GREEN VOLT

Technical Appendix 8.1

Habitat Assessment Report

Offshore EIA Report: Volume 2

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Survey Report for
CNOOC International

Project:
Ettrick Debris Clearance and Green Volt Environmental Survey

Description:
Environmental Habitat Assessment Report

Survey Date:
Survey: 19-Aug-2021 to 25-Sept-2021
Environmental: 9-Sep-2021 to 11-Sep-2021

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CNOOC International Prospect House 97 Oxford Road Uxbridge UB8 1LU	RPS Energy Goldvale House 27-41 Church Street West Woking Surrey GU21 6DH
For attention of	For attention of
George Moise	Karen Ware, Nicholas Jones

EXECUTIVE SUMMARY

During August and September 2021, Gardline Limited conducted a debris clearance survey on behalf of CNOOC International across the United Kingdom continental shelf (UKCS) Blocks 19/10, 19/14, 19/15, 20/2, 20/3, 20/6 and 20/7. Operations included a geophysical survey, habitat assessment and environmental baseline survey, undertaken onboard the motor vessel *Kommandor* between 20-Aug-2021 to 29-Sep-2021, with all environmental survey work carried out between 20-Sep-2021 to 19-Sep-2021. This report presents the results of the habitat assessment, the results of the geophysical acquisition and EBS are reported separately.

Fifteen stations and four transects were successfully investigated with a digital stills camera system followed by sediment sampling at fourteen stations. Geophysical data interpretation was supported by seabed imagery, observations made from grab sampling and particle size analysis (PSA), which confirmed the presence of a muddy sand to sand sediment type. Seabed depths across the Green Volt Development Area (GVDA) ranged from 92.3m lowest astronomical tide (LAT) to 117.2m LAT in the centre of the GVDA. Depths along the proposed Green Volt to Buzzard ECR depth ranged between 108.0m LAT to 116.3m LAT with a bathymetric low around KP3.785, while the proposed Green Volt to 12NM Limit Export Cable Route (ECR) ranged from 78.3m LAT at KP34.810 to 118.1m LAT at KP9.402.

Sea pens were present at all stations and transects across the GVDA and proposed Green Volt to Buzzard ECR, and four of the six stations along the Green Volt to 12NM Limit ECR corridor, with a total of 2041 individuals recorded across the survey area. Faunal burrows were also observed at all stations and transects, recording a maximum density of 2.6 burrows m^{-2} at Station 11745_ENV11. According to the Marine Nature Conservation Review SACFOR scale both sea pens and burrows were classified within a range that encompassed ‘frequent’ at all stations and transects, with the exception of 11745_ENV17 and four stations along the proposed Green Volt to 12NM Limit ECR, namely 11746_ENV2, 11746_ENV3, 11746_ENV4, and 11746_ENV5. Therefore, the GVDA showed some similarity to a ‘sea pen and burrowing megafauna community’ habitat, which is listed as a threatened and/or declining habitat (OSPAR, 2010a) and the Scottish PMF (JNCC, 2012) ‘burrowed mud’ habitat.

Small aggregations of weathered *S. spinulosa* tubes were observed at Station 11746_ENV5. Biogenic reefs of *S. spinulosa* are listed under Annex I of the Habitats Directive (1992). However due to the degredated nature of the tubes observed there was no evidence of biogenic reefs within the survey area

There was no evidence of methane derived authigenic carbonates or bacterial mats associated with pockmarks and the survey area did not show any similarity to Annex I Habitats Directive (1992) ‘submarine structures made by leaking gases’ habitat.

Two observations of *Melanogrammus aeglefinus* were recorded at Transect 11745_ENV9. This species is listed as vulnerable on the IUCN Red List (2022) when considering the global assessment; however, it is listed as least concern when considering the European assessment. Five observations of *Gadus morhua* were recorded throughout the survey area, this species is listed on the Scottish Biodiversity List (2020) and as a mobile species PMF in Scottish off waters (Marine and Coastal Access Act, 2009; JNCC, 2012). Further, this species is listed as vulnerable on the IUCN Red List (2022) when considering the global assessment. However, it is listed as least concern when considering the European assessment. Two observations of *Molva molva* were recorded at Transect 11745_ENV7. This species is listed on the Scottish Biodiversity List (2020) and as a mobile species PMF in Scottish off waters (Marine and Coastal Access Act, 2009; JNCC, 2012).

Other than those habitats and species listed above, there was no further evidence from seabed imagery of any habitats listed under the Annex I of the Habitats Directive (1992), any other species or habitats selected as PMF (Marine and Coastal Access Act, 2009). Nor any species listed on the Scottish Biodiversity List (2020), species

or habitats on the OSPAR (2008) list of threatened and/or declining species nor any species on the IUCN Red List (2022).

Results of the particle size analysis presented a variable muddy sand to sand sediment type. With consideration of the results of the PSA and imagery analysis, the EUNIS (European Environment Agency, 2020), level 5 biotope A5.361 (sea pens and burrowing megafauna in circalittoral fine mud) were present across all stations and transects, with the exception of Stations 11746_ENV4 and 11746_ENV5 which were classified as level 4 EUNIS habitat type code A5.35 (circalittoral sandy mud).

SERVICE WARRANTY

USE OF THIS REPORT

This report has been prepared with due care and diligence and with the skill reasonably expected of a reputable contractor experienced in the types of work carried out under the contract and as such the findings in this report are based on an interpretation of data which is a matter of opinion on which professionals may differ and unless clearly stated is not a recommendation of any course of action.

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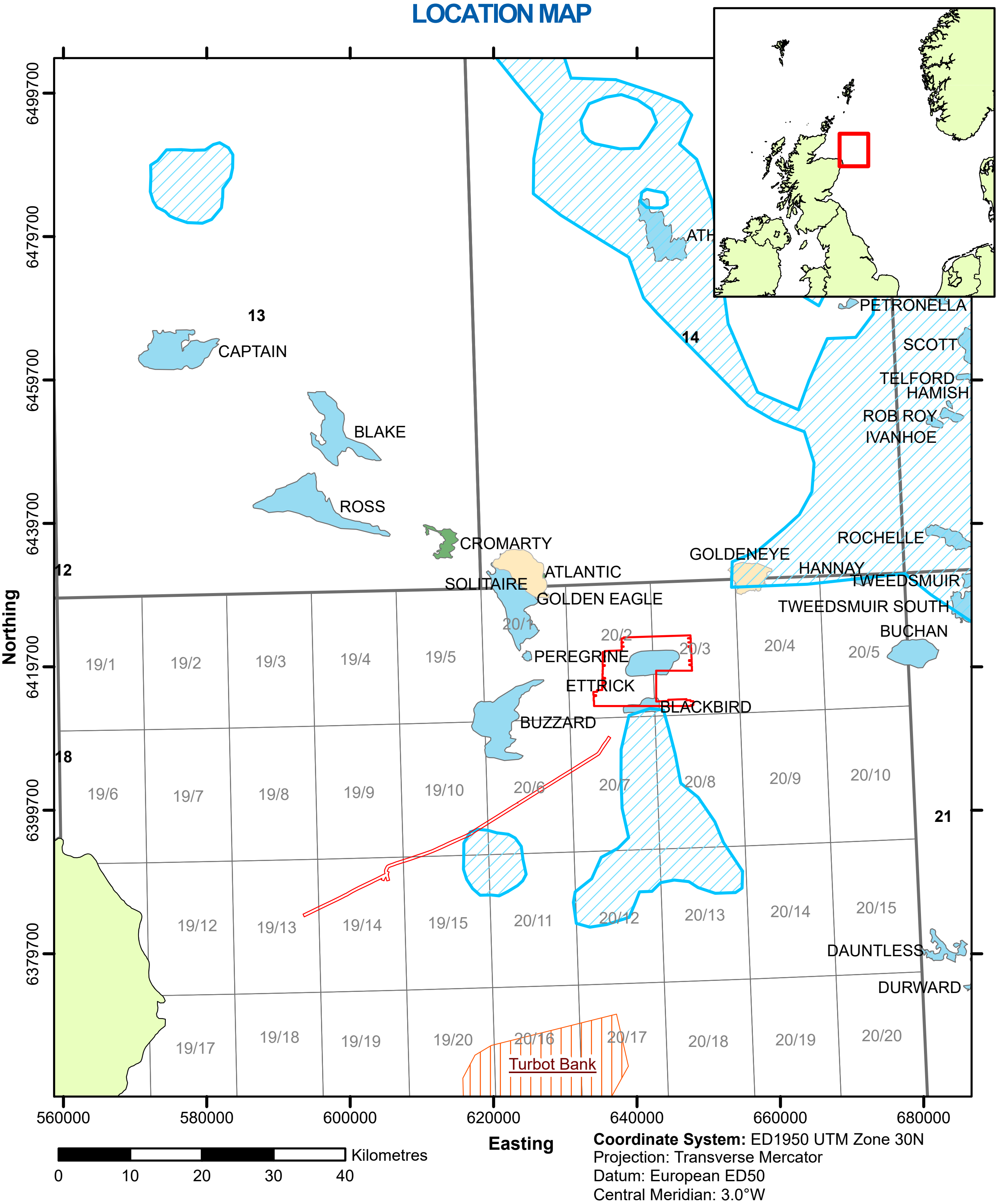
GARDLINE LIMITED
Endeavour House, Admiralty Road, Great Yarmouth, Norfolk, NR30 3NG, England
Telephone +44 (0) 1493 845600 Fax +44 (0) 1493852106
www.gardline.com

LOCATION MAP



Key

- Green Volt Survey Area
- Green Volt Export Cable Route

Offshore Marine Protected Areas (JNCC, 2020)

- Nature Conservation Marine Protected Areas (NCMPA)
- Potential Fluid Seep Areas (Graham *et al.* 2001)

Hydrocarbon Fields (UKOGA, 2021)

- Gas Field
- Oil Field
- Condensate Field

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GLOSSARY OF TERMS AND ABBREVIATIONS

Benthic	Relating to the seabed
Biogenic	Produced by living organisms
BSI	British Standards Institute
Clay	Sediment grains <3.9µm in diameter
CM	Central Meridian
EBS	Environmental Baseline Survey
EC	European Commission
ECR	Export Cable Route
EEA	European Environment Agency
EOT	End of Transect
EUNIS	European Union Nature Identification System
Fines	Sediment grains <63µm in diameter (same as Mud)
GGL	Gardline Geosurvey Limited
Gravel	Sediment grains ≥2mm in diameter
GVDA	Green Volt Development Area
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature and Conservation Committee
KP	Kilometre Point
LAT	Lowest Astronomical Tide
Macrofauna	Organisms that are normally larger than the mesh size of the sieve used. Then state the sieve size *e.g.* "In this case 0.5mm".
MBES	Multi-beam Echo Sounder
Mud	Sediment grains <63µm (includes Silt and Clay)
NCMPA	Nature Conservation Marine Protected Area
NM	Nautical Mile
NMBAQC	National Marine Biological Association Quality Control
OSPAR	Oslo and Paris convention
PMF	Priority Marine Feature
PSA	Particle Size Analysis
PWL	Proposed Well Location
SAC	Special Area of Conservation
SACFOR	JNCC (2013) density scale classification: Superabundant, abundant, common, frequent, occasional and rare
Sand	Sediment grains ≥63µm and <2mm in diameter
SD	Standard Deviation
Silt	Sediment grains ≥3.9µm and <63µm in diameter
SOT	Start of Transect
SOW	Scope of Work
SSS	Side Scan Sonar
UHRS	Ultra-High Resolution Seismic
UKBAP	United Kingdom Biodiversity Action Plan
UKCS	United Kingdom Continental Shelf
USBL	Ultra Short Base Line
UTM	Universal Transverse Mercator

1 PROJECT SUMMARY

1.1 Scope of Work

During August and September 2021, Gardline Limited conducted a debris clearance survey on behalf of CNOOC International across the United Kingdom continental shelf (UKCS) Blocks 19/10, 19/14, 19/15, 20/2, 20/3, 20/6 and 20/7. The survey comprised a geophysical survey, habitat assessment and environmental baseline survey (EBS). Survey operations were undertaken onboard the Gardline motor vessel (MV) *Kommandor* between 20-Aug-2021 to 29-Sep-2021, with all environmental survey work carried out between 20-Sep-2021 to 19-Sep-2021.

A debris clearance and environmental survey were required at the proposed Green Volt Development Area (GVDA) and Ettrick Field simultaneously, as the two areas are coincident. In addition, the associated route from Green Volt to the Buzzard Platform and the Export Cable Route from Green Volt to the 12NM limit required an environmental survey.

The coordinates of the the proposed well locations at Ettrick are presented in Table 1.1, with the start and end coordinated of the proposed routes presented in Table 1.2. All positional information in this report is referenced to International 1924 Ellipsoid, European Datum 1950. All grid coordinates are projected using Universal Transverse Mercator Projection, Grid Zone 30, Central Meridian (CM) 3º W.

Table 1.1 Coordinates of the Proposed Well Locations

Proposed Well Location Coordinates	International 1924, ED50		UTM Zone 30	
	Latitude	Longitude	Easting	Northing
Ettrick PWL1	57°54'02.285"N	00°36'31.825"W	641720	6420299
Ettrick PWL2	57°53'34.706"N	00°40'24.053"W	637927	6419313

Source: Scope of work (SOW; RPS, 2021)

Table 1.2 Coordinates of the Proposed Routes

Route	Proposed Route Point	Easting	Northing	Latitude	Longitude	Route KP
Proposed Green Volt to 12nm Limit Export Cable Route	Start	638725	6413701	57° 50' 32.514" N	000° 39' 47.428" W	0.000
	End	593862	6385261	57° 35 55.215" N	001° 25' 46.511" W	54.494
Proposed Green Volt to Buzzard Export Cable Route	Start	638725	6413701	57° 50' 32.514" N	000° 39' 47.428" W	0.000
	End	621917	6410291	57° 48' 59.951" N	000° 56' 52.125" W	17.150

Source: Debris Clearance, Route and Environmental Field Survey Report (Gardline, 2022)
KP Kilometre Point

The overall survey objectives, as defined in the scope of work (SOW: RPS, 2021), were to:

- establish and confirm the water depths and seabed conditions.
- identify any seabed obstructions within the anchor radius of the two well locations at Ettrick and confirm the location of any existing infrastructure such as pipelines, wellheads and shipwrecks.
- acquire environmental data to monitor the environmental conditions against the pre-drill baseline conditions established during the pre-drill survey of the original well, as defined by industry standards.
- Provide characterisation of the physical, chemical and biological conditions of the area.

To meet the aims of the habitat assessment the presence of the following environmentally sensitive species and habitats within the survey area were assessed:

- any potential habitats listed under Annex I of the Habitats Directive (1992), as implemented by the Conservation of Offshore Marine Habitats and Species Regulations (2017) which supersedes the Offshore Marine Conservation (Natural Habitats, &c.) Regulations (as amended) as endorsed by the Marine and Coastal Access Act (2009).
- species or habitats selected as priority marine features (PMFs) in Scottish offshore waters (Joint Nature Conservation Committee, 2012), under the Marine and Coastal Access Act (2009).
- species listed on the Scottish Biodiversity List (2020), given credence under the UK Post-2010 Biodiversity Framework (JNCC and Defra, 2012).
- species or habitats on the OSPAR (2008) list of threatened and/or declining species and habitats.
- species on the IUCN Red List of threatened species (2022)

This report presents the results of the habitat assessment. The results of the EBS and geophysical site survey are summarised where relevant in this report and are documented in full separately (Gardline, In progressa; 2022).

1.2 Environmental Survey Strategy

All station and transect names were prefixed with the Gardline reference "11745_" or "11746_" and suffixed with "_C" for camera acquisition or "_G" for grab acquisition; however, for conciseness these have been removed where possible in this report. The station and transect names have not been abbreviated in the survey logs, image file names or video overlay. For further information see Table 1.3 and Table 1.4.

Following optimisation of the SOW (RPS, 2021), fifeteen stations were selected for imagery and sediment sampling aross the GVDA, GreenVolt to Buzzard ECR and the Green Volt to 12NM Limit ECR. Stations 11745_ENV1 to 11745_ENV6 were pre-selected by the client as stations to be revisited, Stations 11745_ENV14 to 11745_ENV16 selected to investigate habitat and bathymetric changes. Three imagery only stations, 11745_ENV10 to 11745_ENV12 were selected in order to delineate potentially sensitive habitat types. In addition, four imagery only transects were selected within the GVDA. Three transects (Transects 11745_ENV7 to 11745_ENV9) were selected to traverse the abandoned anchor mooring piles, in order to assess the impact on the seabed (RPS, 2021), with the fourth (Transect 11745_ENV13) positioned to investigate a pockmark. Stations 11745_ENV14 and 11745_ENV17 were selected along the Green Volt to Buzzard ECR whilst Stations 11745_ENV18 and 11746_ENV1 to 11746_ENV5 were selected along the Green Volt to 12NM Limit ECR.

All stations and transects were successfully investigated with the Sea Spyder digital still camera system. Benthic sampling was completed at fourteen of fifteen stations using a 0.1m^2 Day grab. One sample (designated CHEM) from each station was sub-sampled for analysis of particle size, hydrocarbons, metals and organics and were frozen until analysed. The remaining samples (designated MFA, MFB and MFC) were sieved through a 0.5mm mesh sieve to provide benthic faunal samples, which were preserved in buffered formalin. Two of the faunal samples (MFA and MFB), were worked up in the laboratory, with the third sample (MFC), retained at Gardline's premises as a spare.

Details of the station and transect locations are summarised in Table 1.3 and Table 1.4. Target and actual sampling locations, the latter of which may be slightly offset from the former, are presented in Figure 1.1 and the Surveyor's log sheets in Appendix A.

Table 1.3 Summary of Transects

	Client Assigned Transect Name	Transect as Referred to in the SOW	Transect as Referred to in this Report	Designation[1]	Target	SOT Easting	SOT Northing	EOT Easting	EOT Nothing	Length (m)
GVDA	11745_TR_ENV7_C	Transect1	11745_ENV7	1.4km ESE	Predetermined	643078	6419980	643222	6420021	182
	11745_TR_ENV8_C	Transect2	11745_ENV8	14.4km NNW	Predetermined	641367	6421694	641405	6421838	173
	11745_TR_ENV9_C	Transect3	11745_ENV9	2.9km NE	Predetermined	643742	6422464	643850	6422359	177
	11745_TR_ENV13_C		11745_ENV13	2.1km ESE	Pockmark feature	643549	6419197	643647	6419199	120

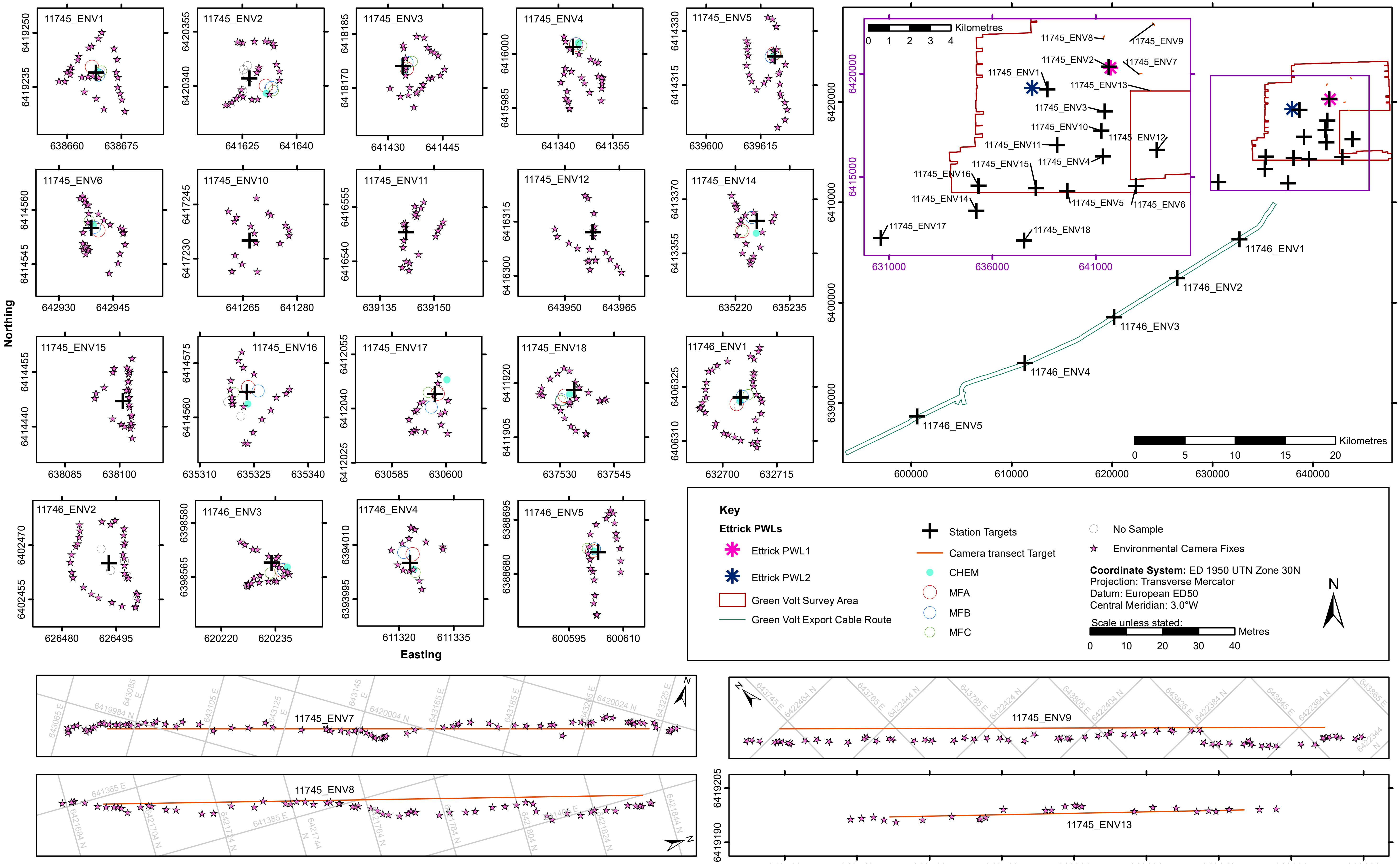
SOT Start of transect
EOT End of transect
1 Station designation is the distance and direction from the SOT to Ettrick PWL1

Table 1.4 Summary of Environmental Stations

	Client Assigned Camera Station Name	Client Assigned Grab Sampling Station Name	Station as Referred to in the SOW	Station as Referred to in this Report	Designation[1]	GreenVolt to 12NM Limit KP[2]	GreenVolt to Buzzard ECR KP[2]	Target	Easting[3]	Northing[3]	Camera	Grab Samples Acquired[4]			
												MFA	MFB	MFC	CHEM
GVDA	11745_ENV1_C	11745_ENV1_G	GV_GS05	11745_ENV1	3.2km WSW		5.5km N of KP0	Pre-determined	638668	6419239	Y	1	1	1	1
	11745_ENV2_C	11745_ENV2_G	GV_GS06	11745_ENV2	0.1km WNW		7.2km NNE of KP0	Pre-determined	641627	6420342	Y	1	1	1	1
	11745_ENV3_C	11745_ENV3_G	GV_GS09	11745_ENV3	2.1km S		5.2km NNE of KP0	Pre-determined	641434	6418176	Y	1	1	1	1
	11745_ENV4_C	11745_ENV4_G	GV_GS14	11745_ENV4	4.3km S		3.5km NE of KP0	Pre-determined	641344	6416002	Y	1	1	1	1
	11745_ENV5_C	11745_ENV5_G	GV_GS18	11745_ENV5	6.3km SSW		1.1km NE of KP0	Pre-determined	639619	6414323	Y	1	1	1	1
	11745_ENV6_C	11745_ENV6_G	GV_GS19	11745_ENV6	5.9km SSE		4.2km ENE of KP0	Pre-determined	642939	6414555	Y	1	1	1	1
	11745_ENV10_C	11745_ENV10_G		11745_ENV10	3.1km S		4.3km NE of KP0	Delineate habitat	641267	6417235	Y				
	11745_ENV11_C	11745_ENV11_G		11745_ENV11	4.6km SW		2.8km S of KP0	Delineate habitat	639142	6416548	Y				
	11745_ENV12_C	11745_ENV12_G		11745_ENV12	4.6km SSE		5.8km ENE of KP0	Delineate habitat	643958	6416312	Y				
	11745_ENV15_C	11745_ENV15_G		11745_ENV15	6.9km SSW	2.4km NNE of KP2	984m NNE of KP1	Potential habitat change	638101	6414447	Y				
	11745_ENV16_C	11745_ENV16_G		11745_ENV16	8.6km SW	3.4km NW of KP2	1.5km NNW of KP3	Bathymetric change in the SW corner of Green Volt	635323	6414567	Y	1	1	1	1
Green Volt to Buzzard ECR	11745_ENV14_C	11745_ENV14_G		11745_ENV14	9.5km SW	2.7km WNW of KP2	586m NE of KP4	Bathymetric change in the SW corner of Green Volt	635226	6413364	Y	1	1	1	1
	11745_ENV17_C	11745_ENV17_G		11745_ENV17	13.9km SW		288m WSW of KP8	Green Volt to Buzzard Platform ECR	630597	6412044	Y	1	1	1	1
Green Volt to 12NM Limit ECR	11745_ENV18_C	11745_ENV18_G		11745_ENV18	9.4km SSW	152m SSW of KP2	1.6km NNW of KP3	Green Volt to 12NM Limit ECR	637534	6411918	Y	1	1	1	1
	11746_ENV1_C	11746_ENV1_G		11746_ENV1	16.6km SSW	345m ENE of KP10		Bathymetric low, low reflectivity seabed	632705	6406322	Y	1	1	1	1
	11746_ENV2_C	11746_ENV2_G		11746_ENV2	23.5km SW	50m ESE of KP17		Low reflectivity seabed	626493	6402465	Y				
	11746_ENV3_C	11746_ENV3_G		11746_ENV3	30.6km SW	349m SW of KP24		High reflectivity seabed with sand waves	620234	6398569	Y	1	1	1	1
	11746_ENV4_C	11746_ENV4_G		11746_ENV4	40.2km SW	376m WSW of KP34		Bathymetric high, high reflectivity seabed between sand waves	611323	6394005	Y	1	1	1	1
	11746_ENV5_C	11746_ENV5_G		11746_ENV5	43.8km WSW	126m NNE of KP47		Sand waves boundary, elevated outcropping.	600603	6388686	Y	1	1	1	1

1 Station designation is the distance and direction from the Ettrick PWL1
2 KP refers to kilometre points along the surveyed route.
3 Environmental target locations; actual sampling positions for each individual grab sample are detailed in Appendix A
4 Three macrofaunal samples (MFA, MFB and MFC) sieved through a 0.5mm mesh and one physico-chemistry sample (CHEM)

Figure 1.1 Target and Actual Sampling Locations



1.3 Background Habitat Information

1.3.1 Overview

This section presents an overview of the habitats and faunal communities expected to occur within UK waters in the vicinity of the GVDA survey.

1.3.2 Sea Pen and Burrowing Megafauna Communities

A 'sea pen and burrowing megafauna communities' habitat is classified as a threatened and/or declining habitat (OSPAR, 2008). It is defined by OSPAR (2010a) as plains of fine mud, extending over an area of at least 25m^2 and at water depths ranging from 15m to 200m or more. These areas are defined as being heavily bioturbated by burrowing megafauna including *Nephrops norvegicus*, *Calocaris macandreae* or *Callianassa subterranea*, with burrows and mounds typically forming a prominent feature of the sediment surface, and which may include conspicuous populations of sea pens (Pennatulacea); typically, *Virgularia mirabilis* and *Pennatula phosphorea*. Despite its classification as a threatened and/or declining habitat (OSPAR, 2008); this habitat is widespread throughout the central North Sea, around the south and west coasts of Norway and around the north of the British Isles (OSPAR, 2010a).

1.3.3 Biogenic Reefs - *Sabellaria spinulosa*

Biogenic reefs formed by the tube-dwelling *Sabellaria spinulosa* (Graham *et al.*, 2001), are listed under Annex I of the Habitats Directive (1992). Areas of *S. spinulosa* reefs consist of thousands of fragile sand-tubes. In favourable conditions *S. spinulosa* tubes form dense aggregations which consolidate to create solid structures rising above the surrounding seabed. Individual clumps of *S. spinulosa* tubes can regularly form and disintegrate; however, overall reef structures can persist for several years (OSPAR, 2013). The structural complexity provided by *S. spinulosa* reefs often enables the development of a faunal community of numerous small epifauna species typically comprising calcareous tubeworms, pycnogonids, hermit crabs, amphipods, hydroids, bryozoans, sponges and ascidians (Connor *et al.*, 2004).

1.3.4 Submarine Structures Made by Leaking Gas

The European Commission (EC) Habitats Directive includes 'submarine structures made by leaking gases' as a protected habitat or feature on Annex I of the Directive (1992). These structures, often observed as MDAC structures within pockmarks, have been well documented in the North Sea; with sediments and biological communities studied in some detail (Hovland & Judd, 1988).

Under European guidance from Natura 2000 (Johnston *et al.*, 2002), only those pockmarks containing 'spectacular submarine complex structures' are to be potentially designated as Special Areas of Conservation (SAC). These are defined as 'spectacular submarine complex structures, consisting of rocks, pavements and pillars up to 4m high' formed from the aggregation of sediment by carbonate cement, resulting from microbial oxidation of gas emissions (European Commission, 2013). Submarine structures made by leaking gases are also listed as PMF in Scottish waters (JNCC, 2012) under the Marine and Coastal Access Act (2009).

Pockmarks occur widely in certain areas of the northern and central North Sea where the seabed comprises soft muddy sediment. A typical North Sea pockmark is relatively wide and shallow; as a result of this combination there may not be any difference between fauna in the pockmark and that found on the surrounding seabed. However, in some deeper pockmarks, the reduced bottom current velocity and reduced disturbance can be sufficient to change the composition of the benthos.

In general, some pockmarks have been found to contain carbonate-cemented blocks or veneers of sediment known as MDAC, upon and around which biological communities are found to be highly diverse. The fauna of pockmarks can be especially abundant in bivalves, shrimps, bryozoans, starfish, hydroids, sea anemones and sea pens (Hovland & Thomsen, 1989). Fish may also accumulate in these areas and be attracted by the abundance of food and shelter. The bivalves *Thyasira sarsi* and *Lucinoma borealis* are species which obtain most of their nutrition from endosymbiotic sulphur-oxidising bacteria and are therefore confined to the sulphur-rich sediments of active pockmarks (Dando & Southward, 1986; Dando *et al.*, 1991).

2 DATA ACQUISITION AND PROCESSING

2.1 Seabed Imagery Acquisition

Environmental seabed images were taken by means of a digital stills camera system with a dedicated strobe and video lamp(s), mounted within a stainless steel frame. Video footage was also acquired throughout transects and target investigations using a high definition (HD) video camera. An ultra-short base line (USBL) positioning beacon was attached to the camera frame to represent the position of the system.

Footage was viewed in real time via an umbilical, assisting in the control of the digital stills camera. This allowed for shot selection to capture sediment changes or features at the seafloor.

During acquisition, a minimum of 16 seabed photographs and 10 minutes of footage were collected at each station and transect at appropriate intervals. This technique allowed the frame to move progressively along the seabed as the vessel traversed the work area on its thrusters or drifted. 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 PC hard drive. On completion, photographs were downloaded onto a PC via a USB download cable and copied onto HDD. All HDDs were labelled with the relevant job details, write-protected and stored.

During acquisition, a total of 691 photos were taken using the stills camera system across 19 stations and 4 transects with 645 minutes of footage captured. Environmental deck and positioning logs are contained in Appendix A while a selection of seabed photographs is presented in Appendix B. Main instrumental and acquisition details are presented in Table 2.1:

Table 2.1 Camera Equipment Specifications

Equipment	HD Camera System	Stills Camera System
Manufacturer	Subsea Technology & Rentals	Subsea Technology & Rentals
Model	STR Sea Spectrum IP Video Camera	STR SeaSpyder Telemetry Digital Stills Camera
Lens	Fixed focus, 1080P 25/30 fps, 720p 25/30 fps	f 3.5 – 22, 30 – 1/4000 sec shutter speed, and automatic or manual focus control
Pixels	NA	18.0 M
Video Resolution	720 – 1080p	NA
Image Resolution (pixels)	2592 x 1920	720 x 480 to 5184 x 3456
Field of View	1080p 70° air/52 ° water, 720p 85° air/64° water	53° in water
Video Overlay	STR Video Overlay software	
Trigger	Remote from deck	
Height Control	USBL Beacon and Video footage	
Lighting	4 fixed LED lamps	
Scale bar	Green point lasers with 218mm separation between laser points.	
Housing	Neutral hard anodised aluminium	

Table unit definitions: M = megapixels, p = progressive scan

2.2 Benthic Sampling

Benthic samples were recovered using an in-house constructed, modified, stainless-steel 0.1m^2 Day grab. The Day grab carried extra weights where appropriate 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. The vessel offset of grab deployment was used to represent the position of the sampler.

Grab sampling operational procedures were as follows:

The vessel's sampling area was pre-cleaned using a powerful deck fire-hose and seawater. The Day grab was thoroughly washed down using pentane prior to deployment at every station to prevent hydrocarbon cross contamination. A 1000m-length of 10mm, dry-core, galvanised-steel cable was used to lower the Day grab to the seabed.

