusca** - *Chamelea Striatula* (2) **Echinodermata** - *Amphiura filiformis* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_101

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	69m	
Zone	Offshore Circalittoral	
Block	UKCS 42/7	
Target Location	326728 E	6071360 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk: 0.1% Gravel 96.8% Sand 3.2% Mud	 Fine Sand Slightly Gravelly Sand

Biology	
Fauna from seabed imagery and video	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - Brachyura **Echinodermata** - *Astropecten irregularis,* Ophiuroidea **Other - Teleostei** - Gadidae, **Cnidaria** - Hydrozoa, *Pennatula phosphorea*, **Foraminifera** *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Myriochele danielsseni* (5), *Owenia fusiformis* (3), *Sthenelais limicola* (3), *Chaetozone christiei* (2), *Galathowenia oculata* (2) **Echinodermata** - Ophiuroidea juv. (10)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_102

Physical Environment		
Target Water Depth	72m	
Zone	Circalittoral	
Block	UKCS 42/7	
Target Location	327731 E	6071721 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk: 0.1% Gravel 96.4% Sand 3.4% Mud	 Fine Sand Slightly Gravelly Sand

Biology	
Fauna from seabed imagery and video	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - *Ebalia* sp., Amphipoda **Echinodermata** - *Astropecten irregularis*, *Echinocardium* sp. **Mollusca** - Scaphopoda **Other - Cnidaria** - *Alcyonium* sp., *Pennatula phosphorea*, **Foraminifera** – *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Scoloplos (Scoloplos) armiger* (10), *Chaetozone setosa* (7), Spiophanes *bombyx* (4), *Paramphinome jeffreysii* (3), *Galathowenia oculata* (2) **Echinodermata** - Ophiuroidea juv. (36)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_103

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	77m	
Zone	Circalittoral / Offshore Circalittoral	
Block	UKCS 42/8	
Target Location	336537 E	6074950 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 95.1% Sand 4.8% Mud

Habitat Type	
JNCC: SS.SSa.CfiSa **(Possibly SS.Ssa.Osa.OfusAfil)**	Circalittoral fine sand (Possibly *Owenia fusiformis* and *Amphiura filiformis* in offshore circalittoral sand or muddy sand)
EUNIS: A5.25 **(Possibly A5.272)**	

Biology	
Fauna from seabed imagery and video	**Annelida (Polychaeta)** – Polychaete tubes **Other - Teleostei** - Gobiidae, **Cnidaria** - *Alcyonium* sp., *Pennatula phosphorea*, **Foraminifera** – *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Galathowenia oculata* (17), *Paramphinume jeffreysii* (14), *Scoloplos (Scoloplos) armiger* (12), *Owenia fusiformis* (5), *Praxillella affinis* (4), Spiophanes *bombyx* (4), *Chaetozone setosa* (3), *Sthenelais limicola* (3), Ampharetidae (2), *Goniada maculata* (2), *Myriochele danielsseni* (2), Spiophanes *kroyeri* (2) **Arthropoda (Crustacea)** - *Harpinia antennaria* (4), Crangonidae (2), *Diastylis bradyi* (2), *Hippomedon denticulatus* (2) **Mollusca** - *Phaxas pellucidus* (4), *Thyasira flexuosa* (3), *Chaetoderma nitidulum* (2), *Thyasira equalis* (2) **Echinodermata** - Ophiuroidea juv. (21), *Amphiura filiformis* (8), Echinoidea juv. (7), *Pseudothyone raphanus* (3) **Other - Nemertea** (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_104

Physical Environment		
Target Water Depth	80m	
Zone	Offshore Circalittoral	
Block	UKCS 42/8	
Target Location	342474 E	6074429 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	-	

Biology	
Fauna from seabed imagery and video	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - *Ebalia* sp. **Echinodermata** - Asteroidea **Other - Teleostei** - Callionymidae, **Cnidaria** - *Alcyonium* sp., *Pennatula phosphorea*, **Ctenophora**, **Foraminifera** – *Astrorhiza* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_105

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	76m	
Zone	Offshore Circalittoral	
Block	UKCS 42/8	
Target Location	343397 E	6074449 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	-	

Biology	
Fauna from seabed imagery and video	**Annelida (Polychaeta)** – Polychaete tubes Aphroditidae **Echinodermata** – Asteroidea, *Astropecten irregularis* **Other - Cnidaria** - *Alcyonium* sp., *Pennatula phosphorea*, **Foraminifera** – *Astrorhiza* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_106

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	78m	
Zone	Offshore Circalittoral	
Block	UKCS 42/9	
Target Location	350157 E	6075813 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Moderately Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand***** 0.0% Gravel 92.6% Sand 7.4% Mud

*** Classified as Slightly Gravelly Sand in GRADISTAT analysis due to <0.1% Very Fine Gravel**

Biology	
Fauna from seabed imagery and video	**Annelida (Polychaeta)** – Polychaete tubes **Echinodermata** - Ophiuroidea, *Astropecten irregularis, Asterias rubens* **Other - Cnidaria** - *Pennatula phosphorea*, Pennatulacea, *Alcyonium* sp., *Epizoanthus papillosus,* **Foraminifera** – *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Galathowenia oculata* (77), *Praxillella affinis* (12), *Ampharete falcata* (10), *Paramphinome jeffreysii* (9), Spiophanes *bombyx* (5), *Diplocirrus glaucus* (4), *Notomastus latericeus* (3), *Owenia fusiformis* (3) **Arthropoda (Crustacea)** - *Ampelisca tenuicornis* (2) **Mollusca** - *Chaetoderma nitidulum* (6), *Acteon tornatilis* (2), *Chamelea stritula* (2), *Phaxas pellucidus* (2) **Echinodermata** - Ophiuroidea juv. (10), *Pseudothyone raphanus* (3) **Other** - **Nemertea** (6)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.Ssa.CMuSa	Circalittoral muddy sand
EUNIS: A5.26	

STATION TCC_107

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	80m	
Zone	Offshore Circalittoral	
Block	UKCS 42/9	
Target Location	351040 E	6076074 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.1% Gravel 95.0% Sand 4.9% Mud

Biology	
Fauna from seabed imagery and video	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - *Ebalia* sp., Paguridae **Other - Teleostei** - Pleuronectiformes, **Cnidaria** - *Alcyonium* sp., *Hydractinia echinata, Pennatula phosphorea*, *Virgularia mirabilis*, **Foraminifera** – *Astrorhiza* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Galathowenia oculata* (44), *Paramphinome jeffreysii* (16), *Ampharete falcata* (7), *Ampharete lindstroemi* (2), *Chaetozone setosa* (2), *Levinsenia gracilis* (2), *Diplocirrus glaucus* (2), *Praxillella affinis* (6), **Mollusca** - *Thyasira equalis* (5) **Echinodermata** - Ophiuroidea juv. (7), *Amphiura filiformis* (2) **Other - Nemertea** (5)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CMuSa	Circalittoral muddy sand
EUNIS: A5.26	

STATION TCC_108

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	74m	
Zone	Offshore Circalittoral	
Block	UKCS 42/10	
Target Location	359464 E	6076896 N
Estimated sediment type from seabed imagery	Fine to medium sand/muddy sand	
PSA	-	

Biology	
Fauna from seabed imagery and video	**Annelida (Polychaeta)** – Polychaete tubes, *Oxydromus flexuosus* **Echinodermata** - Asteroidea **Other - Cnidaria** - *Pennatula phosphorea*, **Foraminifera** – *Astrorhiza* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CMuSa	Circalittoral muddy sand
EUNIS: A5.26	

STATION TCC_109

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	70m	
Zone	Offshore Circalittoral	
Block	UKCS 42/10	
Target Location	360467 E	6077017 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand*****
		0.0% Gravel 97.4% Sand 2.6% Mud