All containers were thoroughly washed with appropriate solvents and labelled externally prior to use. Biology samples were placed in 1-litre polypropylene, screw-top, squat jars and provided with an additional internal waterproof label. Hydrocarbon samples were placed in 120ml, amber glass jars, whilst the remaining samples (metals and particle size) were placed in double-lined zip-lock bags.

Where required in deeper waters, the grab may be winched down to approximately 10-15 metres from the seabed prior to release to sea floor. Communication between the deck, bridge crew and the surveyors was conducted by means of VHF radio. When directly over the sampling station the grab was winched to the seabed and recovered so that the sample could be obtained and the apparatus prepared for the next deployment.

Positional fixes were taken for each grab sample immediately following the grab reaching 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 criteria. In the following cases, a sample would be rejected and the instrument prepared for the next deployment:

1. Jammed sample closure due to entrapment of a large stone, shell or other objects allowing surface sediment washout.
2. Accidental premature opening of sampler on recovery, causing possible surface washout.
3. Half sample obtained where the grab has not struck a flat area of bottom, or not hit true, causing a side or half bite of sediment.
4. 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).
5. The sample represents less than 40% of the grab's total capacity (*i.e.* less than 6 litres) or totally fills the grab.
6. Sample is an unacceptable distance from the target.
7. The presence of exopolymeric substances, mucus coagulants and/or fauna that generate them *i.e.,* Myxinidae.

Grab samples deemed acceptable were photographed and described prior to sub-sampling.

Surficial (<2cm depth) sediments were taken directly from the Day grab for physico-chemical analysis. Two sediment samples, one for hydrocarbon determination (HC) the other to act as a spare, were scooped using a stainless-steel spoon into 120ml amber glass jars (provided sterilised by SOCOTEC). Three further sub-samples of approximately 500g comprising one each for metals determination (M), particle size analysis (PSA) and a spare were taken using a plastic scoop and placed into plastic zip-lock bags. All physico-chemical samples were stored at less than -18°C prior to analysis.

Three separate grab samples from each station were collected for infaunal macrofaunal identification. For each faunal sample the entire contents of a single grab were washed into a clean plastic tray using seawater and then transferred to a 0.5mm mesh sieve. Finer sediment fractions were washed from the sample using an auto-sieve, which sprayed a low-powered seawater jet onto the underside of the sieve. The sieve residue was transferred to uniquely labelled sample jars using a scoop and/or funnel, making sure that none of the sample was lost or trapped in the sieve mesh. Sieved samples were immediately fixed with a known concentration of formaldehyde solution ('formalin', less than 20%). The formalin in the sample pots was subsequently diluted to a concentration of approximately 4%. Two of the faunal samples (normally those identified as MFA and MFB) were worked up as a matter of course and a third retained as a spare (normally sample MFC).

Across the fourteen sampling stations, 56 single grab samples were retained for 72 deployments, with all retained samples taken within 8m of their target location. On average, retained samples were acquired 3m (±2 SD) from their target location. Environmental deck and positioning logs are presented in Appendix A.

2.3 Imagery Processing

Seabed photos were assessed using the Gardline developed imagery analysis program (CountEM). The program allows for individual fauna to be tagged and a sediment description to be assigned to each image. The software allows features to be selected within an image to provide an accurate figure of percentage coverage of each individual element (*e.g.* cobbles and boulders, sponge) based upon the proportion of pixels. CountEM can also measure the area of seabed and observed features primarily in pixels, though this can be converted to millimetres (mm) given a reference scale within the image, such as using two laser lines with a known separation. Further, laser scale dots were used to calculate an approximate area for each photo using methodologies developed from Wakefield and Genin (1987).

Each visible morphotype was tagged once in each photograph to record it presence. The exceptions were specific features or taxa of potential interest as described in Section 1.1, which were enumerated from all images to allow assessment for the presence of protected species and/or habitats.

Video footage was reviewed and video frames were captured whenever any new taxa were observed and any further observations of specific features or taxa of potential interest. This resulted in an additional 875 video frames, which were analysed in CountEM. Other than enumerating any specific features or taxa of potential interest in the video frames and tagging as present any previously unobserved morphotypes, no further tagging was conducted.

Following quality control, data were exported into an excel file used to summarise seabed imagery observations and allow for further analysis as applicable. A reference collection of taxa ID is retained and available for the project on completion of the 11745-6.E01 Ettrick Debris Clearance and Green

Volt Environmental Surveys (Gardline, In progressb), while a summary of all taxa identified from each station is presented in Appendix C.

2.4 Habitat Analysis

2.4.1 Sea Pen and Burrowing Megafauna Communities

Clarifications on the identification of OSPAR description of the habitat were summarised in a report by the JNCC (2014) to improve the definition and correct identification of this habitat. These clarifications suggest that burrowed areas of mud should be deemed to be a 'sea pen and burrowing megafauna communities' habitat regardless of the presence of sea pens, if multiple sightings of burrows and/or mounds attributable to the relevant species are observed. Furthermore, although the habitat occurs predominantly in fine mud sediments, examples of the habitat have been identified in areas of sandy muds where there is clear evidence of the relevant biological assemblages (burrowing megafauna and in some examples, sea pens). Consequently, habitats can be classed as 'sea pen and burrowing megafauna communities' regardless of the grain size composition of the sediment (JNCC, 2014). The report (JNCC, 2014) also recommends that the definition should extend further than the habitat classification biotope 'sea-pens and burrowing megafauna in circalittoral fine mud' (Connor *et al.*, 2004) since additional biotopes are also considered to be associated with the habitat.

The clarifications (JNCC, 2014) advocate utilising seabed video imagery and/or photographs to confirm the presence of burrows and/or mounds and sea pens, where present. Whilst from seabed grab samples, identification would confirm associated fauna and particle size analysis (PSA) data a fine mud/sandy mud habitat. The density classifications as laid out by the Marine Nature Conservation Review (MNCR) SACFOR scale (JNCC, 2013) were used to quantify these defining features (see Table 2.2). The JNCC (2014) clarification report specifies that multiple sightings of burrows and/or mounds attributable to relevant species together with sea pens, if present, should be classified as at least 'frequent' for their size on the SACFOR scale in order to be considered a 'sea pen and burrowing megafauna communities' habitat. However, it acknowledges the inherent difficulties of identifying species from burrow type alone using ever evolving guides, such as those cited by the ICES (2011) guide. Subsequently, the overall density of burrows themselves were assessed instead, in order to consider whether their density was a 'prominent' feature of the sediment surface and potentially indicative of a sub-surface complex gallery burrow system.

Table 2.2 SACFOR Abundance Scale

Density	Size of Individuals			
	<1cm	1-3cm	3-15cm	>15cm
≥10000 m^{-2}	S	S	S	S
≥1000 m^{-2} to <10000 m^{-2}	A	S	S	S
≥100 m^{-2} to <1000 m^{-2}	C	A	S	S
≥10 m^{-2} to <100 m^{-2}	F	C	A	S
≥1 m^{-2} to <10 m^{-2}	O	F	C	A
≥0.1 m^{-2} to <1 m^{-2}	R	O	F	C
≥0.01 m^{-2} to <0.1 m^{-2}	R	R	O	F
≥0.001 m^{-2} to <0.01 m^{-2}	R	R	R	O
<0.001 m^{-2}	R	R	R	R

S= Superabundant, A = Abundant, C = Common, F = Frequent, O = Occasional and R = Rare. Table amended from: JNCC (2013).
For sedentary species attached to the substratum, percentage cover should be used in preference to the density scale whenever possible.

2.4.2 Biogenic Reefs - Sabellaria spinulosa

The distinction between what is or is not a *Sabellaria* sp. 'reef' is imprecise. To try to make the process of 'reef definition' more transparent and reproducible, Hendrick and Foster-Smith (2006) produced a scoring system based on a series of physical, biological and temporal characteristics of reef features:

- physical characteristics: elevation, sediment consolidation, spatial extent, patchiness
- biological characteristics: *S. spinulosa* density, biodiversity, biotope and community structure
- temporal characteristics: longevity and stability

Upon acquisition of seabed imagery, and should *S. spinulosa* be identified, the Hendrick and Foster-Smith (2006) scoring system was applied in an attempt to define the 'reefiness' of the areas or colonies identified within the surveyed area. The scoring criteria used are:

- spatial Extent – Area (from the geophysical data) of interpreted extent of colonies
- patchiness – Percentage cover (from video/stills footage)
- elevation – Average height of tubes within colony(ies) (from video/stills footage) as well as elevation of overall reef-like features relative to surrounding seabed (from MBES data)

Other scoring criteria; *e.g*. consolidation, biodiversity and longevity scores, may not be applicable as they are reliant upon time series of data, sampling observations and detailed benthic community data being available. Whilst mainly subjective, the results can allow a basic understanding of the *Sabellaria* sp. colony composition of each area to be made and a measure of its 'reefiness' to be arrived at.

The 'reefiness' scale has been based largely on results of an inter-agency workshop run by JNCC to help define and manage *S. spinulosa* reefs and reported in Gubbay (2007). During the workshop participants were asked, based on their experience, to indicate what they believed would be suitable cut off points for grading an area on a scale of low-medium-high for 'reefiness'. The best, but not unanimous, agreement which could be reached on the day is given in Table 2.3. It should be emphasized that the figures presented are considered as a starting point for wider discussion rather than accepted and fully agreed thresholds for *S. spinulosa* reef identification.

Table 2.3 Range of figures which could be used together as a measure of 'reefiness'

Measure of 'reefiness'	Not a Reef	Low	Medium	High
Elevation (cm) (average tube height)	<2	2-5	5-10	>10
Area (m^2)	<25	25-10,000	10,000-1,000,000	>1,000,000
Patchiness (% cover)	<10%	10-20%	20-30%	>30%

2.4.3 Submarine Structures Made by Leaking Gas

In contrast to other habitats of potential interest, there are no formal criteria for assessing submarine structures made by leaking gases. Therefore, if observations were detailed, with specific regards given to the notable features mention in Section 1.3.4, such as hard substrates

2.4.4 EUNIS Habitat Classification

Habitat classification is used to identify different habitats and biotopes based on the biotic and abiotic features of the seabed. Habitat and biotope classifications were conducted on the available survey data, adhering to protocols within the European Union Nature Identification System (EUNIS). The system was developed between 1996 and 2001 by the European Environment Agency (EEA) in collaboration with European experts. Table 2.4 gives examples of the five EUNIS levels used to describe the marine environments.

Table 2.4 Example EUNIS Habitat Classification Levels

Level	Detail Covered (EUNIS code)
1. Environment	Marine (A)
2. Broad habitats	Sublittoral Sediment (A5)
3. Main habitats	Sublittoral biogenic reefs on sediment (A5.6)
4. Biotope complexes	Polychaete worm reefs (A5.61)
5. Biotopes	*Sabellaria spinulosa* on stable circalittoral mixed sediment (A5.611)

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) area. 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 dependent 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 in their species communities.

2.5 Particle Size Analysis

Particle size analysis (PSA) was carried out by Thomson Environmental Consultants in accordance with NMBAQC methods for diamictons (Mason, 2016).

No dispersants were used and the sediment was not treated to remove carbonates or organic matter prior to analysis. The range of sieve sizes, together with their Wentworth classifications (Wentworth, 1922), is given in Table 2.5.

The results, given in Appendix D, 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 & Ward, 1957). These indices are described below:

1 Graphic Mean - a measure of average particle size in phi units (-log2(diamm), Folk & Ward, 1957).

$$M_z = \frac{\emptyset 16 + \emptyset 84 + \emptyset 50}{3}$$

where M_z= The graphic mean particle size in phi
ø = the phi size of the nth 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 2.6.

$$\sigma_1 = \frac{\emptyset 84 - \emptyset 16}{4} + \frac{\emptyset 95 - \emptyset 5}{6.6}$$

where σ_1 = the inclusive graphic standard deviation

3 Inclusive Graphic Skewness – the degree of asymmetry of a frequency or cumulative curve, Skewness classification are presented in Table 2.7.

$$S = \frac{\emptyset 16 + \emptyset 84 - 2(\emptyset 50)}{2(\emptyset 84 - \emptyset 16)} + \frac{\emptyset 5 + \emptyset 95 - 2(\emptyset 50)}{2(\emptyset 95 - \emptyset 5)}$$

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 2.8.

$$K = \frac{\emptyset 95 - \emptyset 5}{2.44(\emptyset 75 - \emptyset 25)}$$

where K= Kurtosis

The sediment samples were additionally classified using the modified Folk triangle classification and the EUNIS classification (Figure 2.1), with results presented in Appendix D. These classifications use the sand:mud ratio and the percentage of gravel (Folk, 1954; Parry, 2019).

Table 2.5 Phi and Sieve Aperture with Wentworth Classifications

Aperture in microns	Aperture in Phi Unit	Sediment Description	
≥16000	≤-4	Pebble	GRAVEL
<16000 to 11200	>-4 to -3.5		
<11200 to 8000	>-3.5 to -3		
<8000 to 5600	>-3 to -2.5		
<5600 to 4000	>-2.5 to -2		
<4000 to 2800	>-2 to -1.5	Granule	
<2800 to 2000	>-1.5 to -1		
<2000 to 1400	>-1 to -0.5	Very Coarse Sand	SAND
<1400 to 1000	>-0.5 to 0		
<1000 to 710	>0 to 0.5	Coarse Sand	
<710 to 500	>0.5 to 1		
<500 to 355	>1 to 1.5	Medium Sand	
<355 to 250	>1.5 to 2		
<250 to 180	>2 to 2.5	Fine Sand	
<180 to 125	>2.5 to 3		
<125 to 90	>3 to 3.5	Very Fine Sand	
<90 to 63	>3.5 to 4		
<63 to 44	>4 to 4.5	Coarse Silt	FINES
<44 to 31.5	>4.5 to 5		
<31.5 to 22	>5 to 5.5	Medium Silt	
<22 to 15.6	>5.5 to 6		
<15.6 to 11	>6 to 6.5	Fine Silt	
<11 to 7.8	>6.5 to 7		
<7.8 to 5.5	>7 to 7.5	Very Fine Silt	
<5.5 to 3.9	>7.5 to 8		
<3.9 to 2.8	>8 to 8.5	Clay	
<2.8 to 2	>8.5 to 9		
<2 to 1.4	>9 to 9.5		
<1.4 to 1	>9.5 to 10		
<1	>10		

Table 2.6 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

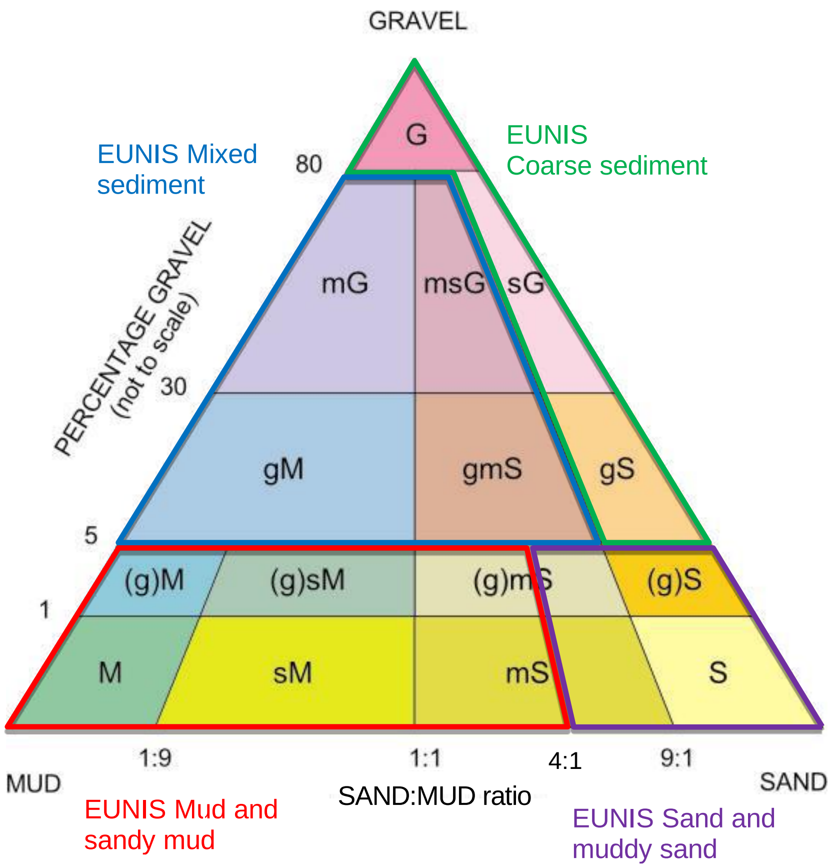
Table 2.7 Skewness Classification

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 2.8 Kurtosis Classification

Kurtosis Coefficient	Kurtosis Classification	Graphical meaning
≤ 0.67	Very Platykurtic	Flat-peaked; the ends are better sorted than the centre
0.67 < 0.90	Platykurtic	
0.90 < 1.11	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	

Figure 2.1 Modified Folk Classification and EUNIS Sediment Classes



Code	Modified Folk Classification
G	Gravel
mG	Muddy gravel
msG	Muddy sandy gravel
sG	Sandy gravel
gM	Gravelly mud
gmS	Gravelly muddy sand
gS	Gravelly sand
(g)M	Slightly gravelly mud
(g)sM	Slightly gravelly sandy mud
(g)mS	Slightly gravelly muddy sand
(g)S	Slightly gravelly sand
M	Mud
sM	Sandy mud
mS	Muddy sand
S	Sand

Source; Folk (1954) and Parry (2019)

3 RESULTS AND DISCUSSION

3.1 Geophysical Survey Overview

Equipment used during the geophysical survey included multi-beam echo sounder (MBES), single-beam echo sounder (SBES), side scan sonar (SSS), magnetometer, pinger and associated high resolution seismic (HRS), two dimensional high resolution seismic (2DHR) and ultra-high resolution seismic (UHRS). A summary of the data has been presented below, with full details provided in the geophysical reports (Gardline, 2022). Marine mammal observers and passive acoustic monitoring were utilised during the acquisition of geophysical data to ensure the campaign was run in accordance with the conditions outlined in Consent GS/1265/1 (Version 1) and GS/1265/2 (Version 1). Full information can be found within the MMO report (Gardline, 2021).

The geophysical site survey covered an area nominally measuring 11km x 13km, encompassing the Ettrick survey area within the greater GVDA. Primary survey lines were orientated 090°/270° with secondary survey lines orientated 000°/180°.

Two potential export routes were investigated, the proposed Green Volt to 12NM Limit ECR, approximately 54.5km in length and the proposed Green Volt to Buzzard ECR measuring 17.5km in length.

3.2 Bathymetry Overview

A colour shaded relief of the bathymetry data across the survey area, gridded at 2m, with insets of the video transects over the abandoned mooring piles and the pockmark, is presented in Figure 3.1, with the Green Volt to 12NM Limit ECR presented in Figure 3.2.

The water depth across the Ettrick survey area ranged from 98.5m lowest astronomical tide (LAT) on a bathymetric shoal in the northwest to 114.1m LAT in the west. Within the GVDA the water depth ranged from 92.3m LAT on a bathymetric shoal in the northwest to 117.2m LAT at the centre of the survey area. Seabed gradients across both survey areas were typically <1°, though gradients up to 2° on the flank of the north west shoal and up to 8° were present on the flanks of pockmarks.

Pockmarks and depressions were present throughout the site with pockmarks measuring up to 130m in diameter and with depths of up to 5m. The depressions measured up to 200m in length and up to 3m in depth.

Bathymetry data revealed the surface expression of buried ploughmarks throughout much of the site, with the exception of the bathymetric shoal in the northwest. The ploughmarks measure up to 150m in width and 0.5m in depth. Gradients along the flanks were <1°.

Along the proposed Green Volt to Buzzard ECR, the seabed was relatively flat with water depths ranging between 108.0m LAT to 116.3m LAT within a bathymetric low around KP3.785. Around KP4, the seabed shoaled by approximately 8m with gradients up to 2°, after which the route is relatively flat. From KP7.310 there were intermittent sand ripples with local gradients on the flanks up to 10°.

Along the proposed Green Volt to 12NM Limit ECR, the water depth ranged from 78.3m LAT at KP34.810 to 118.1m LAT at KP9.402. From the start of the route at KP0 the seabed was relatively flat until approximately KP16. The seabed began to shoal to megaripples and occasional sandwaves. At approximately KP42 sandwaves fade and megaripples become less abundant. The seabed also became more variable with bathymetric lows dominated by sand, and bathymetric highs consisting of coarser sediment. Seabed gradients were observed to be between 1-4° on the flanks of the minor shoals between KP42 and the boundary of the Southern Trench MPA (RPS, 2021) which lies approximately on the 12NM limit.

3.3 Seabed Features Summary

A SSS mosaic and interpreted seabed features are presented in Figure 3.3 and Figure 3.4 . Seabed sediments across the GVDA comprised a Holocene veneer (<0.5m) of silty sand with shell fragments, overlying Witch Ground, Swatchway and Coal Pit Formations.

Other than the pockmarks discussed in Section 3.2, abundant scars on the seabed were observed throughout the greater survey area. These were interpreted to be the result of anchoring, often associated with pull out pits, as presented in Figure 3.3.

Along the Green Volt to 12NM Limit ECR corridor seabed sediments comprised silty sand with shell fragments. Silty sands were accumulated within the bathymetric lows associated with the megaripples between KP 19.410 to KP42.400, with possible gravelly sands from KP42.400 to the end of the route along the bathymetric ridges.

Seabed sediments within the Green Volt to Buzzard ECR corridor comprised predominantly silty sand with shell fragments. Megaripples were intermittent along the route from KP7.310 to the end of the route. Occasional areas of increased sidescan sonar reflectivity may represent local accumulations of coarser material or exposures of underlying clay. Anchoring scars and pullout pits were located at KP15.962 and KP16.838, interpreted to have an approximate depth of 0.5m.

Several items of debris and a shipwreck were interpreted across the greater survey area, with occasional sidescan contacts interpreted along both route corriders, these are reported separately: (Gardline, 2022).

Figure 3.1 Colour Shaded Relief of Bathymetry – GVDA and Green Volt to Buzzard ECR

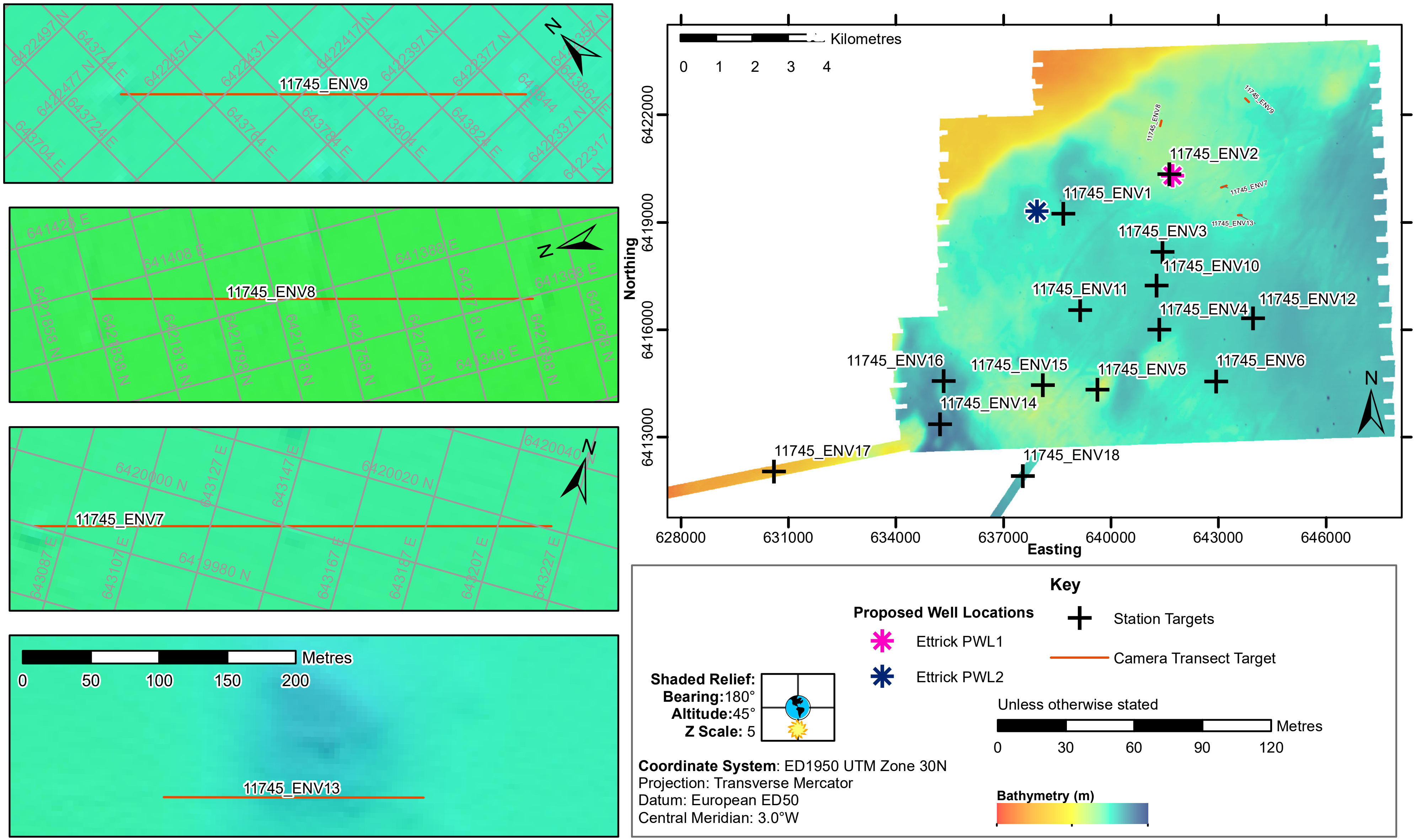


Figure 3.2 Colour Shaded Relief of Bathymetry –Green Volt to 12NM Limit ECR

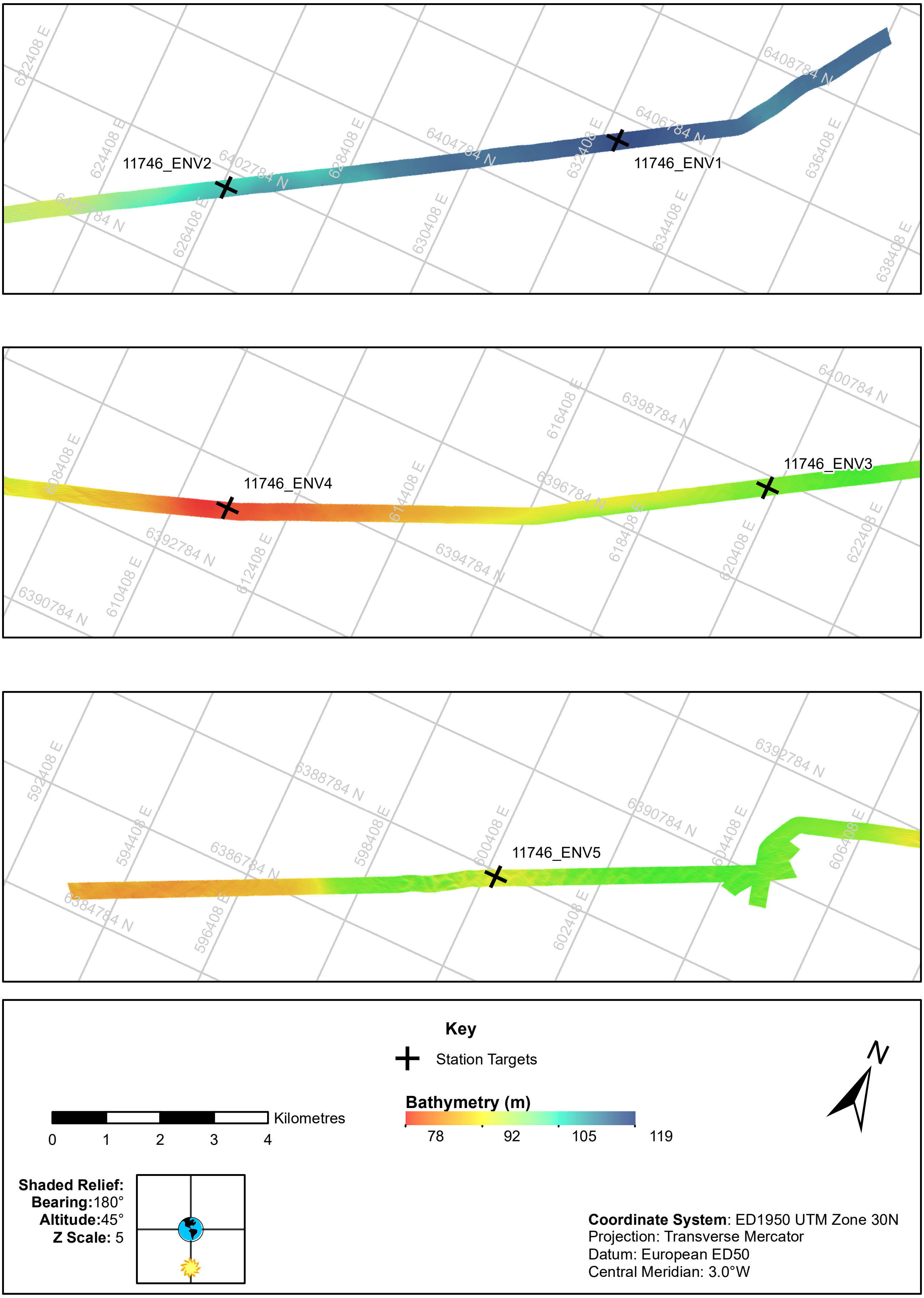


Figure 3.3 Seabed Features – GVDA and Green Volt to Buzzard ECR

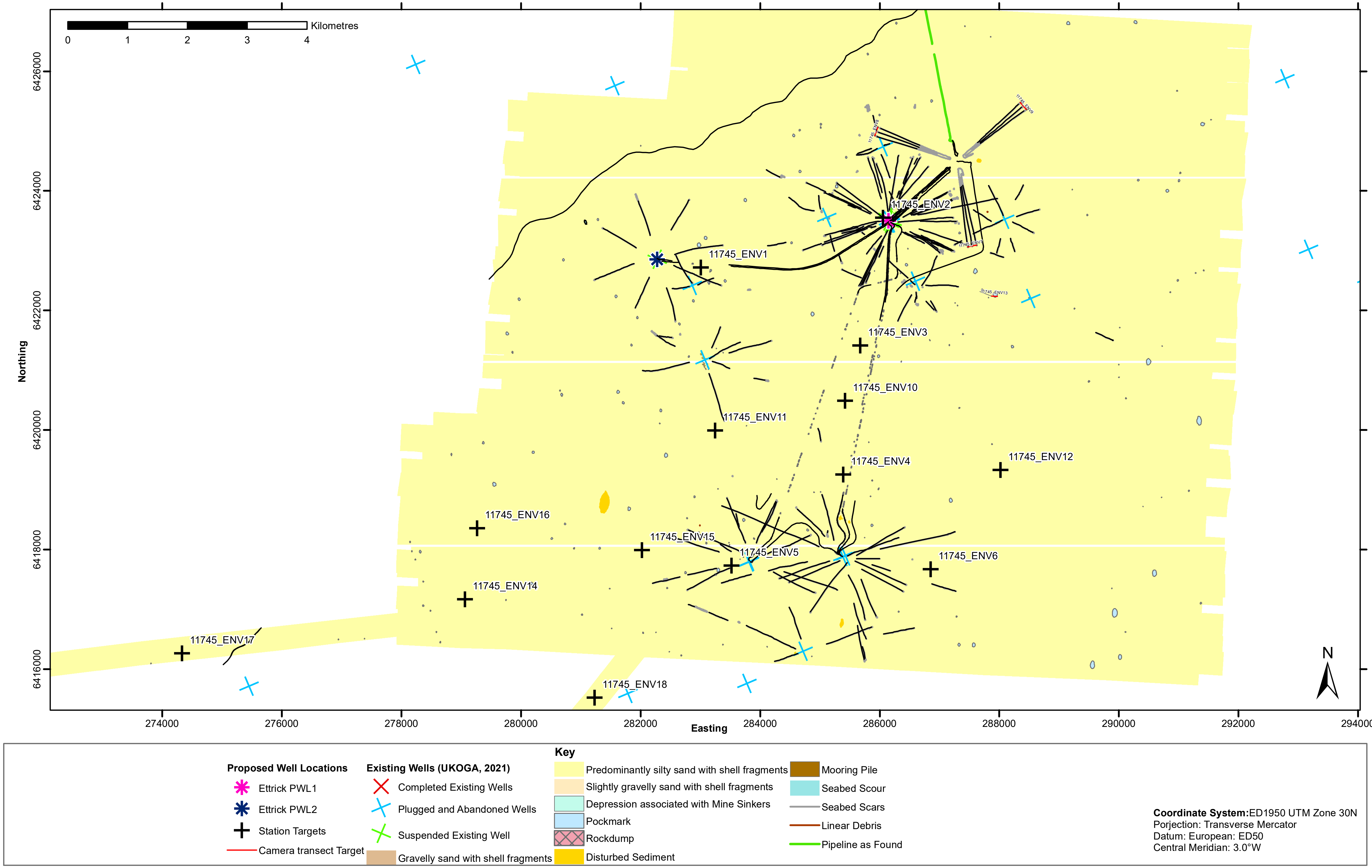
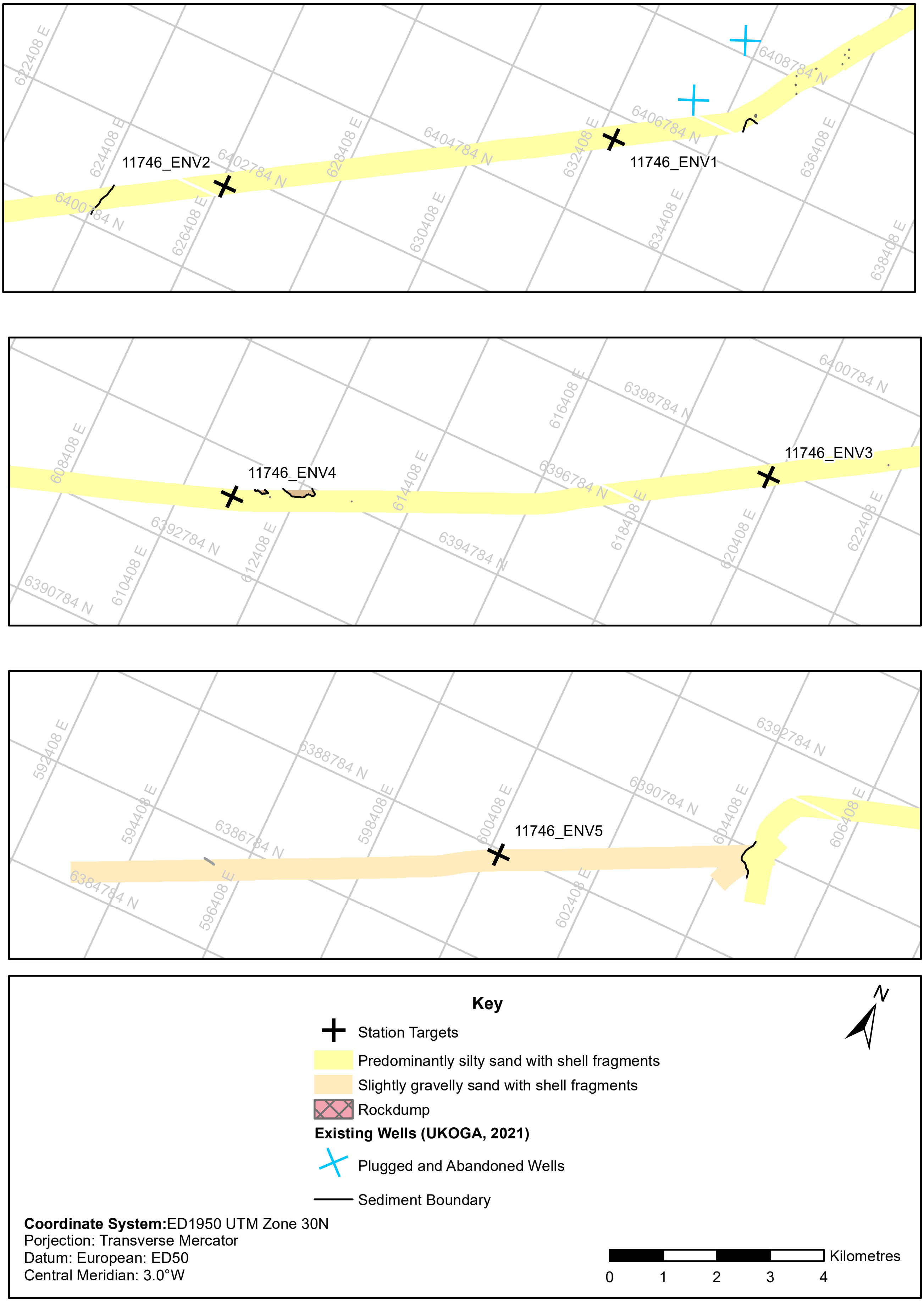


Figure 3.4 Seabed Features – Green Volt to 12NM Limit ECR



3.4 Seabed Imagery Observations

A selection of seabed photographs, together with descriptions and positions are presented in Appendix B, while a summary of all taxa identified from each station is presented in Appendix C.