*** Classified as Slightly Gravelly Sand in GRADISTAT analysis due to <0.1% Very Fine Gravel**

Biology	
Fauna from seabed imagery and video	**Annelida (Polychaeta)** – Polychaete tubes **Arthropoda (Crustacea)** - Brachyura, *Ebalia* sp., Paguridae **Echinodermata** - Asteroidea **Other - Teleostei** - *Myxine glutinosa*, **Cnidaria** – Actiniaria, *Pennatula phosphorea*
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Galathowenia oculata* (74), *Myriochele danielsseni* (9), *Paramphinome jeffreysii* (8), *Diplocirrus glaucus* (7), Sp*iophanes bombyx* (6), *Ampharete lindstroemi* (3), *Trichobranchus roseus* (3), *Owenia fusiformis* (2) **Arthropoda (Crustacea)** - *Ampelisca tenicornis* (2), *Astacilla dilatata* (2) **Mollusca** - *Abra* juv. (5), *Thyasira equalis* (4), *Chamelea striatula* (2), *Cochlodesma praetenue* (2), *Lucinoma borealis* (2) **Echinodermata** - *Labidoplax buskii* (4), Echinoidea juv. (2), Ophiuroidea juv. (2), *Pseudothyone raphanus* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_110

Physical Environment		
Target Water Depth	56m	
Zone	Circalittoral	
Block	UKCS 42/5	
Target Target Location	369895 E	6079785 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Sp*irobranchus* sp., **Arthropoda (Crustacea)** - Paguridae, Brachyura **Other - Teleostei** – Pleuronectiformes, Scorpaniformes, **Cnidaria** - *Alcyonium* sp.
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_111

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	52m	
Zone	Circalittoral	
Block	UKCS 42/5	
Target Target Location	370938 E	6079985 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Poorly Sorted Wentworth: Modified Folk:	 Fine Sand Gravelly Sand 8.6% Gravel 89.1% Sand 2.3% Mud

Habitat Type	
JNCC: SS.SSa.CFiSa.ApriBatPo	*Abra prismatica*, *Bathyporeia elegans* and polychaetes in circalittoral fine sand
EUNIS: A5.252	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Sp*irobranchus* sp., **Arthropoda (Crustacea)** - Brachyura **Mollusca** – Prosobranchia **Other - Teleostei** – Pleuronectiformes, Scorpaniformes
Dominant fauna from biology data	**Annelida (Polychaeta)** - *Ophelia borealis* (20), Sp*iophanes bombyx* (18), *Lagis koreni* (5), *Scoloplos (Scoloplos) armiger* (4), *Chaetozone christiei* (3), *Goniada Maculata* (3), *Poecilochaetus serpens* (3), Sp*iophanes kroyeri* (3), *Paramphinome jeffreysii* (2), *Pholoe baltica (sensu Petersen)* (2), *Sthenelais* (2) **Arthropoda (Crustacea)** - *Bathyporeia elegans* (5), *Ampelisca brevicornis* (3), *Diastylis rugosa* (3) **Mollusca** - *Abra prismatica* (7), *Nucela nitidosa* (4), *Cochlodesma praetenue* (3), *Phaxas pellucidus* (2), *Philine* sp.(2) **Echinodermata** - *Echinocyamus pusillus* (19) Ophiuroidea juv. (17), *Amphiura filiformis* (10), Asteroidea juv. (2), Echinoidea juv. (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

STATION TCC_112

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	55m	
Zone	Circalittoral	
Block	UKCS 43/1	
Target Target Location	371841 E	6080086 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand*****
		0.0% Gravel 97.9% Sand 2.0% Mud

*** Classified as Slightly Gravelly Sand in GRADISTAT analysis due to <0.1% Very Fine Gravel**

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Other - Teleostei** - Pleuronectiformes
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (27), *Scoloplos (Scoloplos) armiger* (6), *Ampictene auricoma* (4), *Lanice conchilega* (2) **Arthropoda (Crustacea)** - *Harpinia antennaria* (2), *Ampelisca brevicornis* (4) **Mollusca** - *Abra prismatica* (8), *Nucela nitidosa* (5), *Philine* sp. (4), *Kutiella bidentata* (3), *Cylichna cylindracea* (2), *Dosinia* juv. (2), *Phaxas pellucidus* (2) **Echinodermata** - Ophiuroidea juv. (15), *Amphiura filiformis* (17), Asteroidea juv. (3), *Echinocyamus pusillus* (3) **Other - Cnidaria** - Edwardsiidae sp. (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_113