Seabed imagery and footage across the fifteen stations and four transects generally supported the interpretation of the geophysical data, confirming seabed sediments to comprise silty sand with shell fragments within the GVDA. Sediments become less silty towards the 12NM limit with small patches of weathered *S. spinulosa* tube aggregations.

Visible fauna identified to the lowest taxonomic level with confidence included:

- Annelida (*Ampharete falcata,* Echiura, *Hyalinoecia tubicola*, *Oxydromus flexuosus,* Serpulidae, Terebellidae)
- Arthropoda (*Cancer pagurus*, Caridea, Cirripedia, Decapoda, *Ebalia* sp., *Lithodes maja*, *N. norvegicus*, Paguroidea, *Pagurus prideaux*, Pycnogonida)
- Bryozoa (*Reteporella* sp.)
- Chordata (Actinopterygii, *cf*. *Ammodytes* sp., *Eutrigla gurnardus*, *Gadus morhua, Glyptocephalus cynoglossus,* Gobiidae*, Limanda limanda,* Lotidae, *Melanogrammus aeglefinus, Molva molva, Myxine glutinosa,* Pleuronectiformes)
- Cnidaria (Actinaria, *Adamsia* sp., *Alcyonium digitatum*, *Cellaria* sp., Ceriantharia, *Hormathia digitata,* Hydrozoa, *Nemertesia* sp., *Pennatula phosphorea*, *Tubularia indivisa*, *Virgularia* sp., Zoantharia)
- Echinodermata (*Asterias rubens*, Asteroidea, *Astropecten irregularis*, *cf*. *Echinus esculentus*, *Echinocardium cordatum*, *Hippasteria* sp., *Luidia sarsi*, *Ophiura* sp.)
- Mollusca (Anomiidae, Buccinidae, *Fjordia browni*, Naticidae, Octopoda, Pectinidae, Scaphopoda, Sepiida)
- Porifera

Additionally, bioturbation in the form of faunal tracks and burrows were observed, along with indeterminate Animalia, faunal turf and tubes.

Overall, the most observed taxa or features were *Ampharete falcata* (present in 60% of stills), burrows (present in 56% of stills), Annelida tubes (53%), the cnidarian *P. phosphorea* (49%), faunal turf (27%), the arthropod Paguroidea (18%). The extent to which the seabed resembled a ‘sea pen and burrowing megafauna communities’ habitat, , which is listed as a threatened and/or declining habitat (OSPAR, 2008), is assessed in more detail in Section 3.5. Resemblance to EUNIS biotope A5.361 (sea pens and burrowing megafauna in circalittoral fine mud), which is a component biotope of the Scottish PMF (JNCC, 2012) ‘burrowed mud’ habitat, is reviewed in Section 3.5 and in the EBS (Gardline, In progressa).

Anthropogenic debris in the form of a plastic cable/zip-tie, was observed in two locations at Transect 11745_ENV7, and a piece of possible rope, a short length of garden hose pipe, and some discarded fighting net were observed at Transect 11745_ENV8, positions detailed below in Table 3.1.

Table 3.1 Anthropogenic Debris

Station	Fix	Easting	Northing	Depth (m)	Debris Description
11745_ENV7	175	643078	6419981	111	Cable/Zip tie
11745_ENV7	236	643217	6420022	111	Cable/Zip tie
11745_ENV7	237	643218	6420021	111	Cable/Zip tie
11745_ENV8	342	643227	6420022	111	Rope
11745_ENV8	370	641367	6421692	111	Hosepipe
11745_ENV8	371	641365	6421689	112	Fishing Gear

3.5 Sea Pen and Burrowing Megafauna Communities Assessment

Seabed imagery revealed that sediment burrows and sea pens were present at all stations and transects across the GVDA, both stations designated along the Green Volt to Buzzard ECR corridor and all stations along the Green Volt to 12NM Limit ECR corridor. Therefore, a detailed assessment of the 'sea pen and burrowing megafauna communities' habitat as defined by OSPAR (2010a) was conducted, referring to the MNCR SACFOR abundance scale (JNCC, 2013). The densities of burrows and sea pens were categorised using the SACFOR classification to assess the similarity of the locations to a 'sea pen and burrowing megafauna communities' habitat. The results of this assessment are tabulated in Table 3.2 and a map spatially illustrating abundance of sea pens per image is presented in Figure 3.5.

The average burrow and sea pen densities were calculated for each station and transect using the total area covered by the seabed imagery (average swathe width x camera transect length). Average image swathe width was calculated on a per station or transect basis using the laser scaling present within the image to provide an estimate of the swathe covered by that image.

Within the GVDA burrow densities ranged from 0.3 burrows m^{-2} at Station 11745_ENV8 to 2.6 burrows m^{-2} at Station 11745_ENV11. Burrows across the GVDA were estimated to be between 0.1 to 22.1cm in diameter. Burrow densities at the two stations targeting the Green Volt to Buzzard ECR ranged from 0.1 burrows m^{-2} at Station 11745_ENV17 to 1.9 burrows m^{-2} at Station 11745_ENV14 with burrows estimated as between 0.1cm to 14.3cm in diameter. Where burrows were observed along the Green Volt to 12NM Limit ECR burrow densities ranged from 0.3 burrows m^{-2} at Station 11746_ENV4 and 11746_ENV5 to 2.4 burrows m^{-2} at Station 11746_ENV1. Burrows along the Green Volt to 12NM Limit ECR were estimated to be between 0.1 to 7.8cm in diameter.

In accordance with SACFOR, burrow densities were classified as 'rare' to common' at Station 11745_ENV1, 'occasional to 'abundant' at Station 11745_ENV2 and Transect 11745_ENV9, 'rare' to 'frequent' at Stations 11745_ENV5, 11745_ENV12, 11745_ENV16 and Transects 11745_ENV7 and 11745_ENV8, and 'occasional' to 'common' at all the remaining stations within the GVDA. The two stations along the Green Volt to Buzzard ECR were classified as 'Rare' to 'Occassional' and 'Occassional' to 'Common'. While along the Green Volt to 12NM Limit ECR the burrow densities were classified as 'rare' to 'frequent' and Station 11745_ENV18', 'occasional' to 'common' at 11746_ENV1, 'rare' to 'occasional' at 11746_ENV2 and rare at the remaining three stations.

Sea pens (Pennatulacea) were observed at all stations across the GVDA, both stations along the Green Volt to Buzzard ECR and at four stations along the Green Volt to 12NM Limit ECR, with a total of 2041 individuals recorded. Of these, three were identified as *Virgularia* sp., with the remaining identified as *P. phosphorea*. Overall, the mean density of Pennatulacea, calculated from seabed imagery across the surveyed area, was 1.7 individuals per m^2 with observed specimens measuring between 0.1 to 13.7cm. The resulting SACFOR scores encompassed the 'frequent' classification and all stations and transects, as displayed in Table 3.2.

The JNCC (2014) clarification report states that to be considered a 'sea pen and burrowing megafauna community' habitat, densities of burrows and/or mounds, together with sea pens if present should be classified as 'frequent' or above on the SACFOR scale. Both sea pens and burrows were classified within a range that encompassed 'frequent' at all stations and transects across the GVDA. Station 11745_ENV14 was classified as 'occasional' to 'frequent, while two stations along the proposed Green Volt to 12NM Limit ECR encompassed 'frequent', Station 11745_ENV18 and Station 11746_ENV1, which lie closest to the GVDA. Therefore the GVDA, shows a similarity to the 'sea pen and burrowing megafauna communities' as defined by OSPAR (2010a). The habitat is also listed as a component biotope of the burrowed mud habitat which is a PMF (JNCC, 2012).

Furthermore, several individuals of the taxa *N. norvegicus* were observed at Transects 11745_ENV5, 11745_ENV7, 11745_ENV9, 11745_ENV13 and Stations 11745_ENV15 and 11746_ENV1. This species is considered as a 'megafauna' species within the 'sea pen and burrowing megafauna community' habitat classification. Although 'sea pen and burrowing megafauna community' habitat is on the OSPAR (2008) list of threatened and/or declining species and habitats, it is widespread throughout the northern North Sea, around the south and west coasts of Norway and around the north of the British Isles (OSPAR, 2010b; Hill *et al.*, 2020).

Table 3.2 Total Sea Pens and Faunal Burrows Qualification

Station	Designation[1]	Total Number of Images Assessed	Transect Length (m)	Mean Image Area (m2)	Estimated Area Investigated (m^2)	Burrows				Pennatulacea					
						Total Number of Burrows	Size Range of Burrows (cm)	Density of Burrows (Burrows m^{-2})	SACFOR Range[2]	Total Number of *P. phosphorea*	Total Number of *Virgularia sp.*	**Total Pennatulacea**	Size Range of Pennatulacea (cm)	Density of Pennatulacea (m^{-2})	SACFOR Range[2]
11745_ENV1	3.2km WSW	80	81	0.77	63.0	48	0.1 to 16	0.8	R to C	137		**137**	0.5 to 13.7	2.2	O to C
11745_ENV2	0.1km WNW	43	53	0.64	34.2	57	0.1 to 16.5	1.7	O to A	33		**33**	0.8 to 8.6	1.0	R to F
11745_ENV3	2.1km S	67	54	0.78	42.1	75	0.1 to 7.8	1.8	O to C	112		**112**	0.6 to 8.1	2.7	O to C
11745_ENV4	4.3km S	57	54	0.73	39.1	72	0.1 to 9.1	1.8	O to C	63		**63**	0.7 to 6.5	1.6	O to C
11745_ENV5	6.3km SSW	68	68	0.73	49.5	41	0.1 to 11.4	0.8	R to F	71		**71**	0.3 to 6.3	1.4	O to C
11745_ENV6	5.9km SSE	47	55	0.67	36.9	68	0.1 to 11.4	1.8	O to C	56		**56**	0.6 to 5.5	1.5	O to C
11745_ENV7	1.4km ESE	170	182	0.71	129.2	66	0.1 to 12.7	0.5	R to F	144		**144**	0.7 to 12.9	1.1	O to C
11745_ENV8	14.4km NNW	142	173	0.72	124.0	39	0.2 to 12	0.3	R to F	148		**148**	0.4 to 7.3	1.2	O to C
11745_ENV9	2.9km NE	131	177	0.68	119.5	149	0.1 to 22.1	1.2	O to A	88		**88**	0.5 to 9.8	0.7	R to F
11745_ENV10	3.1km S	63	66	0.73	48.0	58	0.1 to 8.5	1.2	O to C	86		**86**	1.1 to 11	1.8	F to C
11745_ENV11	4.6km SW	59	49	0.74	36.2	96	0.1 to 11.7	2.6	O to C	92		**92**	0.7 to 11.7	2.5	O to C
11745_ENV12	4.6km SSE	32	64	0.65	41.6	27	0.1 to 13.1	0.6	R to F	20		**20**	1.3 to 8.1	0.5	O to F
11745_ENV13	2.1km ESE	77	120	0.73	87.0	110	0.1 to 11.1	1.3	O to C	78		**78**	0.1 to 10.5	0.9	R to F
11745_ENV15	6.9km SSW	56	52	0.76	39.6	71	0.1 to 6.6	1.8	O to C	84	2	**86**	0.5 to 8.3	2.1	O to C
11745_ENV16	8.6km SW	37	67	0.70	47.0	34	0.2 to 8.5	0.7	R to F	50		**50**	0.6 to 9.6	1.1	O to C
11745_ENV14	9.5km SW	59	58	0.84	48.3	93	0.1 to 14.3	1.9	O to C	61		**61**	1.1 to 10.5	1.3	F to C
11745_ENV17	13.9km SW	51	40	0.76	30.6	4	0.2 to 1.1	0.1	R to O	53		**53**	0.4 to 7.3	1.7	O to C
11745_ENV18	9.4km SSW	63	55	0.74	41.2	25	0.2 to 6	0.6	R to F	82		**82**	0.6 to 9.8	2.0	O to C
11746_ENV1	16.6km SSW	74	73	0.65	47.3	114	0.1 to 7.8	2.4	O to C	66		**66**	0.5 to 12.2	1.4	O to C
11746_ENV2	23.5km SW	108	70	0.75	52.6	26	0.1 to 2	0.5	R to O	487	1	**488**	0.2 to 6.8	9.3	O to C
11746_ENV3	30.6km SW	41	42	0.57	24.0	1	0.2 to 0.4	0.0	R	27		**27**	1.2 to 8.5	1.1	F to C
11746_ENV4	40.2km SW	17	37	0.39	14.3	4	0.1 to 0.4	0.3	R						
11746_ENV5	43.8km WSW	24	49	0.42	20.6	6	0.2 to 0.6	0.3	R						
Total		**1566**	**1739**	**0.70**	**1215.7**	**1284**	**0.1 to 22.1**	**1.1**	**O to C**	**2038**	**3**	**2041**	**0.1 to 13.7**	**1.7**	**O to C**

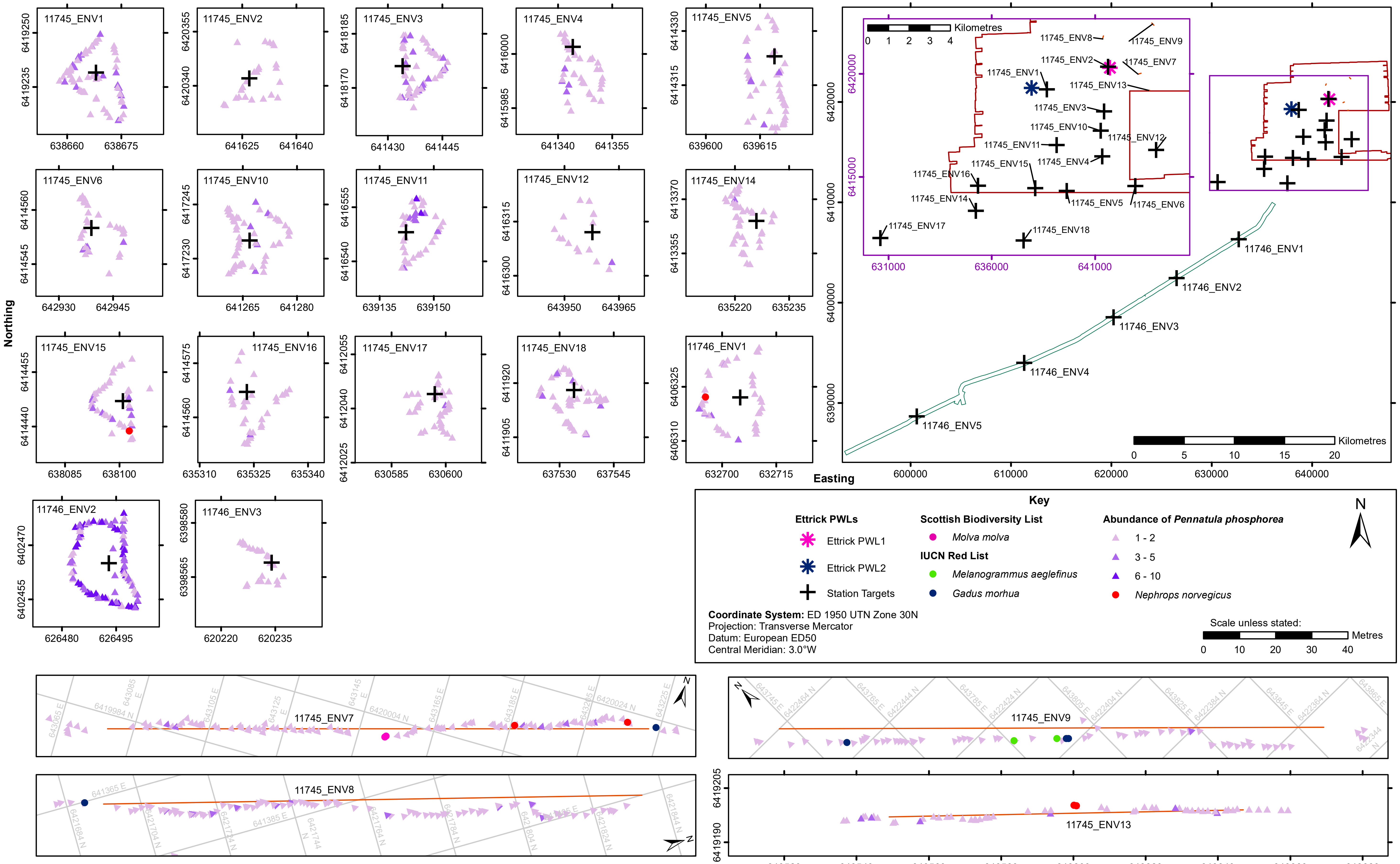
1 Designation is the distance and direction from Ettrick PWL1

2 SACFOR classification scale S=Superabundant, A=Abundant, C=Common, F=Frequent, O=Occasional and R=Rare Classification based on minimum and maximum estimated size of sea pen and burrows and the respective mean density at each station and transect

Table 3.3 Application of SACFOR abundance ranges to OSPAR (2010a) 'sea pen and burrowing megafauna communities' habitat

Ranges			
< Frequent No similarity	≤Frequent Some similarity	< and > Frequent Some Similarity	≥Frequent Greatest Similarity

Figure 3.5 Sea Pen Occurences



3.6 Biogenic Reefs – *Sabellaria spinulosa*

Small aggregations of weathered *S. spinulosa* tubes (Figure 3.6) were observed at Station 11746_ENV5. The aggregations were eroded and encrusted with faunal turf. Biogenic reefs of *S. spinulosa* are listed under Annex I of the Habitats Directive (1992). However due to the degraded nature and scattered presence of the tubes occurring. During imagery analysis the maximum coverage in a single image of *S. spinulosa* was <1% there no further analysis was carried out.

Figure 3.6 Examples of *S. spinulosa* presence

Station: 11746_ENV5 Fix: 12

Station: 11746_ENV5 Fix: 7

3.7 Submarine Structures Made by Leaking Gas

There was no evidence of MDAC or active fluid escape (*e.g.* gas bubbles, bacterial mats) observed at Transect 11745_ENV13 which was designated to traverse a potential pockmark.

There was no evidence of any increase in faunal density or notable shift in faunal community associated with the pockmarks/depressions and the survey area did not show a similarity to Annex I 'submarine structures made by leaking gases' habitat.

3.8 Other Species of Conservation Interest

Two observations of haddock (*M. aeglefinus*) were recorded at Transect 11745_ENV9. This species is listed as 'vulnerable' on the IUCN Red List (2022) when considering the global assessment; however, it is listed as 'least concern' when considering the European assessment.

Five observations of Atlantic cod (*G. morhua*) were recorded at Transects 11745_ENV7, 11745_ENV8 and 11745_ENV9. This species is listed on the Scottish Biodiversity List (2020) and as a mobile species PMF in Scottish off waters (Marine and Coastal Access Act, 2009; JNCC, 2012). Further, this species is listed as vulnerable on the IUCN Red List (2022) when considering the global assessment, however, it is listed as least concern when considering the European assessment.

Two observations of ling (*M. molva*) were recorded at Transect 11745_ENV7. This species is listed on the Scottish Biodiversity List (2020) and as a mobile species PMF in Scottish off waters (Marine and Coastal Access Act, 2009; JNCC, 2012).

Other than those habitats and species listed above, there was no further evidence from seabed imagery of any habitats listed under the Annex I of the Habitats Directive (1992), any other species or habitats selected as PMF (Marine and Coastal Access Act, 2009). Nor any species listed on the Scottish Biodiversity List (2020), species or habitats on the OSPAR (2008) list of threatened and/or declining species nor any species on the IUCN Red List (2022).

3.9 Sediment Sampling Observations

Sediment sampling was conducted at seven stations across the GVDA, two stations along the Green Volt to Buzzard ECR and five stations along the Green Volt to 12NM Limit ECR. Samples were used to ground truth initial geophysical interpretation and observations were made on the seabed imagery, with results supporting findings. Sediments predominantly comprised muddy sand.

Across the fourteen sampling stations, 56 samples were recovered from 72 deployments, with 3 failed sampling attempts relating to weather conditions which caused the grab to trigger in the water column before reaching the seabed. All remaining failures related to insufficient sample volume being retained by the grab. All samples were acquired within 8m of their target location. A full suite of samples was acquired from each of the fourteen sampling stations using the modified Day grab. Visible fauna observed within the retrieved grab samples included:

- Annelida (Polychaeta)
- Arthropoda (Amphipoda, Brachyura, Gnathidae, Isopoda, Nephoropidae)
- Cnidaria (Anthozoa, Hydrozoa, Pennatulacea)
- Echinodermata (Echinoidea, Ophiuroidea)
- Mollusca (Bivalvia, Gastropoda, Scaphopoda).

A single sea pen individual was observed in a sample from Station 11746_ ENV1. As previously discussed in Section 3.5, Pennatulacea, together with burrows, have the potential to form the 'sea pen and burrowing communities' habitat, which is detailed on the OSPAR (2008) list of threatened and/or declining species and habitats and on species or habitats selected as PMF (Marine and Coastal Access Act, 2009). Although 'sea pen and burrowing megafauna community' habitat is on the OSPAR (2008) list of threatened and/or declining species and habitats, it is widespread throughout the northern North Sea, around the south and west coasts of Norway and around the north of the British Isles (OSPAR, 2010b). A selection of photographs of the recovered samples, together with sample descriptions and positions are given in Appendix B.

3.10 Particle Size Analysis

The results of the PSA, determined using wet and dry sieving, are presented in Table 3.4. Full results and histograms illustrating the particle size distribution at each of the fourteen sampled stations are presented in Appendix D.

The PSA results supported the geophysical interpretation and observations from seabed imagery and recovered sediment samples and presented a variable muddy sand to sand sediment type. Mean particle diameter ranged from 52µm to 315µm, which is described under Wentworth (1922) as coarse silt to medium sand, whereas the median and mode grain sizes were classified very fine sand to medium sand. Sand (≥63µm and <2mm) was the dominant fraction across all stations accounting for between 66% and 95% of the sediment. Gravel (≥2mm) was absent from eight of the stations surveyed and where it was present accounted for <3% of the sediment, Resulting in stations being classified as muddy sand or sand under the modified Folk classification (1954).

Three stations (11745_ENV3, 11745_ENV17 and 11746_ENV4) presented a unimodal distribution with peaks at fine or medium sand. Five stations presented a bimodal distribution with the first peak between 2phi (medium sand) and 3phi (very fine sand), and the second peak between 6.5phi and 7phi (fine silt), while Stations 11745_ENV4, 11745_ENV6, 11745_ENV18, 11746_ENV1, and 11746_ENV3 presented a multimodal distribution with an additional third peak at 1.5phi (medium sand).

Station 11746_ENV5 was somewhat distinct, with the third peak at -2phi (gravel). The gravel component at this station accounts for 2.4% of the overall composition, resulting in a modified folk classification of slightly gravely muddy sand. This corresponds with sampling in an area with degraded clusters of *S. spinulosa* tubes.

Table 3.4 Sediment Characteristics

Station	Designation[1]	Mean Diameter (µm)	Mean Diameter (phi)	Fines %	Sand %	Gravel %	Wentworth Classification of Mean Grain Size	Sorting[2]	Modified Folk Classification
11745_ENV1	3.2km WSW	68	3.9	28.5	71.5	0.0	Very fine sand	Poor	Muddy sand
11745_ENV2	0.1km WNW	82	3.6	24.3	75.7	0.0	Very fine sand	Poor	Muddy sand
11745_ENV3	2.1km S	295	1.8	6.7	93.0	0.3	Medium sand	Poor	Sand
11745_ENV4	4.3km S	64	4.0	28.9	70.9	0.2	Very fine sand	Poor	Muddy sand
11745_ENV5	6.3km SSW	91	3.5	25.1	74.9	0.1	Very fine sand	Very poor	Muddy sand
11745_ENV6	5.9km SSE	55	4.2	33.3	66.2	0.4	Coarse silt	Poor	Muddy sand
11745_ENV16	8.6km SW	93	3.4	22.2	77.8	0.0	Very fine sand	Poor	Muddy sand
11745_ENV14	9.5km SW	86	3.5	22.6	77.4	0.0	Very fine sand	Poor	Muddy sand
11745_ENV17	13.9km SW	253	2.0	7.3	92.7	0.0	Medium sand	Poor	Sand
11745_ENV18	9.4km SSW	60	4.1	30.9	69.1	0.0	Coarse silt	Poor	Muddy sand
11746_ENV1	16.6km SSW	52	4.3	34.3	65.7	0.0	Coarse silt	Poor	Muddy sand
11746_ENV3	30.6km SW	66	3.9	28.4	71.6	0.0	Very fine sand	Poor	Muddy sand
11746_ENV4	40.2km SW	315	1.7	4.0	95.2	0.8	Medium sand	Moderate	Sand
11746_ENV5	43.8km WSW	170	2.6	16.0	81.6	2.4	Fine sand	Poor	Slightly gravelly muddy sand
This Study	**Minimum**	**52**	**1.7**	**4.0**	**65.7**	**0.0**	**Coarse silt to medium sand**	**Very poor to moderate**	**Muddy sand to sand**
	Maximum	**315**	**4.3**	**34.3**	**95.2**	**0.8**			
	Mean	**122**	**3.4**	**22.8**	**77.1**	**0.1**			
	± SD	**96**	**0.9**	**10.3**	**10.2**	**0.2**			

Sediments were not treated to remove carbonates prior to particle size analyses.

1 Station designation is the distance and direction from the Ettrick PWL1

2 Sorting according to Folk and Ward (1957).

3.11 EUNIS Habitat Classification

The EUNIS classification hierarchy to biotopes (level 5) were mainly based on geophysical, PSA, depth and seabed imagery, with results detailed in Table 3.5. All habitats observed related to EUNIS level 1 environment marine habitats (EUNIS habitat type code A) and level 2 broad habitat sublittoral sediment (EUNIS habitat type code A5), corresponding to sediment habitats in the sublittoral near shore zone extending up to 200m depth. Sublittoral sediments can range from boulders and cobbles, through pebbles and shingle, coarse sands, sand, fine sand, muds and mixed sediments (European Environment Agency, 2020).

EUNIS level 3 habitat classification was determined based on geophysical data, seabed imagery interpretation of the seabed composition and the results of the PSA where available. All stations and transects were classified as EUNIS habitat type code A5.3 sublittoral mud. One EUNIS level 4 category also encompassed all stations within the GVDA and three of the stations on the Green Volt to 12NM Limit ECR: EUNIS habitat type code A5.36, circalittoral fine mud. This category is described by the EEA (2020), as habitats with sublittoral muds, occurring below moderate depths of 15-20m. The sea pens *V. mirabilis* and *P. phosphorea* are characteristic of this habitat type together with the burrowing anemone *C. lloydii* and the ophiuroid *Amphiura* spp. The relatively stable conditions often lead to the establishment of communities of burrowing megafaunal species, such as *N. norvegicus*.

All stations within the GVDA, the two stations along the Green Volt to Buzzard ECR and four stations on the Green Volt to 12NM Limit ECR were classified to EUNIS level 5 habitat type code A5.361 ‘seapens and burrowing megafauna in circalittoral fine mud’. This category is described by the EEA (2020), as plains of fine mud that may be heavily bioturbated by burrowing megafauna, burrows and mounds may form a prominent feature of the sediment surface with conspicuous populations of sea pens, typically *V. mirabilis* and *P. phosphorea*. The burrowing fauna present typically include *N. norvegicus* and *C. lloydii*.

It should be noted that although large amounts of sea pens and burrows were observed in the sea bed imagery there were some stations with a physical mismatch with the PSA data obtained within the samples. A better fit of EUNIS category may be established upon inclusion of the macrofauna data included within the EBS (Gardline, In progressa).

Transects 11745_ENV 7, 11745_ENV8 and 11745_ENV9 within the GVDA were selected to assess the abandoned anchor mooring piles. Where the seabed imagery tranversed the mooring piles the substrate was classified to EUNIS level 4 habitat type code A6.12 deep-sea artifical hard substrata. However, the sediment classification for the seabed surrounding the anchor mooring piles remained consistent with the surrounding GVDA assessment as presented in Table 3.5.

The two remaining stations were classified as level 4 EUNIS habitat type code A5.35, circalittoral sandy mud. This category is described by the EEA (2020), as habitats with typically over 20% silt/clay, occurring below moderate depths of 10m. Sea pens such as *V. mirabilis* and brittlestars such as *Amphiura* spp. are characteristic of this habitat.

Table 3.5 EUNIS Habitat Classification

Station	Designation[1]	Observed Depth (m)	Modified Folk Classification	EUNIS Habitat Classification	
				Habitat Type	Code
11745_ENV1	3.2km WSW	114	Mud and sandy mud	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV2	0.1km WNW	111	Mud and sandy mud	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV3	2.1km S	113	Sand and muddy sand	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV4	4.3km S	113	Mud and sandy mud	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV5	6.3km SSW	111	Mud and sandy mud	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV6	5.9km SSE	113	Mud and sandy mud	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV7	1.4km ESE	111		Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV8	14.4km NNW	111		Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV9	2.9km NE	112		Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV10	3.1km S	114		Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV11	4.6km SW	113		Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV12	4.6km SSE	116		Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV13	2.1km ESE	114		Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV15	6.9km SSW	111		Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV16	8.6km SW	115	Mud and sandy mud	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV14	9.5km SW	118	Mud and sandy mud	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV17	13.9km SW	98	Sand and muddy sand	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11745_ENV18	9.4km SSW	115	Mud and sandy mud	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11746_ENV1	16.6km SSW	121	Mud and sandy mud	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11746_ENV2	23.5km SW	110		Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11746_ENV3	30.6km SW	98	Mud and sandy mud	Seapens and burrowing megafauna in circalittoral fine mud	A5.361
11746_ENV4	40.2km SW	82	Sand and muddy sand	Circalittoral sandy mud	A5.35
11746_ENV5	43.8km WSW	94	Sand and muddy sand	Circalittoral sandy mud	A5.35

1 Station designation is the distance and direction from Ettrick PWL1

4 CONCLUSION

Overall, seabed sediments across the GVDA and Green Volt to Buzzard ECR comprised muddy sand to sand, with sediments along the Green Volt to 12NM Limit ECR becoming coarser with a small gravel component. Pockmarks, depressions and buried ploughmarks were present throughout the GVDA with the exception of the bathymetric shoal in the northwest. Megaripples and occasional sandwaves were expressed along the Green Volt to 12NM Limit ECR.

Burrows were present in approximately half of the seabed photographs, with SACFOR densities reaching 'frequent' or more at all stations and transects, with the exception of Stations 11746_ENV2, 11746_ENV3, 11746_ENV4 and 11746_ENV5 which reached 'rare' or 'rare' to 'occasional' in the case of 11746_ENV2. Overall, with the exception of Station 11746_ENV4 and 11746_ENV5, the surveyed area showed some similarity to a 'sea pen and burrowing megafauna community' habitat, which is listed as a threatened and/or declining habitat (OSPAR, 2010a) and the Scottish PMF (JNCC, 2012) 'burrowed mud' habitat. However, this habitat is known to be widespread throughout the northern North Sea, around the south and west coasts of Norway and around the north of the British Isles (OSPAR, 2010b; Hill *et al.*, 2020).

Two observations of *M. aeglefinus* were recorded at Transect 11745_ENV9. This species is listed as vulnerable on the IUCN Red List (2022) when considering the global assessment; however, it is listed as least concern when considering the European assessment. Five observations of *G. morhua* were recorded throughout the survey area, this species is listed on the Scottish Biodiversity List (2020) and as a mobile species PMF in Scottish off waters (Marine and Coastal Access Act, 2009; JNCC, 2012). Further, this species is listed as vulnerable on the IUCN Red List (2022) when considering the global assessment. However, it is listed as least concern when considering the European assessment. Two observations of *M. molva* were recorded at Transect 11745_ENV7. This species is listed on the Scottish Biodiversity List (2020) and as a mobile species PMF in Scottish off waters (Marine and Coastal Access Act, 2009; JNCC, 2012).

Small aggregations of weathered *S. spinulosa* tubes were observed at Station 11746_ENV5. The aggregations were eroded and encrusted with faunal turf. Biogenic reefs of *S. spinulosa* are listed under Annex I of the Habitats Directive (1992).

Other than those habitats and species listed above, there was no further evidence from seabed imagery of any habitats listed under the Annex I of the Habitats Directive (1992), any other species or habitats selected as PMF (Marine and Coastal Access Act, 2009). Nor any species listed on the Scottish Biodiversity List (2020), species or habitats on the OSPAR (2008) list of threatened and/or declining species nor any species on the IUCN Red List (2022).

All stations and transects were classified to the EUNIS (European Environment Agency, 2020), level 5 biotope A5.361 (sea pens and burrowing megafauna in circalittoral fine mud), with the exception of Stations 11746_ENV4 and 11746_ENV5 which were classified to level 4 biotope A5.35 (circalittoral sandy mud).

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APPENDICES

APPENDIX A FIELD SAMPLING LOGS

APPENDIX A FIELD SAMPLING LOGS

SEABED IMAGERY LOG SHEET (Deck)					FOR-ENV-0538
Job No:	11745	Area:	UKCS 20/2 & 20/3	Scale:	STR MP-GLP-3000A SeaDot Laser
Project:	Ettrick Debris Clearance and Green Volt Environmental Surveys			Equipment:	STR SeaSpyder
Client:	CNOCC Petroleum Europe Limited			Vessel:	MV *Kommandor*

Station Number	Date	Time on Overlay Start	Time on Overlay Finish	Media Location			Sediment Description	Fauna Description	Operator(s)	No. of Photos	First Fix No.	Last Fix No.	Comments
				VHS No.	DVD No. & Chapter	HDD File Name(s)							
11745_ENV6_C	20-Sep-2021	09:29:39	09:47:29			2021_09_20_092943181.avi	Fine, silty sand, faunal burrows and worm tubes.	Annelida (Polychaeta), Arthropoda (Paguridae), Cnidaria (Pennatulidae), Echinodermata (Echinoidea).	AM, AS	30	1	30	
11745_ENV4_C	20-Sep-2021	10:43:32	11:09:55			2021_09_20_104336276.avi	Fine, silty sand, faunal burrows and worm tubes.	Annelida (Polychaeta), Arthropoda (Paguridae), Cnidaria (Actinaria, Pennatulacea), Echinodermata (Asteroidea), Mollusca (Scaphopoda).	AM, AS	27	31	57	
11745_ENV5_C	20-Sep-2021	12:00:58	12:25:53			2021_09_20_120101989.avi	Fine, silty sand, infrequent faunal burrows and worm tubes.	Annelida (Polychaeta), Arthropoda (Brachyura, Paguridae), Chordata (Actinopterygii, Myxiniformes), Cnidaria (Hydrozoa, Pennatulacea), Mollusca (Scaphopoda), Porifera.	SK, GR	27	58	84	
11745_ENV3_C	20-Sep-2021	13:22:28	13:45:44			2021_09_20_132230073.avi	Fine, silty sand, faunal burrows, shell fragments, worm casts.	Annelida (Polychaeta), Arthropoda (Paguridae), Chordata (Actinopterygii), Cnidaria (Actinaria, Hydrozoa, Pennatulacea), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda), Porifera.	SK, GR	25	85	109	
11745_ENV1_C	20-Sep-2021	14:30:02	14:59:05			2021_09_20_143006732.avi 2021_09_20_145709319.avi	Fine, silty sand, infrequent faunal burrows, surface tracks, worm tubes.	Annelia (Polychaeta), Arthropoda (Decapoda, Paguridae), Cnidaria (Actinaria, Pennatulacea), Mollusca (Scaphopoda).	SK, GR	27	110	136	
11745_ENV2_C	20-Sep-2021	15:57:23	16:20:35			2021_09_20_155726841.avi	Fine, silty sand, occasional faunal burrows, surface tracks and worm tubes.	Annelida (*Oxydromus* sp., Polychaeta), Arthropoda (Decapoda, Paguridae), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (Pennatulacea), Echinodermata (Asteroidea), Mollusca (Gastropoda, Scaphopoda).	SK, GR	25	137	161	
11745_TR_ENV7	20-Sep-2021	16:58:27	17:55:57			2021_09_20_165831884.avi 2021_09_20_172541938.avi 2021_09_20_175235909.avi	Rippled, fine, silty sand with occassional high density stones and boulders, faunal burrows, surface tracks and worm tubes.	Annelida (Polychaeta, Serpulidae) Arthropoda (Brachyura, *Cancer pagurus*, *Nephrops norvegicus*, Paguridae), Bryozoa, Chordata (Actinopterygii, Gadidae, Myxiniformes, Pleuronectiformes, Triglidae), Cnidaria (Actiniaria, Hydrozoa, Pennatulacea), Echinodermata (Asteroidea, Echinoidea), Mollusca (Gastropoda, Octopoda, Scaphopoda).	SK, GR	86	162	245	Gloves, cable ties.
11745_TR_ENV9	20-Sep-2021	18:49:01	20:05:42			2021_09_20_184907000.avi 2021_09_20_184946128.avi 2021_09_20_190607434.avi 2021_09_20_193314641.avi 2021_09_20_200021227.avi	Fine, silty sand with shell fragments and occassional high density stones and boulders.	Annelida (*Oxydromus* sp., Polychaeta), Arthropoda (Brachyura, *C. pagurus*, *N. norvegicus*, Paguridae), Bryozoa, Chordata (Actinopterygii, Gadidae, *Melanogrammus aeglefinus*, Perciformes, Pleuronectiformes, *Trichiuridae* sp.), Cnidaria (Actinaria, Hydrozoa, Pennatulacea), Echinodermata (Asteroidea), Mollusca (Gastropoda, Sepiloidae. Scaphopoda), Porifera	SK, GR	67	246	310	

APPENDIX A FIELD SAMPLING LOGS

SEABED IMAGERY LOG SHEET (Deck)														FOR-ENV-0538
Job No:	11745			Area:	UKCS 20/2 & 20/3			Scale:	STR MP-GLP-3000A SeaDot Laser					
Project:	Ettrick Debris Clearance and Green Volt Environmental Surveys							Equipment:	STR SeaSpyder					
Client:	CNOCC Petroleum Europe Limited							Vessel:	MV *Kommandor*					
Station Number	Date	Time on Overlay Start	Time on Overlay Finish	Media Location			Sediment Description	Fauna Description	Operator(s)	No. of Photos	First Fix No.	Last Fix No.	Comments	
				VHS No.	DVD No. & Chapter	HDD File Name(s)								
11745_TR_ENV8	20-Sep-2021	21:21:03	22:17:32			2021_09_20_212107880.avi 2021_09_20_214819744.avi 2021_09_20_221521398.avi	Fine, silty sand with shell fragments, burrows and occassional high density stones and boulders.	Annelida (*Oxydromus* sp., Polychaeta), Arthropoda (Brachyura, Paguridae), Chordata (Actinopterygii, Gadidae, Pleuronectiformes), Cnidaria (Actinaria, Hydrozoa, Pennatulacea), Echinodermata (Asteroidea, Echinoidea, Ophiuroidea), Mollusca (Gastropoda, Scaphopoda), Porfiera.	SK, GR	67	311	374		
11745_ENV18_C	25-Sep-2021	23:10:12	23:33:53			2021_09_25_230948235.avi	Fine, silty sand with shell fragments, burrows.	Annelida (Pectinariidae, Polychaeta), Arthropoda (Brachyura, Caridea, Euphausiacea, Paguridae), Chordata (Actinopterygii), Cnidaria (Pennatulacea), Echinodermata (Echinoidea), Mollusca (Scaphopoda).	AS, AM	26	406	431		
11745_ENV15_C	26-Sep-2021	00:31:32	00:51:58			2021_09_26_003115095.avi	Fine, silty sand with shell fragments and burrows. Clay protusions observed.	Annelida (Pectinariidae, Polychaeta), Arthropoda (*Nephrops* sp., Paguridae), Chordata (Actinopterygii, Gadidae), Cnidaria (Ceriantharidae, Hydrozoa, Pennatulacea, *Virgularia* sp.), Echinodermata (Asteroidea, Echinoidea), Mollusca (Scaphopoda).	AS, AM	31	432	460		
11745_ENV12_C	26-Sep-2021	02:08:41	02:34:05			2021_09_26_020818635.avi	Fine, silty sand with shell fragments, burrows.	Annelida (*Hyalinoecia tubicola*, *Oxydromus* sp., Pectinaridae, Polychaeta), Arthropoda (*Nephrops* sp., Paguridae), Chordata (Actinopterygii, Myxiniformes), Cnidaria (Actiniaria, Hydrozoa, Pennatulacea), Echinodermata (Asteroidea, Echinoidea), Mollusca (Scaphopoda).	AS, AM	21	461	480		
11745_TR_ENV13	26-Sep-2021	03:53:56	04:34:00			2021_09_26_035341897.avi 2021_09_26_041742842.avi	Fine, silty sand with shell fragments, burrows.	Annelida (Polychaeta), Arthropoda (*Nephrops* sp., Paguridae), Chordata (Pleuronectiformes), Cnidaria (Actiniaria, Pennatulacea, *Virgularia* sp.), Echinodermata (*Asteroidea*, Echinoidea), Mollusca (Scaphopoda).	AS, AM	26	481	506		
11745_ENV10_C	26-Sep-2021	09:33:46	10:00:53			2021_09_26_093330842.avi 2021_09_26_100031061.avi	Fine, silty sand with shell fragments, burrows	Annelida (Polychaeta), Arthropoda (Paguridae), Chordata (Myxiniformes), Cnidaria (Pennatulacea), Echinodermata (Asteroidea, Echinoidea), Mollusca (Scaphopoda).	AS, AM	17	507	523		
11745_ENV11_C	26-Sep-2021	10:52:00	11:16:44			2021_09_26_105145254.avi	Fine, silty sand with regular burrows and worm casts.	Arthropoda (Paguridae), Cnidaria (Pennatulacea), Mollusca (Scaphopoda).	SK, GR	20	524	543		
11745_ENV14_C	29-Sep-2021	09:18:27	09:41:10			2021_09_29_091830956.avi	Fine, silty sand with regular burrows and worm casts.	Annelida (Polychaeta), Arthropoda (*Nephrops* sp.), Echinodermata (Asteroidea, Echinoidea), Chordata (Myxiniformes), Cnidaria (Actiniaria, Pennatulacea), Mollusca (Gastropoda, Scaphopoda).	AS, AM	20	548	567		

APPENDIX A FIELD SAMPLING LOGS

SEABED IMAGERY LOG SHEET (Deck)														FOR-ENV-0538
Job No:	11745			Area: UKCS 20/2 & 20/3				Scale:	STR MP-GLP-3000A SeaDot Laser					
Project:	Ettrick Debris Clearance and Green Volt Environmental Surveys							Equipment:	STR SeaSpyder					
Client:	CNOCC Petroleum Europe Limited							Vessel:	MV *Kommandor*					
Station Number	Date	Time on Overlay Start	Time on Overlay Finish	Media Location			Sediment Description	Fauna Description	Operator(s)	No. of Photos	First Fix No.	Last Fix No.	Comments	
				VHS No.	DVD No. & Chapter	HDD File Name(s)								
11745_ENV16_C	29-Sep-2021	10:42:37	10:52:55			2021_09_29_102926623.avi	Fine, sandy sediment with burrows and surface tracks.	Annelida (*Aphrodita* sp., Polychaeta), Arthropoda (Brachyura), Chordata (Pleuronectiformes), Cnidaria (Pennatulacea), Echinodermata (Asteroidea), Mollusca (Gastropoda).	AS, AM	22	568	587a	First ten minutes of footage missing - most likely a software glitch.	
11745_ENV17_C	29-Sep-2021	12:04:29	12:18:54			2021_09_29_120432642.avi	Silty sand with occasional worm tubes.	Arthropoda (Paguridae), Chordata (Actinopterygii), Cnidaria (Pennatulacea), Echinodermata (Asteroidea), Mollusca (Gastropoda).	SK, GR	18	588	604a		

APPENDIX A FIELD SAMPLING LOGS

SEABED SAMPLING LOG SHEET (Deck)										FOR-ENV-0539
Job No:	11745			Area:	UKCS 20/2, 20/3			Sieve Size: 0.5mm		
Project:	Ettrick Debris Clearance and Green Volt Environmental Surveys							Equipment: Day Grab		
Client:	CNOCC Petroleum Europe Limited							Vessel: MV *Kommandor*		
Sample Number	Station Number	Date	Time	Penetration (%)	Sample Retention	Sample Receptacle	Sediment Description	Fauna Description	Operator(s)	Comments
1	11745_ENV2_G	20-Sep-2021	23:34:00	<40	NS				AM, AS	Low retention.
2	11745_ENV2_G	20-Sep-2021	23:47:00	0	NS				AM, AS	Grab triggered in water column, choppy seas.
3	11745_ENV2_G	20-Sep-2021	23:56:00	0	NS				AM, AS	Grab triggered in water column, choppy seas.
4	11745_ENV2_G	21-Sep-2021	00:16:39	<40	NS				AM, AS	Low retention.
5	11745_ENV2_G	21-Sep-2021	00:35:07	50	MFA	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta)	AM, AS	
6	11745_ENV2_G	21-Sep-2021	00:49:49	30	NS				AM, AS	Low retention.
7	11745_ENV2_G	21-Sep-2021	01:07:33	50	CHEM	2 x glass jars, 4 x ziploc bags	Muddy sand Munsell: 2.5Y 4/2 (Dark grayish brown).		AM, AS	
8	11745_ENV2_G	21-Sep-2021	01:33:25	50	MFB	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta)	AM, AS	
9	11745_ENV2_G	21-Sep-2021	01:48:19	50	MFC	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Echinoidea)	AM, AS	
10	11745_ENV1_G	21-Sep-2021	02:47:31	40	MFA	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Mollusca (Bivalvia)	AM, AS	
11	11745_ENV1_G	21-Sep-2021	03:01:28	40	CHEM	2 x glass jars, 4 x ziploc bags	Muddy sand Munsell: 2.5Y 4/2 (Dark grayish brown).		AM, AS	
12	11745_ENV1_G	21-Sep-2021	03:26:05	50	MFB	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Echinoidea, Ophiuroidea)	AM, AS	
13	11745_ENV1_G	21-Sep-2021	03:39:13	30	NS				AM, AS	Low retention.
14	11745_ENV1_G	21-Sep-2021	03:52:11	40	MFC	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda)	AM, AS	
15	11745_ENV3_G	21-Sep-2021	05:04:54	90	MFA	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Echinoidea, Ophiuroidea), Mollusca (Bivalvia, Scaphopoda)	AM, AS	
16	11745_ENV3_G	21-Sep-2021	05:18:34	80	CHEM	2 x glass jars, 4 x ziploc bags	Muddy sand Munsell: 2.5Y 4/2 (Dark grayish brown).		AM, AS	
17	11745_ENV3_G	21-Sep-2021	05:40:43	70	MFB	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Echinoidea, Ophiuroidea), Mollusca (Bivalvia, Scaphopoda)	AM, AS	
18	11745_ENV3_G	21-Sep-2021	05:53:14	60	MFC	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Gastropoda)	AM, AS	
19	11745_ENV4_G	21-Sep-2021	06:49:21	90	MFA	1 x 1 litre pot	Muddy sand	Arthropod (Isopoda), Annelida (Polychaeta), Mollusca (Gastropoda)	AM, AS	
20	11745_ENV4_G	21-Sep-2021	07:03:15	50	CHEM	2 x glass jars, 4 x ziploc bags	Muddy sand Munsell: 2.5Y 4/2 (Dark grayish brown).		AM, AS	

Gardline

APPENDIX A FIELD SAMPLING LOGS

SEABED SAMPLING LOG SHEET (Deck)										FOR-ENV-0539
Job No:	11745			Area:	UKCS 20/2, 20/3			Sieve Size: 0.5mm		
Project:	Ettrick Debris Clearance and Green Volt Environmental Surveys							Equipment: Day Grab		
Client:	CNOCC Petroleum Europe Limited							Vessel: MV *Kommandor*		
Sample Number	Station Number	Date	Time	Penetration (%)	Sample Retention	Sample Receptacle	Sediment Description	Fauna Description	Operator(s)	Comments
21	11745_ENV4_G	21-Sep-2021	07:28:47	70	MFB	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Bivalvia)	AM, AS	
22	11745_ENV4_G	21-Sep-2021	07:41:00	60	MFC	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Ophiuroidea)	AM, AS	
23	11745_ENV6_G	21-Sep-2021	08:36:48	60	MFA	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Echinoidea, Ophiuroidea), Mollusca (Gastropod, Scaphopoda)	AM, AS	
24	11745_ENV6_G	21-Sep-2021	08:54:37	60	CHEM	2 x glass jars, 4 x ziploc bags	Muddy sand Munsell: 2.5Y 4/2 (Dark grayish brown).		AM, AS	
25	11745_ENV6_G	21-Sep-2021	09:22:12	80	MFB	1 x 1 litre pot	Muddy sand	Annelida (Polyhaete), Echinodermata (Echinoidea), Mollusca (Scaphopoda)	AM, AS	
26	11745_ENV6_G	21-Sep-2021	09:34:53	60	NS		Muddy sand		AM, AS	Partial washout.
27	11745_ENV6_G	21-Sep-2021	09:51:52	80	MFC	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Arthropoda (Amphipoda)	AM, AS	
28	11745_ENV5_G	21-Sep-2021	10:40:00	70	MFA	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Arthropoda (Amphipoda), Echinodermata (Ophiuroidea), Mollusca (Gastropoda, Scaphopoda)	AM, AS	
29	11745_ENV5_G	21-Sep-2021	10:55:00	60	CHEM	2 x glass jars, 4 x ziploc bags	Muddy sand		SK, GR	
30	11745_ENV5_G	21-Sep-2021	11:18:00	50	MFB	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Echinoidea, Ophiuroidea), Mollusca (Scaphopoda)	SK, GR	No DG Photo
31	11745_ENV5_G	21-Sep-2021	11:29:00	50	MFC	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Bivalvia, Scaphopoda)	SK, GR	
32	11745_ENV18_G	29-Sep-2021	07:19:33	60	MFA	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Arthropoda (Brachyura), Mollusca (Scaphopoda)	AM, AS	
33	11745_ENV18_G	29-Sep-2021	07:32:58	60	CHEM	2 x glass jars, 4 x ziploc bags	Muddy sand Munsell: 2.5Y 4/2 (Dark grayish brown).		AM, AS	
34	11745_ENV18_G	29-Sep-2021	07:53:37	70	MFB	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda)	AM, AS	
35	11745_ENV18_G	29-Sep-2021	08:06:11	80	MFC	1 x 1 litre pot	Muddy sand	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda)	AM, AS	
36	11745_ENV17_G	29-Sep-2021	12:51:00	40	MFB	1 x 1 litre pot	Silty, slight anoxic sand with a few shell fragments.	Annelida (Polychaeta), Mollusca (Gastropoda)	SK, GR	
37	11745_ENV17_G	29-Sep-2021	13:00:00	40	MFC	1 x 1 litre pot	Sand with shell fragments.	Annelida (Polychaeta), Echinodermata (Echinoidea), Mollusca (Bivalvia, Gastropoda)	SK, GR	
38	11745_ENV17_G	29-Sep-2021	13:11:00	60	CHEM	2 x glass jars, 4 x ziploc bags	Sand Munsell: 2.5Y 4/2 (Dark grayish brown).		SK, GR	
39	11745_ENV17_G	29-Sep-2021	13:23:00	30	NS				SK, GR	

APPENDIX A FIELD SAMPLING LOGS

SEABED SAMPLING LOG SHEET (Deck)										FOR-ENV-0539
Job No:	11745			Area:	UKCS 20/2, 20/3			Sieve Size: 0.5mm		
Project:	Ettrick Debris Clearance and Green Volt Environmental Surveys							Equipment: Day Grab		
Client:	CNOCC Petroleum Europe Limited							Vessel: MV *Kommandor*		
Sample Number	Station Number	Date	Time	Penetration (%)	Sample Retention	Sample Receptacle	Sediment Description	Fauna Description	Operator(s)	Comments
40	11745_ENV17_G	29-Sep-2021	13:32:00	50	MFA	1 x 1 litre pot	Slighty anoxic sand.	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Bivalvia, Gastropoda)	SK, GR	
41	11745_ENV16_G	29-Sep-2021	14:29:00	30	NS				SK, GR	
42	11745_ENV16_G	29-Sep-2021	14:40:00	40	MFC	1 x 1 litre pot	Slighty anoxic sand.	Annelida (Polychaeta), Echinodermata (Ophiuroidea)	SK, GR	
43	11745_ENV16_G	29-Sep-2021	14:50:00	0	NS				SK, GR	
44	11745_ENV16_G	29-Sep-2021	15:00:00	40	CHEM	2 x glass jars, 4 x ziploc bags	Sand Munsell: 2.5Y 4/2 (Dark grayish brown).		SK, GR	
45	11745_ENV16_G	29-Sep-2021	15:12:00	40	MFA	1 x 1 litre pot	Sand	Annelida (Polychaeta), Arthropoda (Amphipoda), Mollusca (Gastropoda, Scaphopoda)	SK, GR	
46	11745_ENV16_G	29-Sep-2021	15:20:00	50	MFB	1 x 1 litre pot	Sand	Annelida (Polychaeta), Arthropoda (Amphipoda), Mollusca (Scaphopoda)	SK, GR	
47	11745_ENV14_G	29-Sep-2021	16:15:00	50	CHEM	2 x glass jars, 4 x ziploc bags	Sand Munsell: 2.5Y 4/2 (Dark grayish brown).		SK, GR	
48	11745_ENV14_G	29-Sep-2021	16:30:00	40	MFC	1 x 1 litre pot	Sand	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Bivalvia)	SK, GR	
49	11745_ENV14_G	29-Sep-2021	16:40:00	50	MFA	1 x 1 litre pot	Sand	Annelida (Polychaeta), Mollusca (Bivalvia)	SK, GR	
50	11745_ENV14_G	29-Sep-2021	16:49:00	40	MFB	1 x 1 litre pot	Sand	Annelida (Polychaeta), Arthropoda (Amphipoda), Echinodermata (Ophiuroidea), Mollusca (Bivalvia, Scaphopoda)	SK, GR	

APPENDIX A FIELD SAMPLING LOGS

SEABED IMAGERY LOG SHEET (Deck)														QPRO-0753
Job No:	11746		Area:	UKCS 20/7, 20/6, 19/10, 19/15, 19/14				Scale:	STR MP-GLP-3000A SeaDot Laser					
Project:	Green Volt Export Cable Route							Equipment:	STR SeaSpyder					
Client:	CNOCC Petroleum Europe Limited							Vessel:	MV *Kommandor*					
Station Number	Date	Time on Overlay Start	Time on Overlay Finish	Media Location			Sediment Description	Fauna Description	Operator(s)	No. of Photos	First Fix No.	Last Fix No.	Comments	
				VHS No.	DVD No. & Chapter	HDD File Name(s)								
11746_ENV5_C	25-Sep-2021	13:55:03	14:15:21			2021_09_25_135517527.avi	Rippled sand with shell fragments and worm tubes.	Annelida (Polychaeta), Arthropoda (Caridea, Paguridae), Chordata (Pleuronectiformes), Cnidaria (*Alcyonium digitatum* , Hydrozoa), Mollusca (Bivalvia, Scaphopoda), Porifera	SK, GR	23	1	22		
11746_ENV4_C	25-Sep-2021	15:44:48	16:02:00			2021_09_25_154502989.avi	Rippled sand with shell fragments and worm tubes.	Annelida (Polychaeta), Arthropoda (Paguridae), Chordata (Actinopterygii, Pleuronectiformes, Triglidae), Cnidaria (Hydrozoa), Mollusca (Scaphopoda)	SK, GR	17	23	38		
11746_ENV3_C	25-Sep-2021	17:34:48	17:51:23			2021_09_25_173502594.avi	Rippled sand with shell fragments.	Annelida (Polychaeta), Arthropoda (Paguridae), Chordata (Gadidae, Pleuronectiformes), Cnidaria (Actiniaria, Hydrozoa, Pennatulacea), Echinodermata (Asteroidea, Ophiuroidea), Mollusca (Gastropoda, Scaphopoda), Porifera	SK, GR	25	39	62		
11746_ENV2_C	25-Sep-2021	19:36:57	19:59:46			2021_09_25_193640593.avi	Rippled sand.	Annelida (Polychaeta), Arthropoda (Caridea, Paguridae), Chordata (Gadidae, Pleuronectiformes), Cnidaria (Actiniaria, Hydrozoa, Pennatulacea), Echinodermata (Asteroidea, Echinoidea), Mollusca (Gastropoda, Scaphopoda), Porifera	SK, GR	31	63	95		
11746_ENV1_C	25-Sep-2021	21:18:55	21:43:42			2021_09_25_211839214.avi	Rippled silty sand, worm tubes and casts with occasional large burrows.	Annelida (*Oxydromus* sp., Pectinariidae, Polychaeta), Arthropoda (*Nephrops norvegicus*), Chordata (Actinopterygii, Gadidae, Pleuronectiformes), Cnidaria (Hydrozoa, Pennatulacea), Echinodermata (Echinoidea), Mollusca (Bivalvia, Gastropoda, Scaphopoda)	SK, GR	34	95	128		

APPENDIX A FIELD SAMPLING LOGS

SEABED SAMPLING LOG SHEET (Deck)										QPRO-0755
Job No:	11746			Area:	UKCS 20/7, 20/6, 19/10, 19/15, 19/14			Sieve Size: 0.5mm		
Project:	Green Volt Export Cable Route							Equipment: Day Grab		
Client:	CNOCC Petroleum Europe Limited							Vessel: MV *Kommandor*		
Sample Number	Station Number	Date	Time	Penetration	Sample Retention	Sample Receptacle	Sediment Description	Fauna Description	Operator(s)	Comments
1	11746_ENV5_G	28-Sep-2021	20:44:00	50	MFA	1x 5L Bucket	Muddy sand.	Annelida (Polychaeta), Arthropoda (Nephoropidae), Cnidaria (Anthozoa, Hydrozoa), Echinodermata (Ophiuroidea), Mollusca (Bivalvia).	SK, GR	
2	11746_ENV5_G	28-Sep-2021	20:56:00	80	CHEM	2x Jars, 4x Ziplock	Muddy sand. Munsell: 5YR 4/2 (dark reddish gray).		SK, GR	
3	11746_ENV5_G	28-Sep-2021	21:17:00	60	MFB	1x 1L pot	Anoxic sand.	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda).	SK, GR	
4	11746_ENV5_G	28-Sep-2021	21:24:00	50	MFC	1x 5L Bucket	Anoxic sand.	Annelida (Polychaeta), Arthropoda (Brachyura), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda).	SK, GR	
5	11746_ENV4_G	28-Sep-2021	22:32:00	40	MFC	1x 5L Bucket	Sand with shell fragments and pebbles.	Annelida (Polychaeta), Mollusca (Scaphopoda).	SK, GR	
6	11746_ENV4_G	28-Sep-2021	22:40:00	60	CHEM	2x Jars, 4x Ziplock	Sand with shell fragments. Munsell: 5YR 4/2 (dark reddish gray).		SK, GR	
7	11746_ENV4_G	28-Sep-2021	23:06:00	50	MFA	1x 5L Bucket	Sand with shell fragments and pebbles.	Annelida (Polychaeta), Mollusca (Scaphopoda).	AM, AS	
8	11746_ENV4_G	28-Sep-2021	23:19:00	40	MFB	1x 5L Bucket	Sand with shell fragments and pebbles.	Annelida (Polychaeta), Echinodermata (Echinoidea), Mollusca (Scaphopoda).	AM, AS	
9	11746_ENV3_G	29-Sep-2021	00:40:00	50	MFA	1x 5L Bucket	Sand with shell fragments.	Annelida (Polychaeta), Mollusca (Scaphopoda).	AM, AS	
10	11746_ENV3_G	29-Sep-2021	00:55:00	40	MFB	1x 5L Bucket	Sand with shell fragments.	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda).	AM, AS	
11	11746_ENV3_G	29-Sep-2021	01:04:00	<40	N/S	1x 5L Bucket			AM, AS	Wash out.
12	11746_ENV3_G	29-Sep-2021	01:15:00	50	CHEM	2x Jars, 4x Ziplock	Sand with shell fragments. Munsell: 2.5YR 4/2 (dark grayish brown).		AM, AS	
13	11746_ENV3_G	29-Sep-2021	01:30:00	50	MFC	1x 5L Bucket	Sand with shell fragments and pebbles.	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Gastropoda, Scaphopoda).	AM, AS	
14	11746_ENV2_G	29-Sep-2021	02:40:00	<40	NS				AM, AS	Low penetration.
15	11746_ENV2_G	29-Sep-2021	02:58:00	<40	NS				AM, AS	Low penetration.