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	58m	
Zone	Circalittoral	
Block	UKCS 43/1	
Target Target Location	373065 E	6080186 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 1.0% Gravel 96.0% Sand 3.0% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polycaheta)** - Polychaete tubes **Other - Teleostei** – Rajidae
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (9), *Amphictene auricoma* (5), *Sthenelais limicola* (3), *Diplocirrus glaucus* (2), *Scoloplos (Scoloplos) armiger* (2) **Arthropoda (Crustacea)** - *Ampelisca brevicornis* (2) **Mollusca** - *Abra prismatica* (4), *Cylichna cylindracea* (3), *Lucinoma borealis* (3), *Nucela nitidosa* (3), *Thyasira flexuosa* (3), *Acteon tornatilis* (2), *Chamelea striatula* (2) **Echinodermata** - Ophiuroidea juv. (10), *Amphiura filiformis* (8), Echinoidea juv. (4) **Other - Phoronida** - *Phoronis* sp. (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_114

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	47m	
Zone	Circalittoral	
Block	UKCS 43/1	
Target Target Location	380868 E	6081109 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.4% Gravel 97.6% Sand 2.1% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Echinodermata (Asteroidea)** - *Astopecten irregularis* **Other - Teleostei** – Pleuronectiformes, **Cnidaria** - *Hydractinia echinata*
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (28), *Amphictene auricoma* (9), *Lagis koreni* (4) *Sthenelais limicola* (3), *Goniada maculata* (2), *Nephtys hombergii* (2) **Arthropoda (Crustacea)** - *Ampelisca brevicornis* (2), *Bathyporeia gracilis* (2) **Mollusca** - *Nucela nitidosa* (16), *Angulus fabula* (11), *Thracia phaseolina* (5) *Abra prismatica* (4), *Abra* juv. (2) *Cylichna cylindracea* (2), *Phaxas pellucidus* (2) **Echinodermata** - *Amphiura filiformis* (16), Asteroidea juv. (3), Ophiuroidea juv. (3) **Other - Phoronida** - *Phoronis* sp. (4)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_115

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	43m	
Zone	Circalittoral	
Block	UKCS 43/2	
Target Target Location	384679 E	6080487 N
Estimated sediment type from seabed imagery	Gravelly sand	
PSA	Very Poorly Sorted Wentworth: Modified Folk: 64.8% Gravel 34.4% Sand 0.8% Mud	Very Fine Gravel Sand Gravel

Habitat Type	
JNCC: SS.SSa.CfiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes, Sp*irobranchus* sp. **Echinodermata** - Asteroidea, Ophiuroidea, *Psammechinus* sp. **Mollusca** - Gastropoda **Other - Cnidaria** - *Alyconium* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (31), *Chatozone christiei* (30), *Amphictene auricoma* (22), *Pholoe baltica (sensu Petersen)* (10), *Lagis koreni* (8), *Glycera alba* (3), *Scoloplos (Scoloplos) armiger* (3), Goniadidae juv. (2), *Nephtys* juv. (2), *Ophelia borealis* (2), *Scalibregma inflatum* (2) **Arthropoda (Crustacea)** - *Galathea intermedia* (2) **Mollusca** - *Kurtiella bidentata* (2), *Lucinoma borealis* (2), *Phaxas pellucidus* (2), *Philine* sp. (2), *Tellimya ferruginosa* (2) **Echinodermata** - *Amphiura filiformis* (22), Ophiuroidea juv. (6), *Echinocyamus pusillus* (2) **Other** - **Nemertea** (3), **Phoronida** - *Phoronis* sp. (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Cnidaria** - *Alcyonium* sp., **Nematoda**

STATION TCC_116

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	43m	
Zone	Circalittoral	
Block	UKCS 43/2	
Target Target Location	385862 E	6080667 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 0.4% Gravel 97.3% Sand 2.4% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Other - Cnidaria** - *Hydractinia echinata*
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (40), *Scoloplos (Scoloplos) armiger* (6), *Chaetozone christiei* (3), *Lagis koreni* (3), *Magelona alleni* (3), *Magelona filiformis* (3), *Diplocirrus glaucus* (2), *Eteone longa* (2), *Pholoe baltica (sensu Petersen)* (2) **Arthropoda (Crustacea)** - *Ampelisca brevicornis* (2) **Mollusca** - *Abra prismatica* (13), *Angulus fabula* (12), *Phaxas pellucidus* (6), *Nucela nitidosa* (3), *Thracia phaseolina* (3), *Cylichna cylindracea* (2), *Thyasira flexuosa* (2) **Echinodermata** - *Amphiura filiformis* (8), Ophiuroidea juv. (7) **Other - Phoronida** - *Phoronis* sp. (6)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	**Other - Nematoda**