APPENDIX A FIELD SAMPLING LOGS

SEABED SAMPLING LOG SHEET (Deck)										QPRO-0755
Job No:	11746			Area:	UKCS 20/7, 20/6, 19/10, 19/15, 19/14			Sieve Size: 0.5mm		
Project:	Green Volt Export Cable Route							Equipment: Day Grab		
Client:	CNOCC Petroleum Europe Limited							Vessel: MV *Kommandor*		
Sample Number	Station Number	Date	Time	Penetration	Sample Retention	Sample Receptacle	Sediment Description	Fauna Description	Operator(s)	Comments
16	11746_ENV2_G	29-Sep-2021	03:13:00	<40	NS				AM, AS	Relocated 5m W of target.
17	11746_ENV2_G	29-Sep-2021	03:33:00	<40	NS				AM, AS	Relocated 5m W of target.
18	11746_ENV1_G	29-Sep-2021	05:06:00	90	MFA	1x 1L pot	Muddy sand.	Annelida (Polychaeta), Cnidaria (Pennatulacea), Echinodermata (Echinoidea, Ophiuriudea), Mollusca (Scaphopoda).	AM, AS	
19	11746_ENV1_G	29-Sep-2021	05:18:00	90	CHEM	2x Jars, 4x Ziplock	Muddy sand. Munsell: 2.5YR 4/2 (dark grayish brown).		AM, AS	
20	11746_ENV1_G	29-Sep-2021	05:38:00	0	NS				AM, AS	Triggered in water column
21	11746_ENV1_G	29-Sep-2021	05:46:00	80	MFB	1x 1L pot	Muddy sand.	Annelida (Polychaeta), Arthropoda (Gnathiidae), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda).	AM, AS	
22	11746_ENV1_G	29-Sep-2021	05:59:00	80	MFC	1x 1L pot	Muddy sand.	Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Bivalvia, Scaphopoda).	AM, AS	

APPENDIX A FIELD SAMPLING LOGS

Gardline

Seafloor Imagery Positioning Summary

Job No	11745	Vessel	MV *Kommandor*					
Client	CNOOC International	Vessel Reference Point (VRP)	CoG					
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys	Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z 4.72
Primary Positioning System	CNav A 3050	Actual Coordinates derived from	Beacon					
Geodetic Reference System	Datum ED50	Ellipsoid International 1924 (Hayford 1910)	Projection UTM Zone 31N, CM 3°W	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-2021	09:30:13	1	11745_ENV6_C			Camera	114	642938	6414549	642939	6414555	-1	-6	6	186		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:30:57	2	11745_ENV6_C			Camera	114	642937	6414548	642939	6414555	-2	-7	7	193		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:31:52	3	11745_ENV6_C			Camera	114	642937	6414549	642939	6414555	-2	-6	6	202		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:33:21	4	11745_ENV6_C			Camera	114	642938	6414550	642939	6414555	-1	-5	5	192		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:34:08	5	11745_ENV6_C			Camera	114	642938	6414549	642939	6414555	-1	-6	6	191		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:35:08	6	11745_ENV6_C			Camera	114	642937	6414549	642939	6414555	-2	-6	6	198		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:36:23	7	11745_ENV6_C			Camera	114	642938	6414549	642939	6414555	-1	-6	6	189		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:38:02	8	11745_ENV6_C			Camera	114	642937	6414550	642939	6414555	-2	-5	5	198		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:38:19	9	11745_ENV6_C			Camera	114	642937	6414551	642939	6414555	-2	-4	5	210		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:39:11	10	11745_ENV6_C			Camera	114	642937	6414554	642939	6414555	-2	-1	3	242		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:40:03	11	11745_ENV6_C			Camera	114	642938	6414557	642939	6414555	-1	2	2	327		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:40:40	12	11745_ENV6_C			Camera	114	642938	6414559	642939	6414555	-1	4	4	349		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:41:08	13	11745_ENV6_C			Camera	114	642938	6414562	642939	6414555	-1	7	7	351		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:41:35	14	11745_ENV6_C			Camera	114	642938	6414561	642939	6414555	-1	6	7	349		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:41:57	15	11745_ENV6_C			Camera	114	642937	6414562	642939	6414555	-2	7	7	346		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:42:22	16	11745_ENV6_C			Camera	114	642937	6414564	642939	6414555	-2	9	9	345		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:43:07	17	11745_ENV6_C			Camera	114	642937	6414563	642939	6414555	-2	8	8	348		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:43:38	18	11745_ENV6_C			Camera	114	642936	6414563	642939	6414555	-3	8	9	339		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:44:44	19	11745_ENV6_C			Camera	114	642938	6414561	642939	6414555	-1	6	6	352		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:46:09	20	11745_ENV6_C			Camera	114	642941	6414559	642939	6414555	2	4	4	26		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:46:54	21	11745_ENV6_C			Camera	114	642942	6414557	642939	6414555	3	2	4	57		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:47:39	22	11745_ENV6_C			Camera	114	642944	6414556	642939	6414555	5	1	5	79		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:48:22	23	11745_ENV6_C			Camera	114	642947	6414555	642939	6414555	8	0	8	90		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:48:39	24	11745_ENV6_C			Camera	114	642948	6414555	642939	6414555	9	0	9	91		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:49:16	25	11745_ENV6_C			Camera	114	642948	6414554	642939	6414555	9	-1	9	98		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:49:47	26	11745_ENV6_C			Camera	114	642948	6414554	642939	6414555	9	-1	9	99		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:50:21	27	11745_ENV6_C			Camera	114	642948	6414551	642939	6414555	9	-4	10	116		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:51:04	28	11745_ENV6_C			Camera	114	642947	6414548	642939	6414555	8	-7	11	132		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:51:53	29	11745_ENV6_C			Camera	114	642946	6414545	642939	6414555	7	-10	12	143		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	09:53:08	30	11745_ENV6_C			Camera	114	642944	6414543	642939	6414555	5	-12	13	159		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:43:56	31	11745_ENV4_C			Camera	115	641343	6415985	641344	6416002	-1	-17	17	183		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:44:22	32	11745_ENV4_C			Camera	115	641343	6415985	641344	6416002	-1	-17	17	183		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:44:56	33	11745_ENV4_C			Camera	115	641343	6415987	641344	6416002	-1	-15	15	185		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:45:25	34	11745_ENV4_C			Camera	115	641342	6415988	641344	6416002	-2	-14	14	188		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:46:04	35	11745_ENV4_C			Camera	115	641343	6415987	641344	6416002	-1	-15	15	185		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:46:57	36	11745_ENV4_C			Camera	115	641342	6415990	641344	6416002	-2	-12	12	188		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:48:14	37	11745_ENV4_C			Camera	121	641341	6415992	641344	6416002	-3	-10	10	199		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:49:21	38	11745_ENV4_C			Camera	209	641341	6415995	641344	6416002	-3	-7	8	199		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:50:07	39	11745_ENV4_C			Camera	115	641342	6415996	641344	6416002	-2	-6	6	200		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:50:52	40	11745_ENV4_C			Camera	115	641343	6415995	641344	6416002	-1	-7	7	184		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:52:23	41	11745_ENV4_C			Camera	115	641346	6415993	641344	6416002	2	-9	9	165		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:53:03	42	11745_ENV4_C			Camera	115	641347	6415992	641344	6416002	3	-10	10	162		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:53:43	43	11745_ENV4_C			Camera	115	641349	6415989	641344	6416002	5	-13	13	160		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:57:13	44	11745_ENV4_C			Camera	115	641352	6415987	641344	6416002	8	-15	17	152		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:58:09	45	11745_ENV4_C			Camera	115	641352	6415991	641344	6416002	8	-11	14	145		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:58:51	46	11745_ENV4_C			Camera	115	641352	6415992	641344	6416002	8	-10	13	142		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	10:59:25	47	11745_ENV4_C			Camera	115	641352	6415994	641344	6416002	8	-9	12	136		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	11:00:10	48	11745_ENV4_C			Camera	115	641352	6415993	641344	6416002	8	-9	12	139		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	11:01:09	49	11745_ENV4_C			Camera	115	641352	6415994	641344	6416002	8	-8	12	137		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	11:02:25	50	11745_ENV4_C			Camera	115	641351	6415994	641344	6416002	7	-8	11	140		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	11:05:33	51	11745_ENV4_C			Camera	115	641351	6415998	641344	6416002	7	-4	8	122		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	11:05:57	52	11745_ENV4_C			Camera	115	641350	6415998	641344	6416002	6	-4	7	124		(Raw Nav, SeaSpyder) (B)

APPENDIX A FIELD SAMPLING LOGS

Seafloor Imagery Positioning Summary

Job No	11745			Vessel	MV *Kommandor*				
Client	CNOOC International			Vessel Reference Point (VRP)	CoG				
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys			Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39
						z	4.72		
Primary Positioning System	CNav A 3050			Actual Coordinates derived from	Beacon				
Geodetic Reference System	Datum	ED50	Ellipsoid	International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W	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-2021	11:06:33	53	11745_ENV4_C			Camera	115	641349	6415999	641344	6416002	5	-3	6	124		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	11:07:12	54	11745_ENV4_C			Camera	142	641346	6416000	641344	6416002	2	-2	3	140		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	11:07:55	55	11745_ENV4_C			Camera	115	641343	6416001	641344	6416002	-1	-1	1	242		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	11:08:44	56	11745_ENV4_C			Camera	115	641342	6416004	641344	6416002	-2	2	3	306		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	11:09:16	57	11745_ENV4_C			Camera	129	641341	6416005	641344	6416002	-3	3	4	319		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:01:31	58	11745_ENV5_C			Camera	110	639620	6414303	639619	6414323	1	-20	20	178		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:02:39	59	11745_ENV5_C			Camera	110	639622	6414306	639619	6414323	3	-18	18	171		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:03:18	60	11745_ENV5_C			Camera	110	639622	6414308	639619	6414323	3	-15	15	167		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:04:09	61	11745_ENV5_C			Camera	110	639622	6414310	639619	6414323	3	-13	13	168		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:04:47	62	11745_ENV5_C			Camera	110	639621	6414312	639619	6414323	2	-11	11	172		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:05:21	63	11745_ENV5_C			Camera	110	639620	6414313	639619	6414323	1	-10	10	172		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:06:02	64	11745_ENV5_C			Camera	110	639620	6414315	639619	6414323	1	-8	8	170		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:07:00	65	11745_ENV5_C			Camera	110	639620	6414319	639619	6414323	1	-4	4	164		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:08:23	66	11745_ENV5_C			Camera	110	639618	6414322	639619	6414323	-1	-1	1	217		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:09:05	67	11745_ENV5_C			Camera	110	639619	6414325	639619	6414323	0	2	2	347		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:09:32	68	11745_ENV5_C			Camera	110	639619	6414325	639619	6414323	0	2	2	11		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:10:51	69	11745_ENV5_C			Camera	110	639619	6414331	639619	6414323	0	8	8	2		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:11:02	70	11745_ENV5_C			Camera	110	639619	6414331	639619	6414323	0	8	8	3		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:11:53	71	11745_ENV5_C			Camera	110	639618	6414333	639619	6414323	-1	10	10	356		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:12:40	72	11745_ENV5_C			Camera	110	639617	6414334	639619	6414323	-2	11	11	350		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:16:03	73	11745_ENV5_C			Camera	111	639611	6414327	639619	6414323	-8	4	9	299		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:16:24	74	11745_ENV5_C			Camera	110	639611	6414327	639619	6414323	-8	4	8	295		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:16:46	75	11745_ENV5_C			Camera	110	639611	6414325	639619	6414323	-8	2	8	284		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:17:19	76	11745_ENV5_C			Camera	110	639611	6414323	639619	6414323	-8	0	8	272		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:18:19	77	11745_ENV5_C			Camera	111	639611	6414320	639619	6414323	-8	-3	8	252		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:19:19	78	11745_ENV5_C			Camera	110	639612	6414318	639619	6414323	-7	-5	9	235		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:19:52	79	11745_ENV5_C			Camera	110	639613	6414316	639619	6414323	-7	-7	9	224		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:22:15	80	11745_ENV5_C			Camera	190	639614	6414314	639619	6414323	-5	-9	10	209		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:23:16	81	11745_ENV5_C			Camera	110	639616	6414316	639619	6414323	-3	-7	8	203		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:23:47	82	11745_ENV5_C			Camera	110	639617	6414317	639619	6414323	-2	-6	6	197		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:24:30	83	11745_ENV5_C			Camera	110	639620	6414318	639619	6414323	1	-5	5	168		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	12:25:28	84	11745_ENV5_C			Camera	110	639622	6414321	639619	6414323	3	-2	4	127		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:23:58	85	11745_ENV3_C			Camera	115	641437	6418165	641434	6418176	3	-11	12	165		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:25:13	86	11745_ENV3_C			Camera	115	641436	6418168	641434	6418176	2	-8	8	169		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:25:54	87	11745_ENV3_C			Camera	115	641436	6418170	641434	6418176	2	-6	6	162		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:27:21	88	11745_ENV3_C			Camera	115	641435	6418174	641434	6418176	1	-2	3	162		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:27:52	89	11745_ENV3_C			Camera	115	641435	6418175	641434	6418176	1	-1	1	141		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:28:14	90	11745_ENV3_C			Camera	115	641435	6418176	641434	6418176	1	0	1	108		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:28:40	91	11745_ENV3_C			Camera	115	641435	6418178	641434	6418176	1	2	2	20		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:29:12	92	11745_ENV3_C			Camera	115	641434	6418181	641434	6418176	0	5	5	4		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:29:43	93	11745_ENV3_C			Camera	115	641434	6418182	641434	6418176	0	6	6	1		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:32:36	94	11745_ENV3_C			Camera	115	641438	6418184	641434	6418176	4	8	9	25		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:33:19	95	11745_ENV3_C			Camera	115	641440	6418184	641434	6418176	6	8	10	37		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:34:12	96	11745_ENV3_C			Camera	115	641441	6418181	641434	6418176	7	5	9	53		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:34:38	97	11745_ENV3_C			Camera	115	641442	6418180	641434	6418176	8	4	9	62		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:35:02	98	11745_ENV3_C			Camera	115	641443	6418180	641434	6418176	9	4	10	66		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:35:32	99	11745_ENV3_C			Camera	115	641444	6418179	641434	6418176	10	3	10	73		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:38:02	100	11745_ENV3_C			Camera	115	641446	6418175	641434	6418176	12	-1	12	94		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:38:38	101	11745_ENV3_C			Camera	115	641444	6418173	641434	6418176	10	-3	11	104		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:39:28	102	11745_ENV3_C			Camera	115	641442	6418173	641434	6418176	8	-3	9	111		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:39:54	103	11745_ENV3_C			Camera	115	641441	6418173	641434	6418176	7	-3	8	115		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:40:29	104	11745_ENV3_C			Camera	115	641440	6418171	641434	6418176	6	-5	8	132		(Raw Nav, SeaSpydder) (B)

APPENDIX A FIELD SAMPLING LOGS

Seafloor Imagery Positioning Summary

Job No	11745	Vessel	MV *Kommandor*
Client	CNOOC International	Vessel Reference Point (VRP)	CoG
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys	Deployment Location	ENV Deployment Point; x -8.64; y -5.39; z 4.72
Primary Positioning System	CNav A 3050	Actual Coordinates derived from	Beacon
Geodetic Reference System	Datum: ED50; Ellipsoid: International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W; 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-2021	13:40:45	105	11745_ENV3_C			Camera	115	641439	6418170	641434	6418176	5	-6	8	139		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:41:13	106	11745_ENV3_C			Camera	115	641438	6418169	641434	6418176	4	-7	8	150		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:41:26	107	11745_ENV3_C			Camera	115	641438	6418169	641434	6418176	4	-7	8	153		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:44:27	108	11745_ENV3_C			Camera	115	641433	6418168	641434	6418176	-1	-8	8	184		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	13:45:21	109	11745_ENV3_C			Camera	115	641430	6418170	641434	6418176	-4	-6	7	210		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:30:33	110	11745_ENV1_C			Camera	114	638669	6419238	638668	6419239	1	-1	2	152		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:32:09	111	11745_ENV1_C			Camera	114	638667	6419238	638668	6419239	-1	-1	1	230		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:32:37	112	11745_ENV1_C			Camera	114	638666	6419238	638668	6419239	-2	-1	2	243		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:33:08	113	11745_ENV1_C			Camera	114	638664	6419238	638668	6419239	-4	-1	4	253		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:34:17	114	11745_ENV1_C			Camera	114	638659	6419237	638668	6419239	-9	-2	9	255		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:35:11	115	11745_ENV1_C			Camera	114	638658	6419237	638668	6419239	-10	-2	11	257		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:36:10	116	11745_ENV1_C			Camera	111	638660	6419239	638668	6419239	-8	0	8	271		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:36:32	117	11745_ENV1_C			Camera	114	638661	6419241	638668	6419239	-7	2	7	283		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:37:35	118	11745_ENV1_C			Camera	114	638663	6419244	638668	6419239	-5	5	7	313		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:39:04	119	11745_ENV1_C			Camera	114	638666	6419246	638668	6419239	-2	7	7	343		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:40:02	120	11745_ENV1_C			Camera	114	638669	6419248	638668	6419239	1	9	10	4		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:40:45	121	11745_ENV1_C			Camera	114	638670	6419250	638668	6419239	2	11	11	8		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:42:18	122	11745_ENV1_C			Camera	114	638667	6419246	638668	6419239	-1	7	7	351		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:44:22	123	11745_ENV1_C			Camera	114	638663	6419243	638668	6419239	-5	4	6	305		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:45:28	124	11745_ENV1_C			Camera	114	638661	6419240	638668	6419239	-7	1	7	275		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:46:30	125	11745_ENV1_C			Camera	114	638661	6419238	638668	6419239	-7	-1	7	265		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:47:53	126	11745_ENV1_C			Camera	114	638665	6419234	638668	6419239	-3	-5	6	212		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:49:13	127	11745_ENV1_C			Camera	114	638668	6419232	638668	6419239	0	-7	7	179		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:50:45	128	11745_ENV1_C			Camera	114	638670	6419229	638668	6419239	2	-10	10	168		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:53:07	129	11745_ENV1_C			Camera	114	638676	6419228	638668	6419239	8	-11	13	143		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:54:19	130	11745_ENV1_C			Camera	114	638675	6419232	638668	6419239	7	-7	10	137		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:54:54	131	11745_ENV1_C			Camera	114	638675	6419233	638668	6419239	7	-6	9	131		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:55:28	132	11745_ENV1_C			Camera	114	638674	6419235	638668	6419239	6	-4	7	123		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:56:19	133	11745_ENV1_C			Camera	114	638674	6419238	638668	6419239	6	-1	6	102		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:56:57	134	11745_ENV1_C			Camera	114	638674	6419239	638668	6419239	6	0	6	88		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:58:03	135	11745_ENV1_C			Camera	114	638674	6419243	638668	6419239	6	4	7	58		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	14:58:47	136	11745_ENV1_C			Camera	114	638673	6419246	638668	6419239	5	7	8	37		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	15:58:11	137	11745_ENV2_C			Camera	110	641630	6420345	641627	6420342	3	3	4	39		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	15:58:53	138	11745_ENV2_C			Camera	110	641630	6420345	641627	6420342	3	3	4	43		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	15:59:35	139	11745_ENV2_C			Camera	110	641629	6420344	641627	6420342	2	2	3	50		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:00:24	140	11745_ENV2_C			Camera	110	641627	6420342	641627	6420342	0	0	0	315		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:01:40	141	11745_ENV2_C			Camera	110	641625	6420339	641627	6420342	-2	-3	4	216		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:02:15	142	11745_ENV2_C			Camera	110	641624	6420338	641627	6420342	-3	-4	5	210		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:02:51	143	11745_ENV2_C			Camera	110	641622	6420335	641627	6420342	-5	-7	8	217		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:03:19	144	11745_ENV2_C			Camera	110	641621	6420335	641627	6420342	-6	-7	9	219		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:04:52	145	11745_ENV2_C			Camera	110	641620	6420335	641627	6420342	-7	-7	10	222		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:06:22	146	11745_ENV2_C			Camera	110	641623	6420337	641627	6420342	-4	-5	7	214		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:06:53	147	11745_ENV2_C			Camera	110	641625	6420337	641627	6420342	-2	-5	5	200		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:07:45	148	11745_ENV2_C			Camera	110	641628	6420336	641627	6420342	1	-6	6	174		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:08:06	149	11745_ENV2_C			Camera	110	641629	6420336	641627	6420342	2	-6	6	159		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:09:19	150	11745_ENV2_C			Camera	110	641633	6420338	641627	6420342	6	-4	7	128		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:12:28	151	11745_ENV2_C			Camera	110	641635	6420342	641627	6420342	8	0	8	93		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:13:08	152	11745_ENV2_C			Camera	110	641635	6420344	641627	6420342	8	2	9	76		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:14:00	153	11745_ENV2_C			Camera	110	641634	6420346	641627	6420342	7	4	8	62		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:15:28	154	11745_ENV2_C			Camera	110	641634	6420351	641627	6420342	7	9	11	37		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:15:41	155	11745_ENV2_C			Camera	110	641634	6420352	641627	6420342	7	10	12	34		(Raw Nav, SeaSpydder) (B)
20-Sep-2021	16:17:40	156	11745_ENV2_C			Camera	110	641632	6420352	641627	6420342	5	10	12	27		(Raw Nav, SeaSpydder) (B)

APPENDIX A FIELD SAMPLING LOGS

Seafloor Imagery Positioning Summary

Job No	11745			Vessel	MV *Kommandor*				
Client	CNOOC International			Vessel Reference Point (VRP)	CoG				
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys			Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z	4.72
Primary Positioning System	CNav A 3050			Actual Coordinates derived from	Beacon				
Geodetic Reference System	Datum	ED50	Ellipsoid	International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W	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-2021	16:18:04	157	11745_ENV2_C			Camera	110	641631	6420352	641627	6420342	4	10	11	23		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	16:19:00	158	11745_ENV2_C			Camera	110	641628	6420352	641627	6420342	1	10	10	7		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	16:19:34	159	11745_ENV2_C			Camera	110	641625	6420352	641627	6420342	-2	10	10	349		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	16:19:54	160	11745_ENV2_C			Camera	110	641624	6420352	641627	6420342	-3	10	10	345		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	16:20:27	161	11745_ENV2_C			Camera	110	641624	6420352	641627	6420342	-3	10	11	342		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	16:59:00	162	11745_TR_ENV7			Camera	111	643068	6419976	643222	6420021	-154	-45	161	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	16:59:10	163	11745_TR_ENV7			Camera	111	643068	6419976	643222	6420021	-154	-45	160	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	16:59:25	164	11745_TR_ENV7			Camera	111	643067	6419977	643222	6420021	-155	-44	161	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:01:01	165	11745_TR_ENV7			Camera	111	643069	6419978	643222	6420021	-153	-43	159	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:01:22	166	11745_TR_ENV7			Camera	112	643070	6419979	643222	6420021	-152	-42	158	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:02:03	167	11745_TR_ENV7			Camera	111	643072	6419978	643222	6420021	-150	-43	156	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:02:11	168	11745_TR_ENV7			Camera	111	643073	6419978	643222	6420021	-149	-43	155	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:02:27	169	11745_TR_ENV7			Camera	111	643073	6419979	643222	6420021	-149	-43	154	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:02:40	170	11745_TR_ENV7			Camera	111	643074	6419979	643222	6420021	-148	-42	154	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:03:01	171	11745_TR_ENV7			Camera	111	643075	6419980	643222	6420021	-147	-41	153	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:03:12	172	11745_TR_ENV7			Camera	111	643075	6419981	643222	6420021	-147	-40	152	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:03:35	173	11745_TR_ENV7			Camera	111	643076	6419981	643222	6420021	-146	-40	151	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:03:40	174	11745_TR_ENV7			Camera	111	643077	6419981	643222	6420021	-145	-40	151	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:04:05	175	11745_TR_ENV7			Camera	111	643078	6419981	643222	6420021	-144	-40	149	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:04:38	176	11745_TR_ENV7			Camera	111	643080	6419982	643222	6420021	-142	-39	148	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:05:05	177	11745_TR_ENV7			Camera	111	643081	6419982	643222	6420021	-141	-39	147	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:05:33	178	11745_TR_ENV7			Camera	111	643082	6419982	643222	6420021	-140	-39	145	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:05:51	179	11745_TR_ENV7			Camera	111	643083	6419983	643222	6420021	-139	-38	144	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:06:10	180	11745_TR_ENV7			Camera	111	643084	6419983	643222	6420021	-138	-38	143	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:06:43	181	11745_TR_ENV7			Camera	111	643086	6419983	643222	6420021	-136	-38	141	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:07:26	182	11745_TR_ENV7			Camera	111	643088	6419984	643222	6420021	-134	-37	139	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:08:01	183	11745_TR_ENV7			Camera	111	643090	6419985	643222	6420021	-132	-36	137	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:08:27	184	11745_TR_ENV7			Camera	111	643090	6419986	643222	6420021	-132	-35	136	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:09:20	185	11745_TR_ENV7			Camera	111	643093	6419986	643222	6420021	-129	-35	134	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:10:04	186	11745_TR_ENV7			Camera	111	643096	6419986	643222	6420021	-126	-35	131	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:10:35	187	11745_TR_ENV7			Camera	111	643097	6419988	643222	6420021	-125	-33	129	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:12:14	188	11745_TR_ENV7			Camera	111	643102	6419988	643222	6420021	-120	-33	124	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:13:02	189	11745_TR_ENV7			Camera	111	643106	6419988	643222	6420021	-116	-33	120	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:13:02	189a	11745_TR_ENV7			Camera	111	643106	6419988	643222	6420021	-116	-33	120	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:15:05	190	11745_TR_ENV7			Camera	111	643111	6419990	643222	6420021	-111	-31	115	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:17:00	191	11745_TR_ENV7			Camera	111	643115	6419991	643222	6420021	-107	-30	111	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:18:20	192	11745_TR_ENV7			Camera	111	643120	6419994	643222	6420021	-102	-27	106	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:18:55	193	11745_TR_ENV7			Camera	111	643122	6419993	643222	6420021	-100	-28	104	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:21:12	194	11745_TR_ENV7			Camera	111	643130	6419994	643222	6420021	-92	-27	96	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:22:44	195	11745_TR_ENV7			Camera	111	643136	6419997	643222	6420021	-86	-24	89	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:23:26	196	11745_TR_ENV7			Camera	111	643136	6419996	643222	6420021	-86	-25	89	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:23:52	197	11745_TR_ENV7			Camera	111	643138	6419996	643222	6420021	-84	-25	88	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:24:52	198	11745_TR_ENV7			Camera	111	643140	6419997	643222	6420021	-82	-24	85	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:25:14	199	11745_TR_ENV7			Camera	111	643142	6419997	643222	6420021	-80	-24	83	253		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:25:54	200	11745_TR_ENV7			Camera	111	643144	6419998	643222	6420021	-78	-23	81	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:26:09	201	11745_TR_ENV7			Camera	111	643145	6419999	643222	6420021	-77	-22	80	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:26:24	202	11745_TR_ENV7			Camera	111	643146	6419999	643222	6420021	-76	-22	80	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:27:02	203	11745_TR_ENV7			Camera	111	643147	6419999	643222	6420021	-75	-22	78	253		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:27:17	204	11745_TR_ENV7			Camera	111	643149	6419998	643222	6420021	-73	-23	77	253		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:27:44	205	11745_TR_ENV7			Camera	111	643150	6419998	643222	6420021	-72	-23	76	252		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:28:10	206	11745_TR_ENV7			Camera	111	643151	6419998	643222	6420021	-71	-23	74	252		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:28:25	207	11745_TR_ENV7			Camera	111	643152	6419999	643222	6420021	-70	-22	73	252		(Raw Nav, SeaSpyder) (B)

APPENDIX A FIELD SAMPLING LOGS

Seafloor Imagery Positioning Summary

Job No	11745			Vessel	MV *Kommandor*				
Client	CNOOC International			Vessel Reference Point (VRP)	CoG				
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys			Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39
						z	4.72		
Primary Positioning System	CNav A 3050			Actual Coordinates derived from	Beacon				
Geodetic Reference System	Datum	ED50	Ellipsoid	International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W	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-2021	17:28:32	208	11745_TR_ENV7			Camera	111	643152	6419999	643222	6420021	-70	-22	73	252		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:28:39	209	11745_TR_ENV7			Camera	111	643153	6419999	643222	6420021	-69	-22	73	253		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:31:17	210	11745_TR_ENV7			Camera	111	643158	6420002	643222	6420021	-64	-19	67	253		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:32:00	211	11745_TR_ENV7			Camera	111	643160	6420003	643222	6420021	-62	-18	65	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:34:04	212	11745_TR_ENV7			Camera	111	643167	6420006	643222	6420021	-55	-15	57	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:34:49	213	11745_TR_ENV7			Camera	111	643170	6420007	643222	6420021	-52	-14	54	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:35:16	214	11745_TR_ENV7			Camera	111	643171	6420008	643222	6420021	-51	-13	53	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:35:22	215	11745_TR_ENV7			Camera	111	643171	6420008	643222	6420021	-51	-13	53	256		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:36:32	216	11745_TR_ENV7			Camera	111	643174	6420009	643222	6420021	-48	-12	49	256		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:38:05	217	11745_TR_ENV7			Camera	111	643179	6420010	643222	6420021	-43	-11	44	256		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:38:43	218	11745_TR_ENV7			Camera	111	643182	6420010	643222	6420021	-40	-11	42	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:39:59	219	11745_TR_ENV7			Camera	111	643186	6420012	643222	6420021	-36	-9	37	256		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:41:09	220	11745_TR_ENV7			Camera	111	643189	6420012	643222	6420021	-33	-9	34	255		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:42:22	221	11745_TR_ENV7			Camera	111	643193	6420014	643222	6420021	-29	-7	30	256		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:43:29	222	11745_TR_ENV7			Camera	111	643196	6420015	643222	6420021	-26	-6	27	256		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:43:51	223	11745_TR_ENV7			Camera	111	643196	6420015	643222	6420021	-26	-6	26	256		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:44:43	224	11745_TR_ENV7			Camera	111	643200	6420013	643222	6420021	-22	-8	24	250		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:44:43	224a	11745_TR_ENV7			Camera	111	643200	6420013	643222	6420021	-22	-8	24	250		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:45:15	225	11745_TR_ENV7			Camera	111	643201	6420017	643222	6420021	-21	-4	21	259		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:46:03	226	11745_TR_ENV7			Camera	111	643203	6420018	643222	6420021	-19	-3	19	260		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:46:51	227	11745_TR_ENV7			Camera	111	643205	6420018	643222	6420021	-17	-3	17	259		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:47:11	228	11745_TR_ENV7			Camera	111	643206	6420018	643222	6420021	-16	-3	16	260		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:47:27	229	11745_TR_ENV7			Camera	111	643207	6420019	643222	6420021	-15	-2	16	261		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:47:27	229a	11745_TR_ENV7			Camera	111	643207	6420019	643222	6420021	-15	-2	16	261		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:48:32	230	11745_TR_ENV7			Camera	111	643209	6420020	643222	6420021	-13	-1	13	267		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:48:53	231	11745_TR_ENV7			Camera	111	643210	6420021	643222	6420021	-12	0	12	270		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:49:29	232	11745_TR_ENV7			Camera	111	643212	6420021	643222	6420021	-10	0	10	271		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:50:55	233	11745_TR_ENV7			Camera	111	643216	6420021	643222	6420021	-6	0	6	272		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:51:11	234	11745_TR_ENV7			Camera	111	643217	6420021	643222	6420021	-5	0	5	273		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:51:19	235	11745_TR_ENV7			Camera	111	643217	6420021	643222	6420021	-5	0	5	273		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:51:27	236	11745_TR_ENV7			Camera	111	643217	6420022	643222	6420021	-5	1	5	277		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:51:37	237	11745_TR_ENV7			Camera	111	643218	6420021	643222	6420021	-4	0	4	273		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:51:37	237a	11745_TR_ENV7			Camera	111	643218	6420021	643222	6420021	-4	0	4	273		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:52:10	238	11745_TR_ENV7			Camera	111	643219	6420022	643222	6420021	-3	1	3	290		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:52:30	239	11745_TR_ENV7			Camera	111	643220	6420022	643222	6420021	-2	1	2	302		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:53:19	240	11745_TR_ENV7			Camera	111	643223	6420023	643222	6420021	1	2	2	25		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:53:42	241	11745_TR_ENV7			Camera	111	643224	6420022	643222	6420021	2	1	2	63		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:54:45	242	11745_TR_ENV7			Camera	111	643227	6420022	643222	6420021	5	1	6	81		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:55:02	243	11745_TR_ENV7			Camera	110	643228	6420022	643222	6420021	6	1	6	81		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:55:18	244	11745_TR_ENV7			Camera	111	643228	6420023	643222	6420021	6	2	6	75		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	17:55:34	245	11745_TR_ENV7			Camera	111	643229	6420023	643222	6420021	7	2	8	73		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:07:27	246	11745_TR_ENV9			Camera	112	643855	6422350	643850	6422359	5	-9	10	149		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:08:48	247	11745_TR_ENV9			Camera	112	643854	6422351	643850	6422359	4	-8	9	154		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:10:08	248	11745_TR_ENV9			Camera	112	643851	6422354	643850	6422359	1	-5	5	167		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:10:23	249	11745_TR_ENV9			Camera	112	643850	6422355	643850	6422359	0	-4	4	174		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:10:57	250	11745_TR_ENV9			Camera	112	643849	6422356	643850	6422359	-1	-3	3	201		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:11:16	251	11745_TR_ENV9			Camera	112	643848	6422357	643850	6422359	-2	-2	3	230		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:11:21	252	11745_TR_ENV9			Camera	112	643848	6422357	643850	6422359	-2	-2	3	228		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:11:29	253	11745_TR_ENV9			Camera	112	643848	6422357	643850	6422359	-2	-2	3	235		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:12:39	254	11745_TR_ENV9			Camera	112	643845	6422358	643850	6422359	-5	-1	5	254		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:13:58	255	11745_TR_ENV9			Camera	112	643842	6422360	643850	6422359	-8	1	8	280		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:16:04	256	11745_TR_ENV9			Camera	112	643837	6422365	643850	6422359	-13	6	14	293		(Raw Nav, SeaSpyder) (B)

APPENDIX A FIELD SAMPLING LOGS

Gardline

Seafloor Imagery Positioning Summary

Job No	11745			Vessel	MV *Kommandor*						
Client	CNOOC International			Vessel Reference Point (VRP)	CoG						
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys			Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z	4.72
Primary Positioning System	CNav A 3050			Actual Coordinates derived from	Beacon						
Geodetic Reference System	Datum	ED50	Ellipsoid: International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W		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-2021	19:16:32	257	11745_TR_ENV9			Camera	112	643835	6422366	643850	6422359	-15	7	16	296		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:17:04	258	11745_TR_ENV9			Camera	112	643834	6422368	643850	6422359	-16	9	18	298		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:17:46	259	11745_TR_ENV9			Camera	112	643832	6422370	643850	6422359	-18	11	21	301		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:18:11	260	11745_TR_ENV9			Camera	112	643832	6422371	643850	6422359	-18	12	21	303		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:18:26	261	11745_TR_ENV9			Camera	112	643832	6422371	643850	6422359	-18	12	21	304		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:18:57	262	11745_TR_ENV9			Camera	112	643831	6422371	643850	6422359	-19	12	23	303		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:20:04	263	11745_TR_ENV9			Camera	112	643828	6422374	643850	6422359	-22	15	27	305		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:21:04	264	11745_TR_ENV9			Camera	112	643826	6422376	643850	6422359	-24	17	30	306		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:21:39	265	11745_TR_ENV9			Camera	112	643825	6422377	643850	6422359	-25	18	31	306		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:22:44	266	11745_TR_ENV9			Camera	112	643823	6422379	643850	6422359	-27	20	34	307		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:22:44	266a	11745_TR_ENV9			Camera	112	643823	6422379	643850	6422359	-27	20	34	307		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:24:37	267	11745_TR_ENV9			Camera	112	643825	6422383	643850	6422359	-25	24	35	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:25:16	268	11745_TR_ENV9			Camera	112	643823	6422384	643850	6422359	-27	25	37	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:26:59	269	11745_TR_ENV9			Camera	112	643819	6422388	643850	6422359	-31	29	42	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:27:17	270	11745_TR_ENV9			Camera	112	643819	6422388	643850	6422359	-31	29	43	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:28:27	271	11745_TR_ENV9			Camera	112	643816	6422391	643850	6422359	-34	32	47	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:29:48	272	11745_TR_ENV9			Camera	112	643813	6422393	643850	6422359	-37	34	50	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:30:40	273	11745_TR_ENV9			Camera	112	643811	6422395	643850	6422359	-39	36	53	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:30:40	273a	11745_TR_ENV9			Camera	112	643811	6422395	643850	6422359	-39	36	53	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:31:21	274	11745_TR_ENV9			Camera	112	643809	6422396	643850	6422359	-41	37	55	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:32:43	275	11745_TR_ENV9			Camera	112	643807	6422400	643850	6422359	-43	41	59	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:33:04	276	11745_TR_ENV9			Camera	112	643806	6422400	643850	6422359	-44	41	60	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:33:55	277	11745_TR_ENV9			Camera	112	643804	6422401	643850	6422359	-47	42	63	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:35:06	278	11745_TR_ENV9			Camera	112	643801	6422403	643850	6422359	-49	44	66	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:36:20	279	11745_TR_ENV9			Camera	112	643797	6422406	643850	6422359	-53	47	71	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:36:33	280	11745_TR_ENV9			Camera	112	643797	6422407	643850	6422359	-53	48	71	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:37:12	281	11745_TR_ENV9			Camera	112	643796	6422408	643850	6422359	-54	49	73	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:37:30	282	11745_TR_ENV9			Camera	112	643795	6422408	643850	6422359	-55	49	74	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:39:31	283	11745_TR_ENV9			Camera	112	643791	6422414	643850	6422359	-59	55	80	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:40:56	284	11745_TR_ENV9			Camera	112	643788	6422414	643850	6422359	-62	55	83	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:42:03	285	11745_TR_ENV9			Camera	112	643785	6422418	643850	6422359	-65	59	88	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:42:44	286	11745_TR_ENV9			Camera	112	643784	6422420	643850	6422359	-66	61	90	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:43:36	287	11745_TR_ENV9			Camera	112	643781	6422422	643850	6422359	-69	63	94	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:45:07	288	11745_TR_ENV9			Camera	112	643778	6422424	643850	6422359	-72	65	97	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:45:52	289	11745_TR_ENV9			Camera	112	643777	6422427	643850	6422359	-73	68	100	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:47:09	290	11745_TR_ENV9			Camera	112	643774	6422428	643850	6422359	-76	69	103	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:48:50	291	11745_TR_ENV9			Camera	112	643770	6422432	643850	6422359	-80	73	109	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:49:30	292	11745_TR_ENV9			Camera	112	643769	6422434	643850	6422359	-81	75	111	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:50:31	293	11745_TR_ENV9			Camera	112	643766	6422436	643850	6422359	-84	77	114	312		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:52:19	294	11745_TR_ENV9			Camera	112	643762	6422440	643850	6422359	-88	81	120	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:52:51	295	11745_TR_ENV9			Camera	112	643762	6422441	643850	6422359	-88	82	121	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:53:57	296	11745_TR_ENV9			Camera	112	643759	6422443	643850	6422359	-91	84	124	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:54:40	297	11745_TR_ENV9			Camera	112	643757	6422446	643850	6422359	-93	87	127	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:55:13	298	11745_TR_ENV9			Camera	112	643757	6422446	643850	6422359	-93	87	127	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:56:31	299	11745_TR_ENV9			Camera	112	643753	6422448	643850	6422359	-97	89	132	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:58:30	300	11745_TR_ENV9			Camera	109	643749	6422452	643850	6422359	-101	93	137	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	19:59:14	301	11745_TR_ENV9			Camera	112	643747	6422455	643850	6422359	-103	96	141	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	20:00:29	302	11745_TR_ENV9			Camera	112	643745	6422457	643850	6422359	-105	98	144	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	20:01:46	303	11745_TR_ENV9			Camera	112	643741	6422459	643850	6422359	-109	100	148	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	20:02:03	304	11745_TR_ENV9			Camera	112	643741	6422460	643850	6422359	-109	101	148	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	20:02:34	305	11745_TR_ENV9			Camera	112	643740	6422461	643850	6422359	-110	102	150	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	20:02:55	306	11745_TR_ENV9			Camera	112	643739	6422462	643850	6422359	-111	103	151	313		(Raw Nav, SeaSpyder) (B)

APPENDIX A FIELD SAMPLING LOGS

Gardline Seafloor Imagery Positioning Summary

Job No	11745		Vessel	MV *Kommandor*					
Client	CNOOC International		Vessel Reference Point (VRP)	CoG					
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys		Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z 4.72
Primary Positioning System	CNav A 3050		Actual Coordinates derived from	Beacon					
Geodetic Reference System	Datum: ED50	Ellipsoid: International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W		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-2021	20:03:15	307	11745_TR_ENV9			Camera	112	643738	6422462	643850	6422359	-112	103	152	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	20:04:26	308	11745_TR_ENV9			Camera	112	643736	6422466	643850	6422359	-114	107	156	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	20:05:16	309	11745_TR_ENV9			Camera	112	643734	6422467	643850	6422359	-116	108	159	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	20:05:43	310	11745_TR_ENV9			Camera	112	643733	6422468	643850	6422359	-117	109	160	313		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:21:35	311	11745_TR_ENV8			Camera	111	641408	6421837	641405	6421838	3	-1	3	106		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:22:36	312	11745_TR_ENV8			Camera	111	641408	6421840	641405	6421838	3	2	3	55		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:23:10	313	11745_TR_ENV8			Camera	111	641408	6421840	641405	6421838	3	2	3	58		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:24:28	314	11745_TR_ENV8			Camera	111	641408	6421837	641405	6421838	3	-1	3	117		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:24:48	315	11745_TR_ENV8			Camera	111	641407	6421835	641405	6421838	2	-3	3	137		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:25:33	316	11745_TR_ENV8			Camera	111	641407	6421833	641405	6421838	2	-5	5	160		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:26:46	317	11745_TR_ENV8			Camera	111	641407	6421830	641405	6421838	2	-8	9	165		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:26:46	317a	11745_TR_ENV8			Camera	111	641407	6421830	641405	6421838	2	-8	9	165		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:27:23	318	11745_TR_ENV8			Camera	111	641406	6421827	641405	6421838	1	-11	11	173		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:28:19	319	11745_TR_ENV8			Camera	111	641405	6421824	641405	6421838	0	-14	14	178		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:28:56	320	11745_TR_ENV8			Camera	111	641406	6421823	641405	6421838	1	-15	15	177		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:30:05	321	11745_TR_ENV8			Camera	111	641406	6421820	641405	6421838	1	-18	18	177		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:30:48	322	11745_TR_ENV8			Camera	111	641404	6421817	641405	6421838	-1	-21	21	182		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:32:03	323	11745_TR_ENV8			Camera	111	641405	6421812	641405	6421838	0	-26	26	180		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:32:40	324	11745_TR_ENV8			Camera	111	641403	6421811	641405	6421838	-2	-27	27	183		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:33:42	325	11745_TR_ENV8			Camera	111	641401	6421809	641405	6421838	-4	-29	30	187		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:34:39	326	11745_TR_ENV8			Camera	111	641399	6421808	641405	6421838	-6	-30	30	191		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:35:55	327	11745_TR_ENV8			Camera	111	641398	6421807	641405	6421838	-7	-31	32	192		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:36:42	328	11745_TR_ENV8			Camera	111	641398	6421804	641405	6421838	-7	-34	35	191		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:37:43	329	11745_TR_ENV8			Camera	111	641398	6421801	641405	6421838	-7	-37	38	191		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:39:09	330	11745_TR_ENV8			Camera	111	641397	6421797	641405	6421838	-8	-41	42	191		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:40:25	331	11745_TR_ENV8			Camera	111	641397	6421792	641405	6421838	-8	-46	46	190		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:41:06	332	11745_TR_ENV8			Camera	111	641396	6421790	641405	6421838	-9	-48	49	190		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:42:25	333	11745_TR_ENV8			Camera	111	641395	6421785	641405	6421838	-10	-53	53	191		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:43:16	334	11745_TR_ENV8			Camera	111	641395	6421783	641405	6421838	-10	-55	56	190		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:44:57	335	11745_TR_ENV8			Camera	111	641393	6421776	641405	6421838	-12	-62	63	191		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:45:33	336	11745_TR_ENV8			Camera	111	641392	6421775	641405	6421838	-13	-63	64	192		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:46:15	337	11745_TR_ENV8			Camera	111	641392	6421774	641405	6421838	-13	-64	65	191		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:47:11	338	11745_TR_ENV8			Camera	111	641392	6421772	641405	6421838	-13	-66	67	191		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:47:59	339	11745_TR_ENV8			Camera	111	641391	6421769	641405	6421838	-14	-69	70	191		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:48:27	340	11745_TR_ENV8			Camera	111	641391	6421768	641405	6421838	-14	-70	72	192		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:49:02	341	11745_TR_ENV8			Camera	111	641389	6421766	641405	6421838	-16	-72	73	192		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:49:28	342	11745_TR_ENV8			Camera	111	641388	6421765	641405	6421838	-17	-73	75	193		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:50:22	343	11745_TR_ENV8			Camera	111	641387	6421762	641405	6421838	-18	-76	78	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:50:47	344	11745_TR_ENV8			Camera	111	641387	6421761	641405	6421838	-18	-77	79	193		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:51:22	345	11745_TR_ENV8			Camera	111	641386	6421760	641405	6421838	-19	-78	80	193		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:52:18	346	11745_TR_ENV8			Camera	110	641385	6421757	641405	6421838	-20	-81	84	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:52:23	347	11745_TR_ENV8			Camera	110	641385	6421757	641405	6421838	-21	-81	84	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:53:13	348	11745_TR_ENV8			Camera	111	641383	6421755	641405	6421838	-22	-83	86	195		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:53:42	349	11745_TR_ENV8			Camera	111	641383	6421754	641405	6421838	-22	-84	87	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:54:32	350	11745_TR_ENV8			Camera	111	641383	6421750	641405	6421838	-22	-88	91	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:55:02	351	11745_TR_ENV8			Camera	110	641382	6421748	641405	6421838	-23	-90	93	195		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:55:44	352	11745_TR_ENV8			Camera	110	641381	6421746	641405	6421838	-24	-92	95	195		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:56:29	353	11745_TR_ENV8			Camera	110	641381	6421744	641405	6421838	-24	-94	97	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:56:56	354	11745_TR_ENV8			Camera	111	641381	6421743	641405	6421838	-24	-95	99	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:58:44	355	11745_TR_ENV8			Camera	111	641378	6421737	641405	6421838	-27	-101	105	195		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	21:59:41	356	11745_TR_ENV8			Camera	111	641379	6421734	641405	6421838	-26	-104	107	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:01:21	357	11745_TR_ENV8			Camera	111	641377	6421728	641405	6421838	-28	-110	114	194		(Raw Nav, SeaSpyder) (B)

APPENDIX A FIELD SAMPLING LOGS

Gardline — Seafloor Imagery Positioning Summary

Job No	11745			Vessel	MV *Kommandor*					
Client	CNOOC International			Vessel Reference Point (VRP)	CoG					
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys			Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z 4.72
Primary Positioning System	CNav A 3050			Actual Coordinates derived from	Beacon					
Geodetic Reference System	Datum	ED50	Ellipsoid International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W		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-2021	22:03:32	358	11745_TR_ENV8			Camera	111	641378	6421723	641405	6421838	-27	-115	119	193		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:04:19	359	11745_TR_ENV8			Camera	111	641377	6421719	641405	6421838	-28	-119	122	193		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:06:04	360	11745_TR_ENV8			Camera	111	641374	6421713	641405	6421838	-31	-125	129	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:07:04	361	11745_TR_ENV8			Camera	111	641373	6421710	641405	6421838	-32	-128	132	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:08:10	362	11745_TR_ENV8			Camera	111	641371	6421707	641405	6421838	-34	-131	136	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:08:31	363	11745_TR_ENV8			Camera	111	641371	6421706	641405	6421838	-34	-132	136	195		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:09:25	364	11745_TR_ENV8			Camera	111	641371	6421704	641405	6421838	-34	-134	139	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:09:25	364a	11745_TR_ENV8			Camera	111	641371	6421704	641405	6421838	-34	-134	139	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:10:42	365	11745_TR_ENV8			Camera	111	641371	6421700	641405	6421838	-34	-138	142	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:11:06	366	11745_TR_ENV8			Camera	111	641370	6421698	641405	6421838	-35	-140	144	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:11:32	367	11745_TR_ENV8			Camera	111	641369	6421698	641405	6421838	-36	-140	145	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:11:57	368	11745_TR_ENV8			Camera	111	641369	6421697	641405	6421838	-36	-141	146	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:11:57	368a	11745_TR_ENV8			Camera	111	641369	6421697	641405	6421838	-36	-141	146	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:12:42	369	11745_TR_ENV8			Camera	111	641368	6421695	641405	6421838	-37	-144	148	194		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:13:24	370	11745_TR_ENV8			Camera	111	641367	6421692	641405	6421838	-38	-146	151	195		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:14:12	371	11745_TR_ENV8			Camera	112	641365	6421689	641405	6421838	-40	-149	154	195		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:14:39	372	11745_TR_ENV8			Camera	111	641364	6421686	641405	6421838	-41	-152	157	195		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:15:07	373	11745_TR_ENV8			Camera	111	641364	6421686	641405	6421838	-41	-152	158	195		(Raw Nav, SeaSpyder) (B)
20-Sep-2021	22:16:07	374	11745_TR_ENV8			Camera	111	641364	6421683	641405	6421838	-41	-155	160	195		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:10:31	406	11745_ENV18_C			Camera	115	637533	6411914	637534	6411918	-1	-4	4	200		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:11:42	407	11745_ENV18_C			Camera	115	637533	6411915	637534	6411918	-1	-3	3	198		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:12:04	408	11745_ENV18_C			Camera	115	637533	6411915	637534	6411918	-1	-3	3	203		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:13:19	409	11745_ENV18_C			Camera	115	637535	6411916	637534	6411918	1	-2	2	167		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:15:45	410	11745_ENV18_C			Camera	115	637543	6411916	637534	6411918	9	-2	9	105		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:16:22	411	11745_ENV18_C			Camera	115	637542	6411915	637534	6411918	8	-3	9	108		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:17:46	412	11745_ENV18_C			Camera	115	637541	6411915	637534	6411918	7	-3	8	113		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:17:50	413	11745_ENV18_C			Camera	115	637541	6411915	637534	6411918	7	-3	8	111		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:19:28	414	11745_ENV18_C			Camera	115	637538	6411917	637534	6411918	4	-1	4	98		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:20:07	415	11745_ENV18_C			Camera	115	637535	6411919	637534	6411918	1	1	2	59		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:20:34	416	11745_ENV18_C			Camera	115	637534	6411920	637534	6411918	0	2	2	5		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:21:31	417	11745_ENV18_C			Camera	115	637533	6411923	637534	6411918	-1	5	6	346		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:22:30	418	11745_ENV18_C			Camera	115	637531	6411924	637534	6411918	-3	6	7	335		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:23:35	419	11745_ENV18_C			Camera	114	637529	6411923	637534	6411918	-5	5	7	316		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:24:14	420	11745_ENV18_C			Camera	115	637527	6411921	637534	6411918	-7	3	7	295		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:25:19	421	11745_ENV18_C			Camera	115	637525	6411919	637534	6411918	-9	1	9	274		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:25:50	422	11745_ENV18_C			Camera	115	637525	6411918	637534	6411918	-9	0	9	267		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:26:25	423	11745_ENV18_C			Camera	115	637524	6411917	637534	6411918	-10	-1	10	263		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:26:50	424	11745_ENV18_C			Camera	115	637525	6411917	637534	6411918	-9	-1	9	261		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:28:27	425	11745_ENV18_C			Camera	115	637529	6411914	637534	6411918	-5	-4	7	231		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:29:00	426	11745_ENV18_C			Camera	115	637530	6411913	637534	6411918	-4	-5	7	215		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:29:34	427	11745_ENV18_C			Camera	115	637531	6411910	637534	6411918	-3	-8	8	200		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:30:49	428	11745_ENV18_C			Camera	115	637533	6411908	637534	6411918	-1	-10	10	185		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:31:16	429	11745_ENV18_C			Camera	115	637534	6411907	637534	6411918	0	-11	11	179		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:32:21	430	11745_ENV18_C			Camera	115	637537	6411906	637534	6411918	3	-12	13	165		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	23:33:02	431	11745_ENV18_C			Camera	115	637537	6411906	637534	6411918	3	-12	12	165		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:31:49	432	11745_ENV15_C			Camera	111	638103	6414437	638101	6414447	2	-10	10	166		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:33:01	433	11745_ENV15_C			Camera	111	638103	6414439	638101	6414447	2	-8	8	165		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:33:45	434	11745_ENV15_C			Camera	111	638104	6414440	638101	6414447	3	-7	7	159		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:34:05	435	11745_ENV15_C			Camera	111	638103	6414441	638101	6414447	2	-6	6	160		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:34:39	436	11745_ENV15_C			Camera	111	638103	6414443	638101	6414447	2	-4	5	152		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:34:48	437	11745_ENV15_C			Camera	111	638103	6414443	638101	6414447	2	-4	4	148		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:35:25	438	11745_ENV15_C			Camera	111	638103	6414445	638101	6414447	2	-2	2	132		(Raw Nav, SeaSpyder) (B)

Gardline

APPENDIX A FIELD SAMPLING LOGS

Gardline

Seafloor Imagery Positioning Summary

Job No	11745			Vessel	MV *Kommandor*						
Client	CNOOC International			Vessel Reference Point (VRP)	CoG						
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys			Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z	4.72
Primary Positioning System	CNav A 3050			Actual Coordinates derived from	Beacon						
Geodetic Reference System	Datum	ED50	Ellipsoid	International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W		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-2021	00:35:39	439	11745_ENV15_C			Camera	111	638103	6414446	638101	6414447	2	-1	2	120		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:36:16	440	11745_ENV15_C			Camera	111	638103	6414448	638101	6414447	2	1	2	61		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:36:24	441	11745_ENV15_C			Camera	111	638103	6414448	638101	6414447	2	1	2	57		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:36:49	442	11745_ENV15_C			Camera	111	638102	6414450	638101	6414447	1	3	3	24		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:36:51	443	11745_ENV15_C			Camera	111	638103	6414450	638101	6414447	2	3	4	27		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:37:00	444	11745_ENV15_C			Camera	111	638102	6414450	638101	6414447	1	3	3	16		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:38:09	445	11745_ENV15_C			Camera	111	638103	6414453	638101	6414447	2	6	6	16		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:38:12	446	11745_ENV15_C			Camera	111	638102	6414452	638101	6414447	1	5	6	14		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:38:47	447	11745_ENV15_C			Camera	111	638102	6414455	638101	6414447	1	8	8	11		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:38:54	448	11745_ENV15_C			Camera	111	638103	6414455	638101	6414447	2	8	8	13		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:39:00	449	11745_ENV15_C			Camera	111	638103	6414456	638101	6414447	2	9	9	11		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:39:07	450	11745_ENV15_C			Camera	111	638103	6414456	638101	6414447	2	9	9	11		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:39:10	451	11745_ENV15_C			Camera	111	638102	6414456	638101	6414447	1	9	9	7		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:39:10	451a	11745_ENV15_C			Camera	111	638102	6414456	638101	6414447	1	9	9	7		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:39:10	451b	11745_ENV15_C			Camera	111	638102	6414456	638101	6414447	1	9	9	7		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:40:17	452	11745_ENV15_C			Camera	111	638104	6414459	638101	6414447	3	12	12	12		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:42:04	453	11745_ENV15_C			Camera	111	638099	6414456	638101	6414447	-2	9	9	345		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:42:23	454	11745_ENV15_C			Camera	111	638098	6414455	638101	6414447	-3	8	9	341		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:42:23	454a	11745_ENV15_C			Camera	111	638098	6414455	638101	6414447	-3	8	9	341		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:44:09	455	11745_ENV15_C			Camera	111	638096	6414451	638101	6414447	-5	4	6	306		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:44:55	456	11745_ENV15_C			Camera	111	638094	6414449	638101	6414447	-7	2	8	287		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:45:36	457	11745_ENV15_C			Camera	111	638093	6414448	638101	6414447	-8	1	8	276		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:49:51	458	11745_ENV15_C			Camera	111	638098	6414442	638101	6414447	-3	-5	6	211		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:50:32	459	11745_ENV15_C			Camera	111	638100	6414441	638101	6414447	-1	-6	6	185		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	00:50:50	460	11745_ENV15_C			Camera	111	638101	6414440	638101	6414447	0	-7	7	177		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:09:11	461	11745_ENV12_C			Camera	112	643957	6416302	643958	6416312	-1	-10	10	185		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:10:49	462	11745_ENV12_C			Camera	116	643956	6416304	643958	6416312	-1	-8	8	190		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:10:58	463	11745_ENV12_C			Camera	116	643957	6416304	643958	6416312	-1	-8	8	188		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:11:47	464	11745_ENV12_C			Camera	116	643957	6416307	643958	6416312	-1	-5	5	191		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:13:27	465	11745_ENV12_C			Camera	116	643958	6416311	643958	6416312	0	-1	1	176		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:13:41	466	11745_ENV12_C			Camera	116	643958	6416313	643958	6416312	0	0	0	10		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:13:52	467	11745_ENV12_C			Camera	116	643958	6416314	643958	6416312	0	2	2	12		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:15:36	468	11745_ENV12_C			Camera	116	643958	6416317	643958	6416312	0	5	5	3		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:16:42	469	11745_ENV12_C			Camera	116	643956	6416322	643958	6416312	-1	9	10	352		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:17:13	470	11745_ENV12_C			Camera	116	643956	6416322	643958	6416312	-2	10	10	348		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:22:56	471	11745_ENV12_C			Camera	116	643947	6416313	643958	6416312	-11	1	11	276		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:24:11	472	11745_ENV12_C			Camera	116	643948	6416311	643958	6416312	-10	-1	10	263		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:25:05	473	11745_ENV12_C			Camera	116	643951	6416309	643958	6416312	-7	-3	7	247		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:25:46	474	11745_ENV12_C			Camera	116	643953	6416308	643958	6416312	-4	-4	6	224		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:27:16	475	11745_ENV12_C			Camera	116	643958	6416305	643958	6416312	1	-8	8	175		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:27:21	476	11745_ENV12_C			Camera	116	643958	6416304	643958	6416312	1	-8	8	175		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:30:19	477	11745_ENV12_C			Camera	115	643966	6416301	643958	6416312	8	-11	14	144		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:31:29	478	11745_ENV12_C			Camera	116	643964	6416303	643958	6416312	7	-9	11	144		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:31:29	478a	11745_ENV12_C			Camera	116	643964	6416303	643958	6416312	7	-9	11	144		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:32:37	479	11745_ENV12_C			Camera	116	643963	6416305	643958	6416312	5	-7	9	147		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	02:33:29	480	11745_ENV12_C			Camera	116	643961	6416307	643958	6416312	4	-5	7	147		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	03:54:47	481	11745_TR_ENV13			Camera	114	643656	6419199	643647	6419199	9	0	9	88		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	03:56:08	482	11745_TR_ENV13			Camera	114	643651	6419199	643647	6419199	4	0	4	88		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	03:58:56	483	11745_TR_ENV13			Camera	114	643643	6419199	643647	6419199	-4	0	4	272		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	04:00:02	484	11745_TR_ENV13			Camera	114	643639	6419199	643647	6419199	-8	0	8	267		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	04:00:48	485	11745_TR_ENV13			Camera	114	643637	6419199	643647	6419199	-10	0	10	269		(Raw Nav, SeaSpyder) (B)
26-Sep-2021	04:02:09	486	11745_TR_ENV13			Camera	114	643634	6419199	643647	6419199	-13	0	13	268		(Raw Nav, SeaSpyder) (B)

APPENDIX A FIELD SAMPLING LOGS

Seafloor Imagery Positioning Summary

Job No	11745			Vessel	MV *Kommandor*				
Client	CNOOC International			Vessel Reference Point (VRP)	CoG				
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys			Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z	4.72
Primary Positioning System	CNav A 3050			Actual Coordinates derived from	Beacon				
Geodetic Reference System	Datum	ED50	Ellipsoid	International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W	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-2021	04:03:57	487	11745_TR_ENV13			Camera	114	643628	6419200	643647	6419199	-19	1	19	272		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:05:37	488	11745_TR_ENV13			Camera	114	643622	6419200	643647	6419199	-25	1	25	272		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:07:29	489	11745_TR_ENV13			Camera	114	643617	6419199	643647	6419199	-30	0	30	269		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:12:32	490	11745_TR_ENV13			Camera	114	643602	6419200	643647	6419199	-45	1	45	271		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:12:54	491	11745_TR_ENV13			Camera	114	643601	6419200	643647	6419199	-46	1	46	271		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:13:03	492	11745_TR_ENV13			Camera	114	643600	6419200	643647	6419199	-47	1	47	272		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:13:59	493	11745_TR_ENV13			Camera	114	643597	6419200	643647	6419199	-50	1	50	271		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:15:10	494	11745_TR_ENV13			Camera	114	643594	6419199	643647	6419199	-53	0	53	270		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:15:53	495	11745_TR_ENV13			Camera	114	643592	6419199	643647	6419199	-55	0	55	270		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:20:06	496	11745_TR_ENV13			Camera	114	643580	6419199	643647	6419199	-67	0	67	270		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:21:25	497	11745_TR_ENV13			Camera	114	643576	6419197	643647	6419199	-71	-2	71	268		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:21:49	498	11745_TR_ENV13			Camera	114	643574	6419197	643647	6419199	-73	-2	73	268		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:21:53	499	11745_TR_ENV13			Camera	114	643574	6419197	643647	6419199	-73	-2	73	268		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:24:09	500	11745_TR_ENV13			Camera	113	643566	6419197	643647	6419199	-81	-2	81	269		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:26:56	501	11745_TR_ENV13			Camera	113	643558	6419196	643647	6419199	-89	-3	89	268		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:29:28	502	11745_TR_ENV13			Camera	113	643551	6419196	643647	6419199	-96	-3	96	268		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:30:15	503	11745_TR_ENV13			Camera	113	643547	6419196	643647	6419199	-100	-3	100	268		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:31:35	504	11745_TR_ENV13			Camera	113	643545	6419197	643647	6419199	-102	-2	102	269		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:32:43	505	11745_TR_ENV13			Camera	113	643541	6419197	643647	6419199	-106	-2	106	269		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	04:33:21	506	11745_TR_ENV13			Camera	113	643538	6419196	643647	6419199	-109	-3	109	269		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:34:23	507	11745_ENV10_C			Camera	114	641269	6417247	641267	6417235	2	12	12	9		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:37:29	508	11745_ENV10_C			Camera	114	641272	6417243	641267	6417235	5	8	9	32		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:37:43	509	11745_ENV10_C			Camera	114	641273	6417242	641267	6417235	6	7	9	38		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:38:52	510	11745_ENV10_C			Camera	114	641277	6417239	641267	6417235	10	5	11	65		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:39:49	511	11745_ENV10_C			Camera	114	641278	6417238	641267	6417235	11	3	11	73		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:40:13	512	11745_ENV10_C			Camera	114	641278	6417237	641267	6417235	11	2	11	81		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:40:54	513	11745_ENV10_C			Camera	114	641275	6417234	641267	6417235	8	0	8	92		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:45:10	514	11745_ENV10_C			Camera	114	641269	6417227	641267	6417235	2	-8	8	165		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:46:23	515	11745_ENV10_C			Camera	114	641265	6417229	641267	6417235	-2	-6	6	200		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:47:43	516	11745_ENV10_C			Camera	114	641262	6417227	641267	6417235	-5	-8	10	211		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:51:20	517	11745_ENV10_C			Camera	114	641263	6417231	641267	6417235	-4	-4	5	228		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:54:30	518	11745_ENV10_C			Camera	114	641263	6417240	641267	6417235	-4	6	7	324		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:56:50	519	11745_ENV10_C			Camera	114	641261	6417243	641267	6417235	-6	9	10	325		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:57:46	520	11745_ENV10_C			Camera	114	641263	6417242	641267	6417235	-4	7	8	332		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:58:42	521	11745_ENV10_C			Camera	114	641267	6417239	641267	6417235	0	4	4	3		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	09:59:33	522	11745_ENV10_C			Camera	114	641268	6417237	641267	6417235	1	3	3	27		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	10:00:25	523	11745_ENV10_C			Camera	114	641269	6417235	641267	6417235	2	0	2	96		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	10:52:37	524	11745_ENV11_C			Camera	114	639142	6416551	639142	6416548	0	2	2	352		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	10:54:42	525	11745_ENV11_C			Camera	114	639142	6416550	639142	6416548	-1	2	2	337		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	10:55:05	526	11745_ENV11_C			Camera	113	639142	6416549	639142	6416548	0	1	1	344		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	10:55:58	527	11745_ENV11_C			Camera	113	639142	6416546	639142	6416548	-1	-3	3	195		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	10:56:21	528	11745_ENV11_C			Camera	113	639141	6416544	639142	6416548	-1	-5	5	191		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	10:58:40	529	11745_ENV11_C			Camera	113	639143	6416540	639142	6416548	1	-9	9	174		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	10:59:44	530	11745_ENV11_C			Camera	113	639143	6416537	639142	6416548	1	-11	11	176		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:00:44	531	11745_ENV11_C			Camera	113	639141	6416538	639142	6416548	-1	-10	10	187		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:02:49	532	11745_ENV11_C			Camera	113	639142	6416540	639142	6416548	0	-8	8	180		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:03:37	533	11745_ENV11_C			Camera	113	639146	6416542	639142	6416548	3	-6	7	153		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:05:16	534	11745_ENV11_C			Camera	113	639150	6416547	639142	6416548	8	-1	8	100		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:05:46	535	11745_ENV11_C			Camera	113	639151	6416549	639142	6416548	9	0	9	89		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:06:18	536	11745_ENV11_C			Camera	110	639152	6416550	639142	6416548	9	1	10	82		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:07:26	537	11745_ENV11_C			Camera	113	639153	6416551	639142	6416548	10	3	11	76		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:10:03	538	11745_ENV11_C			Camera	114	639146	6416555	639142	6416548	4	6	8	32		(Raw Nav, SeaSpydder) (B)