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_117

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	39m	
Zone	Circalittoral	
Block	UKCS 43/2	
Target Target Location	386765 E	6080848 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Mollusca** – Scaphopoda **Echinodermata** - Asteroidea **Other - Teleostei** - Pleuronectiformes, **Cnidaria** - Hydrozoa
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

STATION TCC_118

Physical Environment		
Target Water Depth	37m	
Zone	Circalittoral/Sublittoral	
Block	UKCS 43/2	
Target Target Location	388029 E	6081068 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Poorly Sorted Wentworth: Fine Sand Modified Folk: Gravelly Sand 12.7% Gravel 85.8% Sand 1.5% Mud	

Habitat Type	
JNCC: SS.SSa.CfiSa / SS.SCS.CCS	Circalittoral fine sand with patches of circalittoral coarse sediment
EUNIS: A5.25 / A5.14	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Arthropoda (Crustacea)** - Paguridae **Other - Cnidaria** – *Alcyonium* sp.
Dominant fauna from biology data	**Annelida (Polychaeta)** Sp*iophanes bombyx* (65), *Pholoe baltica (sensu Petersen)* (16), *Lagis koreni* (12), *Goniada maculata* (5), *Chaetozone christiei* (3), *Eteone longa* (3), *Magelona filiformis* (3), *Nephtys* juv (3), *Amphictene auricoma* (2), *Glycinde nordmanni* (2), Goniadidae juv, (2), *Phyllodoce rosea* (2), *Scoloplos (Scoloplos) armiger* (2), *Stenelais limicola* (2) **Arthropoda (Crustacea**) - *Ampelisca brevicornis* (3) **Mollusca** - *Angulus fabula* (4), *Abra prismatica* (3), *Phaxas pellucidus* (3), *Chamelea striatula* (2), *Dosinia* juv. (2), *Tellimya ferruginosa* (2), *Thracia* juv. (2) **Echinodermata** - *Acrocnida brachiata* (10), Ophiuroidea juv. (6), *Amphiura filiformis* (4), *Echinocyamus pusillus* (2) **Other - Nemertea** (3)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

STATION TCC_119

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	33m	
Zone	Circalittoral	
Block	UKCS 43/2	
Target Target Location	389854 E	6081229 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	-	

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - *Astropecten irregularis* **Other - Bryozoa** - *Alcyonidium diaphanum*
Dominant fauna from biology data	-
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	

STATION TCC_120

APPENDIX G – BIOTOPE CLASSIFICATION

Teesside Cable Corridor

Physical Environment		
Target Water Depth	30m	
Zone	Circalittoral	
Block	UKCS 43/2	
Target Target Location	391459 E	6081369 N
Estimated sediment type from seabed imagery	Fine to medium sand	
PSA	Very Well Sorted Wentworth: Modified Folk:	 Fine Sand Slightly Gravelly Sand 1.3% Gravel 97.3%Sand 1.4% Mud

Biology	
Fauna from seabed imagery	**Annelida (Polychaeta)** - Polychaete tubes **Echinodermata** - *Astropecten irregularis* **Other - Teleostei** - Pleuronectiformes
Dominant fauna from biology data	**Annelida (Polychaeta)** - Sp*iophanes bombyx* (27), *Lagis koreni* (4) *Magelona johnstoni* (3), *Amphictene auricoma* (2), *Chaetozone christiei* (2), *Magelona filiformis* (2), *Nephtys assimilis* (2) **Mollusca**- *Angulus fabula* (18), *Gari* juv. (2), *Phaxas pellucidus* (2)
Presence only fauna (colonial, encrusting and planktonic taxa separated as per GEL (2010))	-

Habitat Type	
JNCC: SS.SSa.CFiSa	Circalittoral fine sand
EUNIS: A5.25	