Gardline

APPENDIX A FIELD SAMPLING LOGS

Gardline

Seafloor Imagery Positioning Summary

Job No	11745		Vessel	MV *Kommandor*				
Client	CNOOC International		Vessel Reference Point (VRP)	CoG				
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys		Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z	4.72
Primary Positioning System	CNav A 3050		Actual Coordinates derived from	Beacon				
Geodetic Reference System	Datum	ED50	Ellipsoid	International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W	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-2021	11:10:32	539	11745_ENV11_C			Camera	114	639147	6416556	639142	6416548	5	8	9	31		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:12:17	540	11745_ENV11_C			Camera	114	639145	6416555	639142	6416548	2	7	7	19		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:12:56	541	11745_ENV11_C			Camera	114	639145	6416554	639142	6416548	3	5	6	27		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:13:43	542	11745_ENV11_C			Camera	114	639145	6416552	639142	6416548	3	4	5	35		(Raw Nav, SeaSpydder) (B)
26-Sep-2021	11:16:36	543	11745_ENV11_C			Camera	109	639145	6416553	639142	6416548	2	5	5	27		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:18:46	548	11745_ENV14_C			Camera	118	635222	6413364	635226	6413364	-4	0	4	276		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:19:28	549	11745_ENV14_C			Camera	118	635223	6413366	635226	6413364	-3	2	4	298		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:20:28	550	11745_ENV14_C			Camera	118	635221	6413363	635226	6413364	-5	-1	5	262		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:21:47	551	11745_ENV14_C			Camera	118	635223	6413358	635226	6413364	-3	-6	7	206		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:22:44	552	11745_ENV14_C			Camera	118	635222	6413355	635226	6413364	-4	-9	10	205		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:23:34	553	11745_ENV14_C			Camera	118	635224	6413353	635226	6413364	-2	-11	11	190		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:24:02	554	11745_ENV14_C			Camera	118	635224	6413352	635226	6413364	-2	-12	12	189		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:24:56	555	11745_ENV14_C			Camera	118	635225	6413353	635226	6413364	-1	-11	11	187		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:25:09	556	11745_ENV14_C			Camera	118	635225	6413354	635226	6413364	-1	-10	10	186		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:26:34	557	11745_ENV14_C			Camera	118	635227	6413357	635226	6413364	1	-7	7	173		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:27:35	558	11745_ENV14_C			Camera	118	635228	6413361	635226	6413364	2	-3	3	153		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:28:32	559	11745_ENV14_C			Camera	118	635230	6413364	635226	6413364	4	0	4	90		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:30:03	560	11745_ENV14_C			Camera	118	635231	6413366	635226	6413364	5	2	5	71		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:31:55	561	11745_ENV14_C			Camera	118	635225	6413366	635226	6413364	-1	2	3	338		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:33:35	562	11745_ENV14_C			Camera	118	635220	6413369	635226	6413364	-6	5	8	310		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:35:54	563	11745_ENV14_C			Camera	118	635219	6413371	635226	6413364	-7	7	10	315		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:38:15	564	11745_ENV14_C			Camera	118	635220	6413369	635226	6413364	-6	5	8	308		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:38:37	565	11745_ENV14_C			Camera	118	635220	6413368	635226	6413364	-6	4	7	306		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:38:54	566	11745_ENV14_C			Camera	118	635220	6413367	635226	6413364	-6	3	7	301		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	09:40:38	567	11745_ENV14_C			Camera	118	635220	6413360	635226	6413364	-6	-4	7	235		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:29:47	568	11745_ENV16_C			Camera	115	635319	6414564	635323	6414567	-4	-3	5	232		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:29:51	569	11745_ENV16_C			Camera	115	635319	6414564	635323	6414567	-4	-3	5	231		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:30:34	570	11745_ENV16_C			Camera	115	635319	6414564	635323	6414567	-4	-3	5	231		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:30:59	571	11745_ENV16_C			Camera	115	635319	6414565	635323	6414567	-4	-2	5	242		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:31:16	572	11745_ENV16_C			Camera	115	635319	6414566	635323	6414567	-4	-1	4	252		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:32:23	573	11745_ENV16_C			Camera	115	635318	6414568	635323	6414567	-5	1	5	279		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:33:02	574	11745_ENV16_C			Camera	116	635319	6414570	635323	6414567	-4	3	6	306		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:34:10	575	11745_ENV16_C			Camera	115	635321	6414576	635323	6414567	-2	9	9	345		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:34:38	576	11745_ENV16_C			Camera	115	635322	6414578	635323	6414567	-1	11	11	353		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:36:54	577	11745_ENV16_C			Camera	115	635322	6414574	635323	6414567	-1	7	7	352		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:38:33	578	11745_ENV16_C			Camera	115	635325	6414572	635323	6414567	2	5	5	21		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:41:27	579	11745_ENV16_C			Camera	115	635331	6414566	635323	6414567	8	-1	8	100		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:41:56	580	11745_ENV16_C			Camera	115	635334	6414567	635323	6414567	11	0	11	92		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:42:21	581	11745_ENV16_C			Camera	115	635335	6414568	635323	6414567	12	1	12	86		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:42:21	581a	11745_ENV16_C			Camera	115	635335	6414568	635323	6414567	12	1	12	86		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:44:32	582	11745_ENV16_C			Camera	115	635330	6414562	635323	6414567	7	-5	8	126		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:45:47	583	11745_ENV16_C			Camera	115	635327	6414560	635323	6414567	4	-7	9	151		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:47:27	584	11745_ENV16_C			Camera	115	635325	6414556	635323	6414567	2	-11	11	171		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:48:19	585	11745_ENV16_C			Camera	115	635322	6414553	635323	6414567	-1	-14	14	183		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:48:51	586	11745_ENV16_C			Camera	115	635323	6414553	635323	6414567	0	-14	14	179		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:52:47	587	11745_ENV16_C			Camera	115	635322	6414563	635323	6414567	-1	-4	4	193		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	10:52:47	587a	11745_ENV16_C			Camera	115	635322	6414563	635323	6414567	-1	-4	4	193		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	12:06:02	588	11745_ENV17_C			Camera	98	630601	6412042	630597	6412044	4	-1	4	110		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	12:07:32	589	11745_ENV17_C			Camera	98	630600	6412039	630597	6412044	3	-5	5	146		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	12:07:48	590	11745_ENV17_C			Camera	98	630599	6412039	630597	6412044	2	-5	5	160		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	12:08:31	591	11745_ENV17_C			Camera	98	630599	6412036	630597	6412044	2	-8	8	166		(Raw Nav, SeaSpydder) (B)
29-Sep-2021	12:09:01	592	11745_ENV17_C			Camera	98	630600	6412033	630597	6412044	4	-11	11	160		(Raw Nav, SeaSpydder) (B)

APPENDIX A FIELD SAMPLING LOGS

Seafloor Imagery Positioning Summary

Job No	11745	Vessel	MV *Kommandor*
Client	CNOOC International	Vessel Reference Point (VRP)	CoG
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys	Deployment Location	ENV Deployment Point; x -8.64; y -5.39; z 4.72
Primary Positioning System	CNav A 3050	Actual Coordinates derived from	Beacon
Geodetic Reference System	Datum: ED50; Ellipsoid: International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W; 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		
29-Sep-2021	12:11:35	593	11745_ENV17_C			Camera	98	630594	6412034	630597	6412044	-2	-10	10	194		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:12:04	594	11745_ENV17_C			Camera	98	630592	6412034	630597	6412044	-5	-10	11	207		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:12:18	595	11745_ENV17_C			Camera	98	630591	6412034	630597	6412044	-6	-10	11	209		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:12:34	596	11745_ENV17_C			Camera	98	630591	6412033	630597	6412044	-6	-10	12	211		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:13:45	597	11745_ENV17_C			Camera	98	630590	6412037	630597	6412044	-7	-7	10	226		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:15:11	598	11745_ENV17_C			Camera	98	630591	6412039	630597	6412044	-5	-4	7	229		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:15:26	599	11745_ENV17_C			Camera	98	630592	6412040	630597	6412044	-5	-4	6	229		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:15:59	600	11745_ENV17_C			Camera	98	630593	6412042	630597	6412044	-4	-2	4	241		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:16:39	601	11745_ENV17_C			Camera	98	630594	6412042	630597	6412044	-3	-2	3	239		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:17:16	602	11745_ENV17_C			Camera	98	630597	6412044	630597	6412044	0	0	0	125		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:17:47	603	11745_ENV17_C			Camera	98	630598	6412047	630597	6412044	1	3	3	17		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:18:17	604	11745_ENV17_C			Camera	98	630598	6412049	630597	6412044	1	6	6	14		(Raw Nav, SeaSpyder) (B)
29-Sep-2021	12:18:17	604a	11745_ENV17_C			Camera	98	630598	6412049	630597	6412044	1	6	6	14		(Raw Nav, SeaSpyder) (B)

APPENDIX A FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

Job No	11745		Vessel	MV *Kommandor*					
Client	CNOOC Petroleum Europe Limited		Vessel Reference Point (VRP)	CoG					
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys		Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z 4.72
Primary Positioning System	CNAV 5000		Actual Coordinates derived fron	Deployment Location / Beacon (delete as appropriate)					
Geodetic Reference System	Datum ED50	Ellipsoid International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W		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-2021	23:34:00	375	11745_ENV2_G	<40	NS	Grab	112	641626	6420346	641627	6420342	-1	4	4	351	SS	
20-Sep-2021	23:47:00	376	11745_ENV2_G	0	NS	Grab	112	641626	6420343	641627	6420342	-1	1	2	330	SS	
20-Sep-2021	23:56:00	377	11745_ENV2_G	0	NS	Grab	112	641625	6420344	641627	6420342	-2	2	3	326	SS	
21-Sep-2021	00:16:39	378	11745_ENV2_G	30	NS	Grab	112	641625	6420339	641627	6420342	-2	-3	4	209	SS	
21-Sep-2021	00:35:07	379	11745_ENV2_G	50	MFA	Grab	112	641632	6420340	641627	6420342	5	-2	5	115	SS	
21-Sep-2021	00:49:49	380	11745_ENV2_G	<40	NS	Grab	111	641632	6420339	641627	6420342	5	-3	6	117	SS	
21-Sep-2021	01:07:33	381	11745_ENV2_G	50	CHEM	Grab	111	641632	6420338	641627	6420342	5	-4	6	131	SS	
21-Sep-2021	01:33:25	382	11745_ENV2_G	50	MFB	Grab	111	641633	6420340	641627	6420342	6	-2	7	112	SS	
21-Sep-2021	01:48:19	383	11745_ENV2_G	50	MFC	Grab	111	641634	6420339	641627	6420342	7	-3	7	117	SS	
21-Sep-2021	02:47:31	384	11745_ENV1_G	40	MFA	Grab	114	638667	6419241	638668	6419239	-1	2	2	323	SS	
21-Sep-2021	03:01:28	385	11745_ENV1_G	40	CHEM	Grab	114	638668	6419239	638668	6419239	0	0	1	58	SS	
21-Sep-2021	03:26:05	386	11745_ENV1_G	50	MFB	Grab	114	638669	6419238	638668	6419239	1	-1	1	132	SS	
21-Sep-2021	03:39:13	387	11745_ENV1_G	30	NS	Grab	114	638669	6419239	638668	6419239	1	0	1	86	SS	
21-Sep-2021	03:52:11	388	11745_ENV1_G	40	MFC	Grab	113	638669	6419239	638668	6419239	1	0	2	72	SS	
21-Sep-2021	05:04:54	389	11745_ENV3_G	90	MFA	Grab	113	641435	6418175	641434	6418176	1	-1	1	120	SS	
21-Sep-2021	05:18:34	390	11745_ENV3_G	80	CHEM	Grab	113	641435	6418175	641434	6418176	1	-1	1	158	SS	
21-Sep-2021	05:40:43	391	11745_ENV3_G	70	MFB	Grab	113	641435	6418177	641434	6418176	1	1	2	48	SS	
21-Sep-2021	05:53:14	392	11745_ENV3_G	0.6	MFC	Grab	113	641437	6418177	641434	6418176	3	1	3	63	SS	
21-Sep-2021	06:49:21	393	11745_ENV4_G	90	MFA	Grab	113	641345	6416003	641344	6416002	1	1	1	53	SS	
21-Sep-2021	07:03:15	394	11745_ENV4_G	50	CHEM	Grab	113	641345	6416003	641344	6416002	1	1	2	51	SS	
21-Sep-2021	07:28:47	395	11745_ENV4_G	70	MFB	Grab	113	641345	6416003	641344	6416002	1	1	1	44	SS	
21-Sep-2021	07:41:00	396	11745_ENV4_G	60	MFC	Grab	114	641346	6416002	641344	6416002	2	0	2	81	SS	
21-Sep-2021	08:36:48	397	11745_ENV6_G	60	MFA	Grab	113	642941	6414554	642939	6414555	2	-1	2	107	SS	
21-Sep-2021	08:54:37	398	11745_ENV6_G	60	CHEM	Grab	113	642940	6414556	642939	6414555	1	1	1	35	SS	
21-Sep-2021	09:22:12	399	11745_ENV6_G	80	MFB	Grab	114	642940	6414555	642939	6414555	1	0	1	76	SS	
21-Sep-2021	09:34:53	400	11745_ENV6_G	60	NS	Grab	114	642939	6414556	642939	6414555	0	1	1	6	SS	
21-Sep-2021	09:51:52	401	11745_ENV6_G	0.8	MFC	Grab	114	642938	6414557	642939	6414555	-1	2	2	343	SS	
21-Sep-2021	10:40:00	402	11745_ENV5_G	70	MFA	Grab	111	639619	6414324	639619	6414323	0	1	1	339	AW	
21-Sep-2021	10:55:00	403	11745_ENV5_G	60	CHEM	Grab	111	639618	6414323	639619	6414323	-1	0	1	275	AW	
21-Sep-2021	11:18:00	404	11745_ENV5_G	50	MFB	Grab	111	639618	6414323	639619	6414323	-1	0	1	269	AW	
21-Sep-2021	11:29:00	405	11745_ENV5_G	50	MFC	Grab	111	639619	6414324	639619	6414323	0	1	1	20	AW	
29-Sep-2021	07:19:33	544	11745_ENV18_G	60	MFA	Grab	115.26	637531	6411917	637534	6411918	-3	-1	3	241	SS	
29-Sep-2021	07:32:58	545	11745_ENV18_G	60	CHEM	Grab	115.24	637533	6411917	637534	6411918	-1	-1	2	233	SS	
29-Sep-2021	07:53:37	546	11745_ENV18_G	70	MFB	Grab	115.18	637531	6411915	637534	6411918	-3	-3	4	233	SS	
29-Sep-2021	08:06:11	547	11745_ENV18_G	80	MFC	Grab	115.14	637530	6411915	637534	6411918	-4	-3	5	233	SS	
29-Sep-2021	12:51:00	605	11745_ENV17_G	40	MFB	Grab	97.62	630596	6412040	630597	6412044	-1	-4	4	197	AW	

APPENDIX A FIELD SAMPLING LOGS

Seafloor Sampling Positioning Summary

Job No	11745	Vessel	MV *Kommandor*						
Client	CNOOC Petroleum Europe Limited	Vessel Reference Point (VRP)	CoG						
Project Name	Ettrick Debris Clearance and Green Volt Environmental Surveys	Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z	4.72
Primary Positioning System	CNAV 5000	Actual Coordinates derived fron	Deployment Location / Beacon (delete as appropriate)						
Geodetic Reference System	Datum	ED50	Ellipsoid	International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W	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		
29-Sep-2021	13:00:00	606	11745_ENV17_G	40	MFC	Grab	97.64	630595	6412044	630597	6412044	-2	0	2	284	AW	
29-Sep-2021	13:11:00	607	11745_ENV17_G	50	CHEM	Grab	97.79	630600	6412048	630597	6412044	3	4	5	40	AW	
29-Sep-2021	13:23:00	608	11745_ENV17_G	0	NS	Grab	97.77	630598	6412045	630597	6412044	1	1	2	33	AW	
29-Sep-2021	13:33:00	609	11745_ENV17_G	50	MFA	Grab	97.73	630598	6412044	630597	6412044	1	0	1	80	AW	
29-Sep-2021	14:29:00	610	11745_ENV16_G	0	NS	Grab	115.45	635321	6414560	635323	6414567	-2	-7	7	194	AW	
29-Sep-2021	14:40:00	611	11745_ENV16_G	40	MFC	Grab	115.58	635319	6414567	635323	6414567	-4	0	4	270	AW	
29-Sep-2021	14:50:00	612	11745_ENV16_G	0	NS	Grab	115.55	635318	6414564	635323	6414567	-5	-3	6	244	AW	
29-Sep-2021	15:00:00	613	11745_ENV16_G	40	CHEM	Grab	115.53	635323	6414564	635323	6414567	0	-3	3	174	AW	
29-Sep-2021	15:12:00	614	11745_ENV16_G	40	MFA	Grab	115.65	635323	6414568	635323	6414567	0	1	1	15	AW	
29-Sep-2021	15:21:00	615	11745_ENV16_G	50	MFB	Grab	115.78	635326	6414567	635323	6414567	3	0	3	83	AW	
29-Sep-2021	16:15:00	616	11745_ENV14_G	50	CHEM	Grab	118.37	635226	6413361	635226	6413364	0	-3	3	184	AW	
29-Sep-2021	16:30:00	617	11745_ENV14_G	40	MFC	Grab	118.36	635222	6413361	635226	6413364	-4	-3	5	237	AW	
29-Sep-2021	16:40:00	618	11745_ENV14_G	50	MFA	Grab	118.41	635222	6413361	635226	6413364	-4	-3	5	236	AW	
29-Sep-2021	16:49:00	619	11745_ENV14_G	40	MFB	Grab	118.50	635225	6413365	635226	6413364	-1	1	2	306	AW	

APPENDIX A FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Imagery Summary

Job No	11746			Vessel	MV *Kommandor*				
Client	CNOOC International			Vessel Reference Point (VRP)	CoG				
Project Name	Green Volt Export Cable Route			Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39
						z	4.72		
Primary Positioning System	CNav A 3050			Actual Coordinates derived from	Beacon				
Geodetic Reference System	Datum	ED50	Ellipsoid	International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W	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		
25-Sep-2021	13:55:31	1	11746_ENV5_C			Camera	95	600603	6388669	600603	6388686	0	-17	17	181		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	13:56:48	2	11746_ENV5_C			Camera	95	600603	6388669	600603	6388686	0	-17	17	181		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	13:57:45	3	11746_ENV5_C			Camera	95	600602	6388672	600603	6388686	-1	-14	14	185		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	13:58:14	4	11746_ENV5_C			Camera	95	600602	6388674	600603	6388686	-1	-12	12	184		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	13:59:34	5	11746_ENV5_C			Camera	95	600602	6388678	600603	6388686	-1	-8	8	188		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:00:14	6	11746_ENV5_C			Camera	95	600601	6388681	600603	6388686	-2	-5	5	196		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:00:50	7	11746_ENV5_C			Camera	95	600601	6388682	600603	6388686	-2	-4	5	205		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:01:37	8	11746_ENV5_C			Camera	95	600601	6388684	600603	6388686	-2	-2	3	230		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:02:21	9	11746_ENV5_C			Camera	95	600600	6388686	600603	6388686	-3	0	3	263		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:03:02	10	11746_ENV5_C			Camera	95	600601	6388688	600603	6388686	-2	2	3	304		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:04:20	11	11746_ENV5_C			Camera	95	600601	6388691	600603	6388686	-2	5	6	337		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:05:22	12	11746_ENV5_C			Camera	95	600602	6388694	600603	6388686	-1	8	8	356		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:06:48	13	11746_ENV5_C			Camera	95	600605	6388695	600603	6388686	2	9	10	13		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:07:14	14	11746_ENV5_C			Camera	95	600606	6388697	600603	6388686	3	11	11	15		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:08:00	15	11746_ENV5_C			Camera	95	600606	6388698	600603	6388686	3	12	12	16		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:08:48	16	11746_ENV5_C			Camera	95	600607	6388697	600603	6388686	4	11	12	21		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:10:49	17	11746_ENV5_C			Camera	95	600608	6388694	600603	6388686	5	8	9	29		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:11:35	18	11746_ENV5_C			Camera	95	600608	6388691	600603	6388686	5	5	7	43		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:12:09	19	11746_ENV5_C			Camera	95	600608	6388690	600603	6388686	5	4	6	53		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:12:58	20	11746_ENV5_C			Camera	95	600609	6388687	600603	6388686	6	1	6	78		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:14:11	21	11746_ENV5_C			Camera	95	600609	6388684	600603	6388686	6	-2	7	110		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:14:11	21a	11746_ENV5_C			Camera	95	600609	6388684	600603	6388686	6	-2	7	110		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	14:14:48	22	11746_ENV5_C			Camera	95	600609	6388681	600603	6388686	6	-5	8	131		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:45:27	23	11746_ENV4_C			Camera	83	611326	6393998	611323	6394005	3	-7	8	156		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:47:32	24	11746_ENV4_C			Camera	83	611326	6394000	611323	6394005	3	-5	5	152		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:48:34	25	11746_ENV4_C			Camera	83	611324	6394003	611323	6394005	1	-2	2	154		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:49:10	26	11746_ENV4_C			Camera	83	611323	6394003	611323	6394005	0	-2	2	186		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:49:52	27	11746_ENV4_C			Camera	83	611321	6394003	611323	6394005	-2	-2	3	227		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:50:30	28	11746_ENV4_C			Camera	83	611320	6394005	611323	6394005	-3	0	3	263		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:52:19	29	11746_ENV4_C			Camera	83	611318	6394009	611323	6394005	-5	4	6	305		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:53:45	30	11746_ENV4_C			Camera	83	611321	6394011	611323	6394005	-2	6	6	339		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:54:29	31	11746_ENV4_C			Camera	83	611323	6394012	611323	6394005	0	7	7	358		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:55:45	32	11746_ENV4_C			Camera	83	611324	6394014	611323	6394005	1	9	9	8		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:56:49	33	11746_ENV4_C			Camera	83	611323	6394015	611323	6394005	0	10	10	3		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:57:38	34	11746_ENV4_C			Camera	83	611323	6394015	611323	6394005	0	10	10	1		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:57:38	34a	11746_ENV4_C			Camera	83	611323	6394015	611323	6394005	0	10	10	1		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	15:59:23	35	11746_ENV4_C			Camera	83	611327	6394011	611323	6394005	4	6	7	36		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	16:00:38	36	11746_ENV4_C			Camera	83	611332	6394010	611323	6394005	9	5	10	63		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	16:00:54	37	11746_ENV4_C			Camera	84	611332	6394009	611323	6394005	9	4	10	66		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	16:01:23	38	11746_ENV4_C			Camera	83	611332	6394009	611323	6394005	9	4	10	67		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:35:56	39	11746_ENV3_C			Camera	98	620236	6398571	620234	6398569	2	2	3	45		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:36:11	40	11746_ENV3_C			Camera	98	620235	6398570	620234	6398569	1	1	2	46		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:36:11	40a	11746_ENV3_C			Camera	98	620235	6398570	620234	6398569	1	1	2	46		(Raw Nav, SeaSpyder) (B)

APPENDIX A FIELD SAMPLING LOGS

Seafloor Sampling Imagery Summary

Job No	11746			Vessel	MV *Kommandor*						
Client	CNOOC International			Vessel Reference Point (VRP)	CoG						
Project Name	Green Volt Export Cable Route			Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z	4.72
Primary Positioning System	CNav A 3050			Actual Coordinates derived from	Beacon						
Geodetic Reference System	Datum	ED50	Ellipsoid	International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W		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		
25-Sep-2021	17:38:08	41	11746_ENV3_C			Camera	98	620231	6398566	620234	6398569	-3	-3	5	224		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:38:34	42	11746_ENV3_C			Camera	98	620229	6398565	620234	6398569	-5	-4	6	230		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:39:12	43	11746_ENV3_C			Camera	98	620227	6398563	620234	6398569	-7	-6	9	226		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:39:55	44	11746_ENV3_C			Camera	98	620227	6398563	620234	6398569	-7	-6	9	228		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:40:22	45	11746_ENV3_C			Camera	98	620227	6398563	620234	6398569	-7	-6	9	229		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:41:15	46	11746_ENV3_C			Camera	98	620228	6398563	620234	6398569	-6	-6	9	227		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:41:38	47	11746_ENV3_C			Camera	98	620228	6398563	620234	6398569	-6	-6	8	226		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:42:15	48	11746_ENV3_C			Camera	98	620231	6398564	620234	6398569	-3	-5	6	213		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:42:52	49	11746_ENV3_C			Camera	98	620233	6398564	620234	6398569	-1	-5	5	191		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:43:33	50	11746_ENV3_C			Camera	98	620235	6398564	620234	6398569	1	-5	5	173		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:43:48	51	11746_ENV3_C			Camera	98	620235	6398564	620234	6398569	1	-5	5	165		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:44:26	52	11746_ENV3_C			Camera	98	620237	6398565	620234	6398569	3	-4	5	139		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:45:05	53	11746_ENV3_C			Camera	98	620239	6398566	620234	6398569	5	-3	6	123		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:46:26	54	11746_ENV3_C			Camera	98	620238	6398566	620234	6398569	4	-3	5	120		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:46:51	55	11746_ENV3_C			Camera	98	620237	6398567	620234	6398569	3	-2	4	123		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:47:19	56	11746_ENV3_C			Camera	98	620236	6398568	620234	6398569	2	-1	2	121		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:47:44	57	11746_ENV3_C			Camera	98	620235	6398569	620234	6398569	1	0	1	127		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:48:14	58	11746_ENV3_C			Camera	98	620233	6398571	620234	6398569	-1	2	2	336		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:48:59	59	11746_ENV3_C			Camera	98	620230	6398573	620234	6398569	-4	4	5	313		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:49:35	60	11746_ENV3_C			Camera	98	620229	6398573	620234	6398569	-5	4	7	306		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:50:12	61	11746_ENV3_C			Camera	98	620227	6398574	620234	6398569	-7	5	9	304		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:50:12	61a	11746_ENV3_C			Camera	98	620227	6398574	620234	6398569	-7	5	9	304		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	17:51:20	62	11746_ENV3_C			Camera	98	620225	6398575	620234	6398569	-9	6	11	304		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:37:26	63	11746_ENV2_C			Camera	110	626495	6402477	626493	6402465	2	12	12	8		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:38:50	64	11746_ENV2_C			Camera	110	626497	6402475	626493	6402465	4	10	11	23		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:39:30	65	11746_ENV2_C			Camera	110	626497	6402473	626493	6402465	4	8	9	27		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:39:49	66	11746_ENV2_C			Camera	110	626497	6402471	626493	6402465	4	6	7	37		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:40:05	67	11746_ENV2_C			Camera	110	626497	6402470	626493	6402465	4	5	7	39		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:40:32	68	11746_ENV2_C			Camera	110	626497	6402468	626493	6402465	4	3	5	56		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:40:50	69	11746_ENV2_C			Camera	110	626497	6402467	626493	6402465	4	2	5	70		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:41:39	70	11746_ENV2_C			Camera	110	626497	6402464	626493	6402465	4	-1	4	97		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:42:16	71	11746_ENV2_C			Camera	110	626497	6402462	626493	6402465	4	-3	5	122		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:42:40	72	11746_ENV2_C			Camera	110	626498	6402461	626493	6402465	5	-4	6	127		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:43:14	73	11746_ENV2_C			Camera	110	626498	6402461	626493	6402465	5	-4	7	127		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:44:26	74	11746_ENV2_C			Camera	110	626500	6402457	626493	6402465	7	-8	11	137		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:44:41	75	11746_ENV2_C			Camera	110	626501	6402456	626493	6402465	8	-9	12	137		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:45:14	76	11746_ENV2_C			Camera	110	626501	6402455	626493	6402465	8	-10	13	142		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:46:00	77	11746_ENV2_C			Camera	110	626500	6402453	626493	6402465	7	-12	14	148		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:46:31	78	11746_ENV2_C			Camera	110	626500	6402453	626493	6402465	7	-12	14	149		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:47:38	79	11746_ENV2_C			Camera	110	626497	6402453	626493	6402465	4	-12	12	163		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:48:22	80	11746_ENV2_C			Camera	110	626494	6402454	626493	6402465	1	-11	11	175		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:49:29	81	11746_ENV2_C			Camera	110	626490	6402456	626493	6402465	-3	-9	10	197		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:50:02	82	11746_ENV2_C			Camera	110	626488	6402457	626493	6402465	-5	-8	10	210		(Raw Nav, SeaSpyder) (B)

APPENDIX A FIELD SAMPLING LOGS

Seafloor Sampling Imagery Summary

Job No	11746			Vessel	MV *Kommandor*					
Client	CNOOC International			Vessel Reference Point (VRP)	CoG					
Project Name	Green Volt Export Cable Route			Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z 4.72
Primary Positioning System	CNav A 3050			Actual Coordinates derived from	Beacon					
Geodetic Reference System	Datum	ED50	Ellipsoid	International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W	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		
25-Sep-2021	19:50:49	83	11746_ENV2_C			Camera	110	626486	6402459	626493	6402465	-7	-6	10	227		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:51:47	84	11746_ENV2_C			Camera	110	626483	6402461	626493	6402465	-10	-4	11	248		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:52:20	85	11746_ENV2_C			Camera	110	626483	6402463	626493	6402465	-10	-2	11	257		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:53:00	86	11746_ENV2_C			Camera	110	626482	6402465	626493	6402465	-11	0	11	272		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:53:25	87	11746_ENV2_C			Camera	110	626483	6402468	626493	6402465	-10	3	11	284		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:54:17	88	11746_ENV2_C			Camera	110	626484	6402470	626493	6402465	-9	5	10	298		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:54:42	89	11746_ENV2_C			Camera	110	626484	6402471	626493	6402465	-9	6	10	303		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:55:17	90	11746_ENV2_C			Camera	110	626485	6402472	626493	6402465	-8	7	11	312		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:56:05	91	11746_ENV2_C			Camera	110	626485	6402474	626493	6402465	-8	9	12	318		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:56:32	92	11746_ENV2_C			Camera	110	626485	6402476	626493	6402465	-8	11	14	323		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:58:17	93	11746_ENV2_C			Camera	110	626491	6402477	626493	6402465	-2	12	12	350		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	19:58:59	94	11746_ENV2_C			Camera	110	626493	6402476	626493	6402465	0	11	11	3		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:19:42	95	11746_ENV1_C			Camera	120	632710	6406336	632705	6406322	5	14	15	21		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:19:42	95a	11746_ENV1_C			Camera	120	632710	6406336	632705	6406322	5	14	15	21		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:20:04	96	11746_ENV1_C			Camera	120	632710	6406335	632705	6406322	5	13	14	21		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:20:43	97	11746_ENV1_C			Camera	120	632709	6406333	632705	6406322	4	11	11	19		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:21:40	98	11746_ENV1_C			Camera	120	632709	6406329	632705	6406322	4	7	8	28		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:21:55	99	11746_ENV1_C			Camera	120	632709	6406328	632705	6406322	4	6	7	30		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:22:16	100	11746_ENV1_C			Camera	120	632708	6406327	632705	6406322	3	5	6	36		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:22:57	101	11746_ENV1_C			Camera	120	632709	6406325	632705	6406322	4	3	5	48		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:23:32	102	11746_ENV1_C			Camera	120	632709	6406323	632705	6406322	4	1	5	78		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:24:06	103	11746_ENV1_C			Camera	120	632711	6406322	632705	6406322	6	0	6	92		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:24:31	104	11746_ENV1_C			Camera	120	632711	6406321	632705	6406322	6	-1	6	100		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:25:12	105	11746_ENV1_C			Camera	120	632711	6406318	632705	6406322	6	-4	7	127		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:25:39	106	11746_ENV1_C			Camera	120	632709	6406316	632705	6406322	4	-6	7	146		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:26:15	107	11746_ENV1_C			Camera	120	632709	6406313	632705	6406322	4	-9	10	155		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:27:12	108	11746_ENV1_C			Camera	120	632710	6406310	632705	6406322	5	-12	13	159		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:27:59	109	11746_ENV1_C			Camera	120	632709	6406308	632705	6406322	4	-14	14	162		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:29:02	110	11746_ENV1_C			Camera	120	632708	6406309	632705	6406322	3	-13	13	166		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:30:01	111	11746_ENV1_C			Camera	120	632705	6406310	632705	6406322	0	-12	12	180		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:30:54	112	11746_ENV1_C			Camera	120	632703	6406311	632705	6406322	-2	-11	11	189		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:31:30	113	11746_ENV1_C			Camera	120	632702	6406312	632705	6406322	-3	-10	11	199		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:31:52	114	11746_ENV1_C			Camera	120	632700	6406312	632705	6406322	-5	-10	11	205		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:32:43	115	11746_ENV1_C			Camera	120	632698	6406314	632705	6406322	-7	-8	11	223		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:32:46	116	11746_ENV1_C			Camera	120	632698	6406315	632705	6406322	-7	-7	10	224		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:33:54	117	11746_ENV1_C			Camera	120	632695	6406318	632705	6406322	-10	-4	11	248		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:34:32	118	11746_ENV1_C			Camera	120	632694	6406319	632705	6406322	-11	-3	12	255		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:35:32	119	11746_ENV1_C			Camera	120	632694	6406319	632705	6406322	-11	-3	11	257		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:36:06	120	11746_ENV1_C			Camera	120	632694	6406321	632705	6406322	-11	-1	11	262		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:36:39	121	11746_ENV1_C			Camera	120	632695	6406322	632705	6406322	-10	0	10	271		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:37:12	122	11746_ENV1_C			Camera	120	632695	6406324	632705	6406322	-10	2	10	283		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:37:44	123	11746_ENV1_C			Camera	120	632696	6406326	632705	6406322	-10	4	10	294		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:38:45	124	11746_ENV1_C			Camera	120	632696	6406329	632705	6406322	-9	7	12	309		(Raw Nav, SeaSpyder) (B)

APPENDIX A FIELD SAMPLING LOGS

Seafloor Sampling Imagery Summary

Job No	11746			Vessel	MV *Kommandor*							
Client	CNOOC International			Vessel Reference Point (VRP)	CoG							
Project Name	Green Volt Export Cable Route			Deployment Location	ENV Deployment Point	x	-8.64	y	-5.39	z	4.72	
Primary Positioning System	CNav A 3050			Actual Coordinates derived from	Beacon							
Geodetic Reference System	Datum	ED50	Ellipsoid	International 1924 (Hayford 1910)	Projection	UTM Zone 31N, CM 3°W			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		
25-Sep-2021	21:39:05	125	11746_ENV1_C			Camera	120	632697	6406330	632705	6406322	-8	8	11	315		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:40:29	126	11746_ENV1_C			Camera	120	632699	6406331	632705	6406322	-6	9	11	324		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:41:36	127	11746_ENV1_C			Camera	120	632701	6406332	632705	6406322	-4	10	11	340		(Raw Nav, SeaSpyder) (B)
25-Sep-2021	21:43:05	128	11746_ENV1_C			Camera	120	632708	6406334	632705	6406322	3	12	12	13		(Raw Nav, SeaSpyder) (B)

APPENDIX A FIELD SAMPLING LOGS

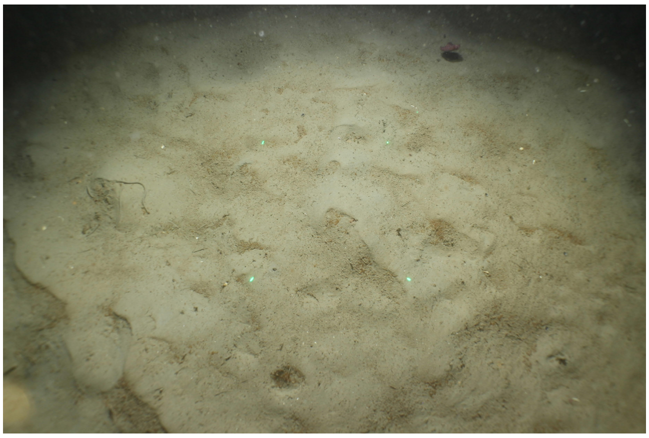
Seafloor Sampling Positioning Summary

Job No	11746			Vessel	MV *Kommandor*				
Client	CNOOC Petroleum Europe Limited			Vessel Reference Point (VRP)	CoG				
Project Name	Green Volt Export Cable Route			Deployment Location	Surface Navigation	x	-8.64	y	-5.39	z	4.72
Primary Positioning System	CNAV 5000			Actual Coordinates derived from	Deployment Location / Beacon (delete as appropriate)				
Geodetic Reference System	Datum	WGS84 - ED50 EPSG: 1613	Ellipsoid	International 1924 (Hayford 1910), EPSG 7022	Projection	UTM ZONE 30N (3W), EPSG 16030	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		
28-Sep-2021	20:44:00	129	11746_ENV5_G	50	MFA	Grab	94	600601	6388686	600603	6388686	-2	0	2	286	AW	
28-Sep-2021	20:56:00	130	11746_ENV5_G	80	CHEM	Grab	94	600602	6388686	600603	6388686	-1	0	1	288	AW	
28-Sep-2021	21:17:00	131	11746_ENV5_G	60	MFB	Grab	94	600602	6388687	600603	6388686	-1	1	1	317	AW	
28-Sep-2021	21:24:00	132	11746_ENV5_G	50	MFC	Grab	94	600600	6388687	600603	6388686	-3	1	3	291	AW	
28-Sep-2021	22:32:00	133	11746_ENV4_G	40	MFC	Grab	82	611324	6394002	611323	6394005	1	-3	3	152	AW	
28-Sep-2021	22:40:00	134	11746_ENV4_G	60	CHEM	Grab	82	611324	6394003	611323	6394005	1	-2	2	148	SS	
28-Sep-2021	23:03:25	135	11746_ENV4_G	50	MFA	Grab	82	611324	6394007	611323	6394005	1	2	3	15	SS	
28-Sep-2021	23:20:33	136	11746_ENV4_G	40	MFB	Grab	82	611321	6394008	611323	6394005	-2	3	3	329	SS	
29-Sep-2021	00:40:40	137	11746_ENV3_G	50	MFA	Grab	98	620237	6398567	620234	6398569	3	-2	3	128	SS	
29-Sep-2021	00:52:28	138	11746_ENV3_G	40	MFB	Grab	98	620237	6398567	620234	6398569	3	-2	4	120	SS	
29-Sep-2021	01:05:02	139	11746_ENV3_G	<40	NS	Grab	98	620235	6398568	620234	6398569	1	-1	1	136	SS	
29-Sep-2021	01:14:24	140	11746_ENV3_G	50	CHEM	Grab	98	620238	6398568	620234	6398569	4	-1	4	105	SS	
29-Sep-2021	01:31:25	141	11746_ENV3_G	50	MFC	Grab	98	620234	6398566	620234	6398569	0	-3	3	189	SS	
29-Sep-2021	02:40:33	142	11746_ENV2_G	<40	NS	Grab	110	626498	6402462	626493	6402465	5	-3	6	125	SS	
29-Sep-2021	02:58:50	143	11746_ENV2_G	<40	NS	Grab	110	626494	6402463	626493	6402465	1	-2	2	165	SS	
29-Sep-2021	03:13:52	144	11746_ENV2_G	<40	NS	Grab	110	626491	6402469	626493	6402465	-2	4	5	332	SS	
29-Sep-2021	03:34:01	145	11746_ENV2_G	<40	NS	Grab	110	626497	6402466	626493	6402465	4	1	4	81	SS	
29-Sep-2021	05:06:45	146	11746_ENV1_G	90	MFA	Grab	121	632704	6406320	632705	6406322	-1	-2	2	212	SS	
29-Sep-2021	05:19:32	147	11746_ENV1_G	90	CHEM	Grab	121	632705	6406321	632705	6406322	0	-1	1	188	SS	
29-Sep-2021	05:39:11	148	11746_ENV1_G	0	NS	Grab	121	632704	6406320	632705	6406322	-1	-2	3	196	SS	
29-Sep-2021	05:47:29	149	11746_ENV1_G	80	MFB	Grab	121	632705	6406322	632705	6406322	0	0	1	55	SS	
29-Sep-2021	05:59:57	150	11746_ENV1_G	80	MFC	Grab	121	632707	6406323	632705	6406322	2	1	2	68	SS	

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

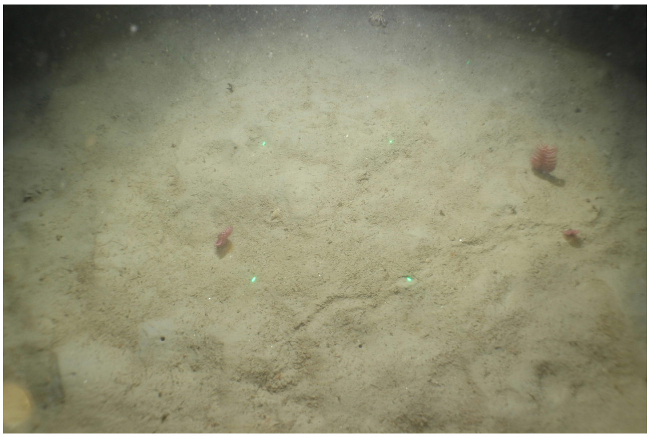
APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS



Station: 11745_ENV1_C
Fix: 111 **E:** 638667 **N:** 6419238 Depth (m): 114

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Burrow, Cnidaria *(Pennatula phosphorea*), Mollusca (Scaphopoda)



Station: 11745_ENV1_C
Fix: 118 **E:** 638663 **N:** 6419244 Depth (m): 114

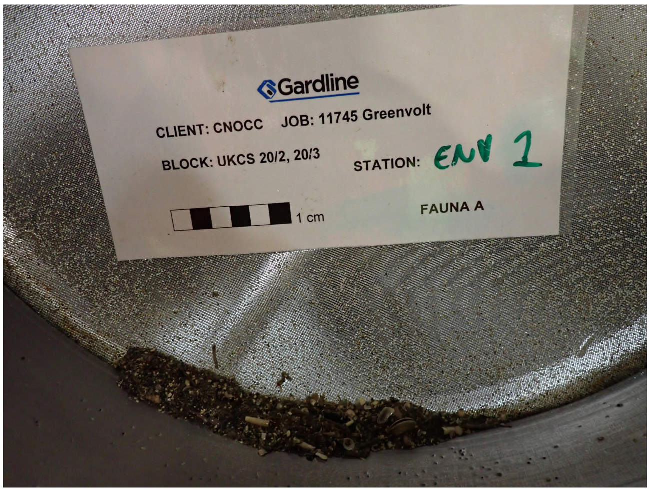
Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Arthropoda (Paguroidea), Cnidaria *(P. phosphore*a), Faunal Turf

Station: 11745_ENV1_G
Fix: 384 **E:** 638667 **N:** 6419241 Depth (m): 114
Retention: MFA

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta), Mollusca (Bivalvia)



Station: 11745_ENV1_G
Fix: 384 **E:** 638667 **N:** 6419241 Depth (m): 114
Retention: MFA

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta), Mollusca (Bivalvia)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11745_ENV2_C
Fix: 138 **E:** 641630 **N:** 6420345 Depth (m): 110

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Annelida (*Ampharete falcata*), Burrows, Cnidaria (*P. phosphorea*), Faunal Turf

Station: 11745_ENV2_C
Fix: 153 **E:** 641634 **N:** 6420346 Depth (m): 110

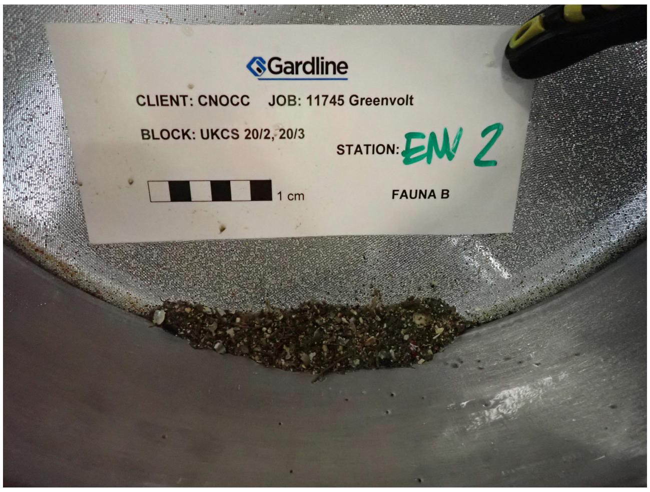
Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Annelida (*A. falcata*), Burrows, Cnidaria (*P. phosphorea*), Faunal Turf

Station: 11745_ENV2_G
Fix: 382 **E:** 641633 **N:** 6420340 Depth (m): 111
Retention: MFB

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta)

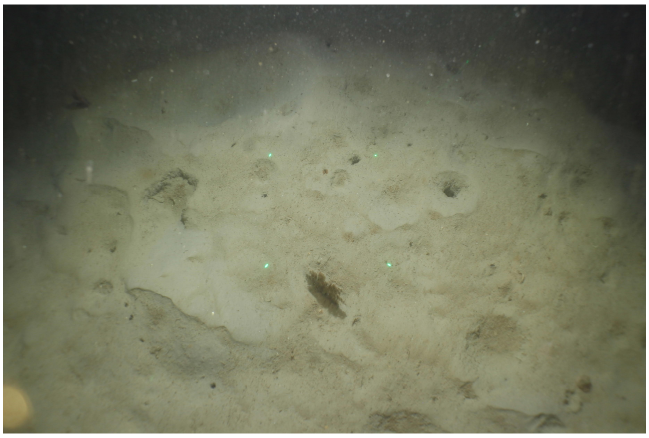


Station: 11745_ENV2_G
Fix: 382 **E:** 641633 **N:** 6420340 Depth (m): 111
Retention: MFB

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta)

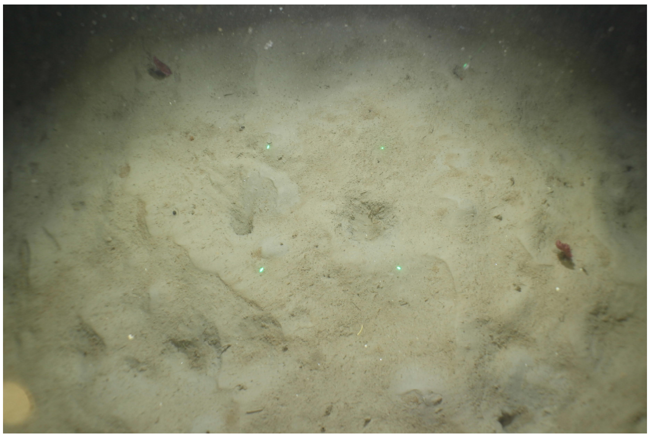
APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS



Station: 11745_ENV3_C
Fix: 88 **E:** 641435 **N:** 6418174 Depth (m): 115

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Annelida (*A. falcata*), Burrows, Cnidaria (*P. phosphorea*), Faunal Turf



Station: 11745_ENV3_C
Fix: 101 **E:** 641444 **N:** 6418173 Depth (m): 115

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Burrows, Cnidaria (*P. phosphorea*), Faunal Turf, Mollusca (Scaphopoda)

Station: 11745_ENV3_G
Fix: 392 **E:** 641437 **N:** 6418177 Depth (m): 113
Retention: MFC

Sediment Description:
Muddy sand

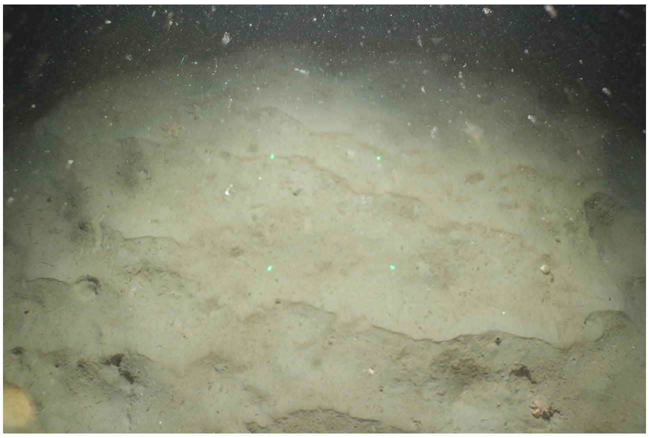
Faunal Description:
Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Gastropoda)

Station: 11745_ENV3_G
Fix: 392 **E:** 641437 **N:** 6418177 Depth (m): 113
Retention: MFC

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Gastropoda)

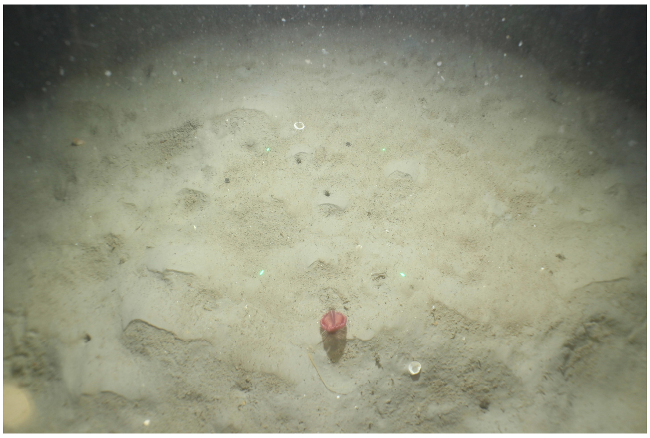
APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS



Station: 11745_ENV4_C
Fix: 37 **E:** 641341 **N:** 6415992 Depth (m): 121

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Annelida *(A. falcata*), Arthropoda (Paguroidea), Burrows, Cnidaria *(Adamsia* sp.), Echinodermata *(Astropecten irregularis*)



Station: 11745_ENV4_C
Fix: 42 **E:** 641347 **N:** 6415992 Depth (m): 115

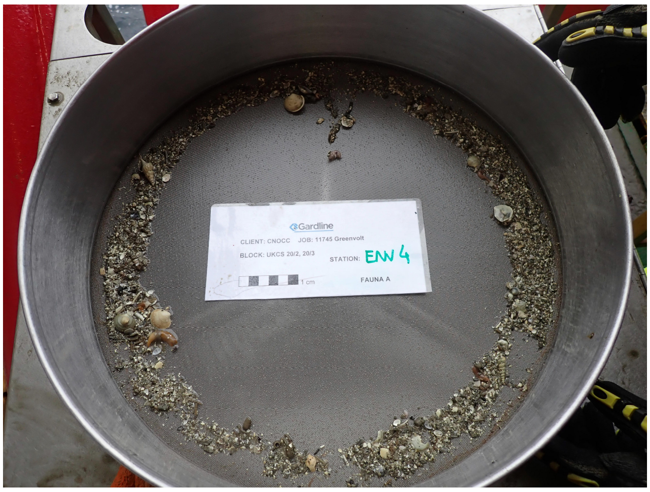
Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Annelida *(A. falcata*), Burrows, Cnidaria *(P. phosphore*a), Faunal Turf

Station: 11745_ENV4_G
Fix: 393 **E:** 641345 **N:** 6416003 Depth (m): 113
Retention: MFA

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta), Arthropoda (Isopoda), Mollusca (Gastropoda)



Station: 11745_ENV4_G
Fix: 393 **E:** 641345 **N:** 6416003 Depth (m): 113
Retention: MFA

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta), Arthropoda (Isopoda), Mollusca (Gastropoda)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11745_ENV5_C
Fix: 65 **E:** 639620 **N:** 6414319 Depth (m): 110

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Annelida *(A. falcata*), Arthropoda (Paguroidea), Burrows, Cnidaria *(Adamsia* sp., *P. phosphorea*), Faunal Turf, Mollusca (Scaphopoda)

Station: 11745_ENV5_C
Fix: 66 **E:** 639618 **N:** 6414322 Depth (m): 110

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Annelida *(A. falcata*), Chordata *(Myxine glutinosa*), Faunal Turf, Mollusca (Scaphopoda)

Station: 11745_ENV5_G
Fix: 402 **E:** 639619 **N:** 6414324 Depth (m): 111
Retention: MFA

Sediment Description:
Muddy sand

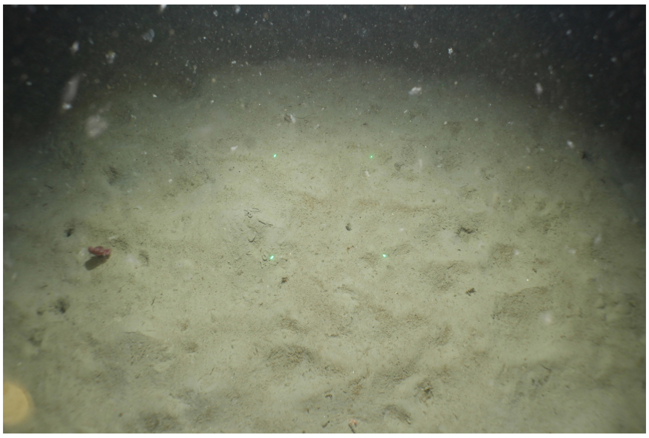
Faunal Description:
Annelida (Polychaeta), Arthropoda (Amphipoda), Echinodermata (Ophiuroidea), Mollusca (Gastropoda, Scaphopoda)

Station: 11745_ENV5_G
Fix: 402 **E:** 639619 **N:** 6414324 Depth (m): 111
Retention: MFA

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta), Arthropoda (Amphipoda), Echinodermata (Ophiuroidea), Mollusca (Gastropoda, Scaphopoda)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS



Station: 11745_ENV6_C
Fix: 11 **E:** 642938 **N:** 6414557 Depth (m): 114

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Annelida *(A. falcata*), Arthropoda (Paguroidea), Burrows, Cnidaria *(P. phosphore*a), Faunal Turf

Station: 11745_ENV6_C
Fix: 17 **E:** 642937 **N:** 6414563 Depth (m): 114

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Annelida *(A. falcata*), Burrows, Cnidaria *(P. phosphore*a)

Station: 11745_ENV6_G
Fix: 399 **E:** 642940 **N:** 6414555 Depth (m): 114
Retention: MFB

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta), Echinodermata (Echinoidea), Mollusca (Scaphopoda)

Station: 11745_ENV6_G
Fix: 399 **E:** 642940 **N:** 6414555 Depth (m): 114
Retention: MFB

Sediment Description:
Muddy sand

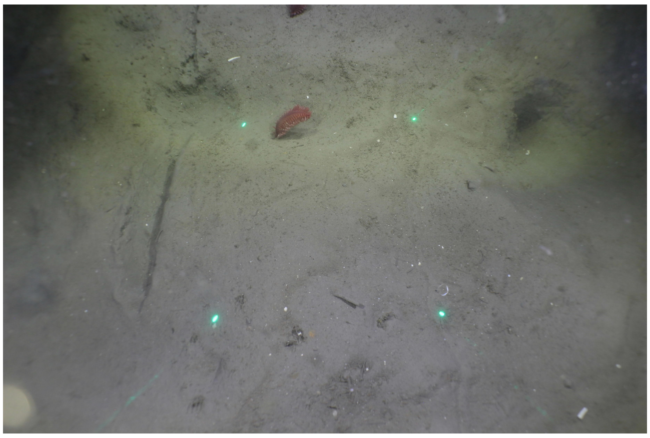
Faunal Description:
Annelida (Polychaeta), Echinodermata (Echinoidea), Mollusca (Scaphopoda)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11745_ENV10_C
Fix: 509 **E:** 641273 **N:** 6417242 Depth (m): 114

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

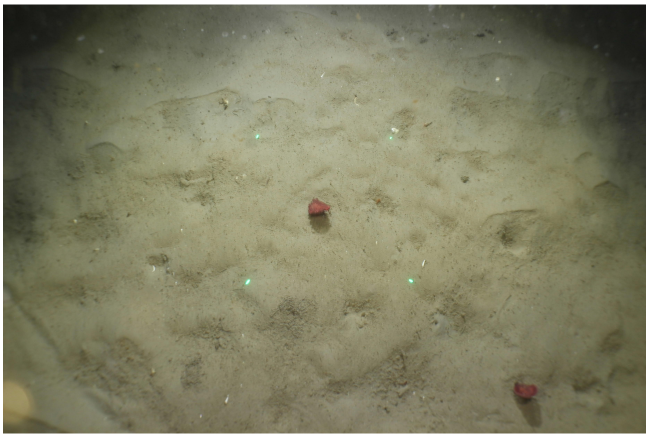
Faunal Description:
Annelida *(A. falcata*), Arthropoda (Paguroidea), Burrows, Cnidaria *(Adamsia* sp., *P. phosphorea*), Mollusca (Scaphopoda)



Station: 11745_ENV10_C
Fix: 517 **E:** 641263 **N:** 6417231 Depth (m): 114

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

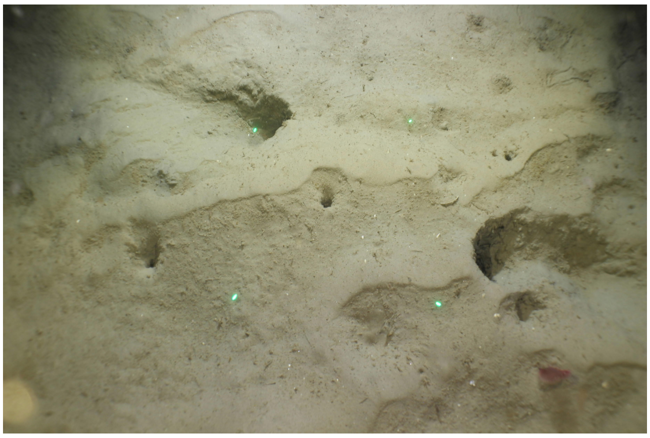
Faunal Description:
Animalia Tube, Burrow, Cnidaria *(P. phosphorea*), Faunal Turf, Mollusca (Scaphopoda)



Station: 11745_ENV10_C
Fix: 511 **E:** 641278 **N:** 6417238 Depth (m): 114

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Annelida *(A. falcata*), Burrows, Cnidaria *(P. phosphorea*)

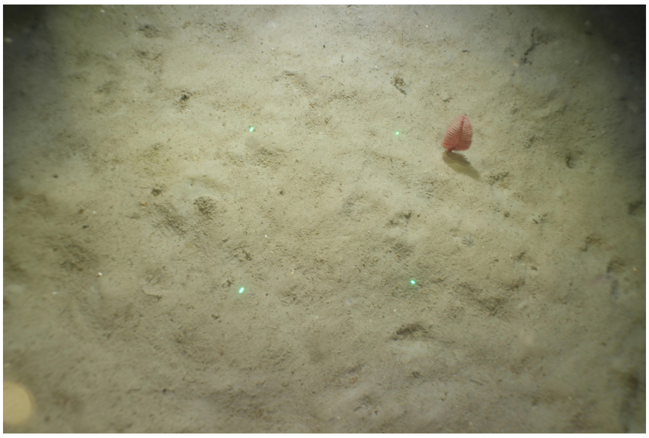


Station: 11745_ENV10_C
Fix: 523 **E:** 641269 **N:** 6417235 Depth (m): 114

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Annelida *(A. falcata*), Burrows, Cnidaria *(P. phosphorea*)

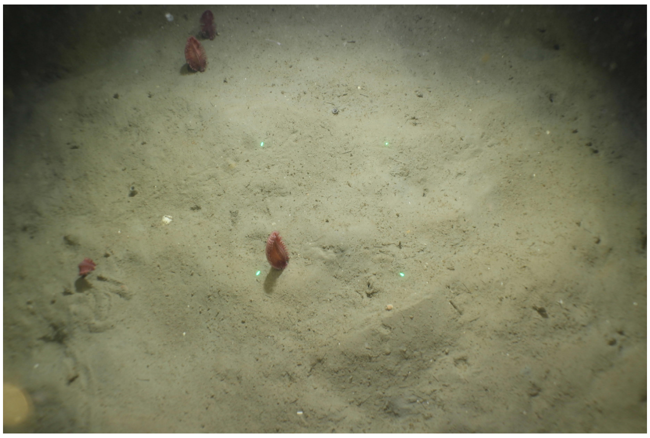
APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS



Station: 11745_ENV11_C
Fix: 533 **E:** 639146 **N:** 6416542 Depth (m): 113

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

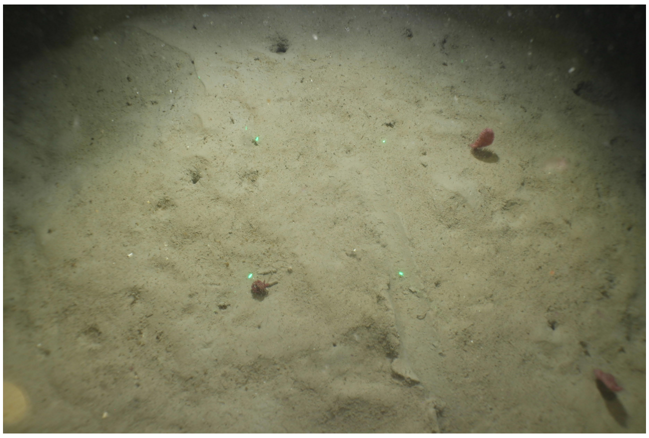
Faunal Description:
Cnidaria *(P. phosphorea)*, Faunal Turf



Station: 11745_ENV11_C
Fix: 543 **E:** 639145 **N:** 6416553 Depth (m): 109

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

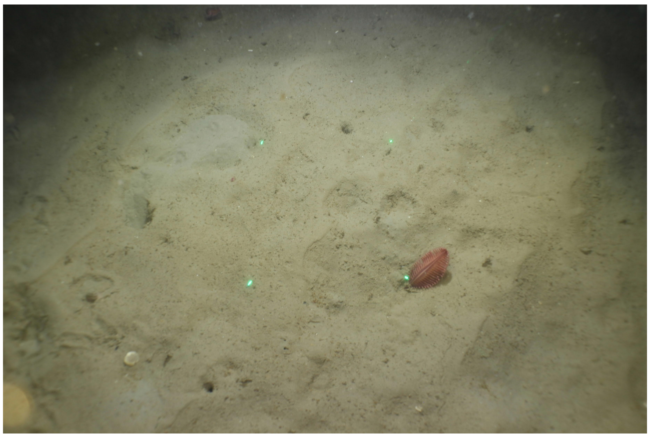
Faunal Description:
Animalia Tube, Annelida *(A. falcata)*, Arthropoda (Paguroidea), Cnidaria *(P. phosphorea)*, Faunal Turf, Mollusca (Scaphopoda)



Station: 11745_ENV11_C
Fix: 535 **E:** 639151 **N:** 6416549 Depth (m): 113

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Cnidaria *(P. phosphorea)*, Faunal Turf

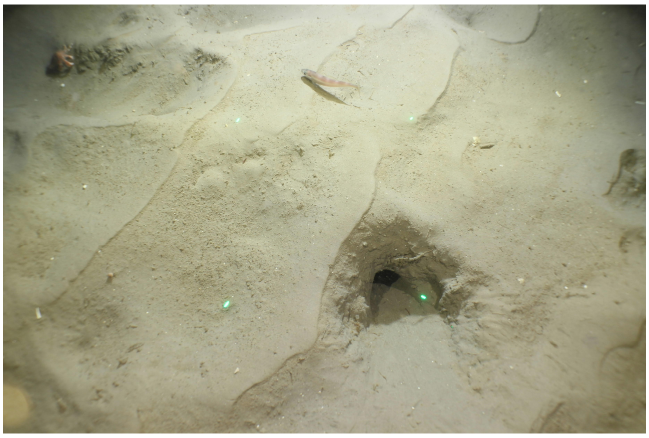


Station: 11745_ENV11_C
Fix: 539 **E:** 639147 **N:** 6416556 Depth (m): 114

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Animalia, Annelida *(A. falcata)*, Burrows, Cnidaria *(P. phosphorea)*

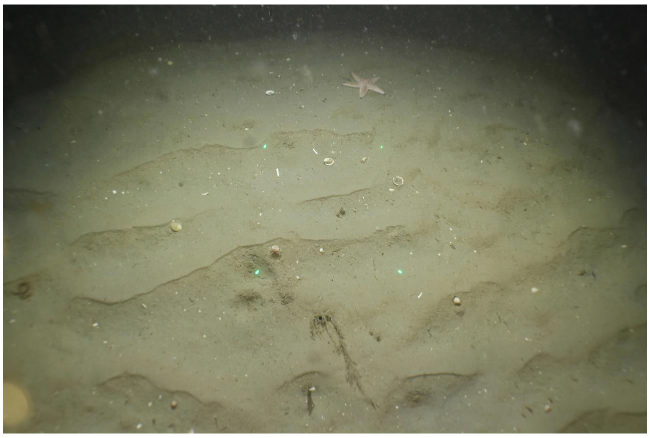
APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS



Station: 11745_ENV12_C
Fix: 476 **E:** 643958 **N:** 6416304 Depth (m): 116

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

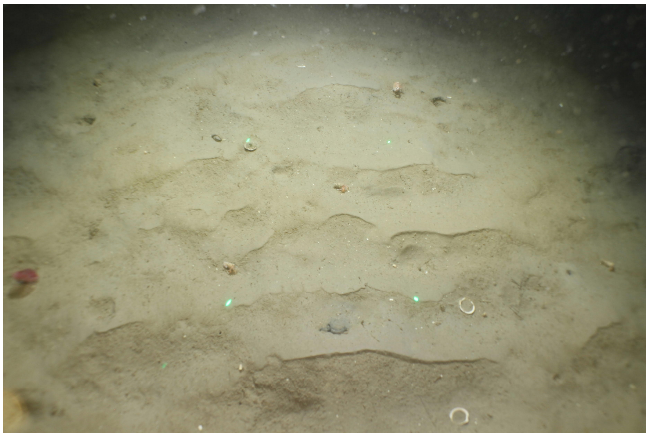
Faunal Description:
Animalia Tube, Annelida *(A. falcata*), Arthropoda (Paguroidea), Burrow, Chordata (Actinopterygii), Mollusca (Scaphopoda)



Station: 11745_ENV12_C
Fix: 478 **E:** 643964 **N:** 6416303 Depth (m): 116

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Annelida *(A. falcata*), Arthropoda (Paguroidea), Echinodermata *(A. irregularis*), Faunal Turf, Mollusca (Scaphopoda)



Station: 11745_ENV12_C
Fix: 464 **E:** 643957 **N:** 6416307 Depth (m): 116

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Annelida *(A. falcata*), Arthropoda (Paguroidea), Cnidaria *(P. phosphore*a)

Station: 11745_ENV12_C
Fix: 468 **E:** 643958 **N:** 6416317 Depth (m): 116

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

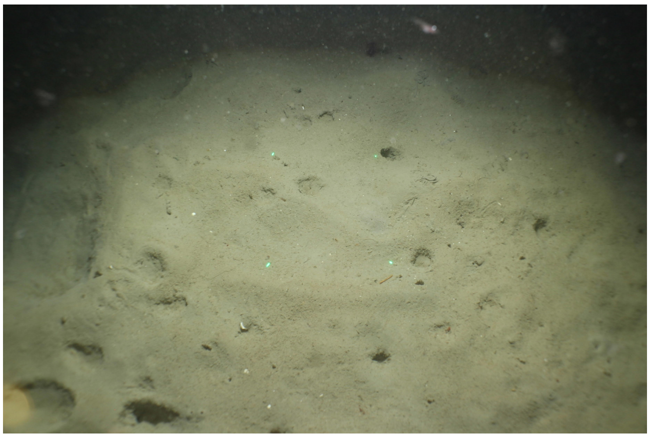
Faunal Description:
Annelida *(A. falcata*), Cnidaria *(P. phosphore*a)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11745_ENV14_C
Fix: 549 **E:** 635223 **N:** 6413366 Depth (m): 118

Sediment Description:
Lightly rippled, fine, sandy mud

Faunal Description:
Animalia Tube, Burrow, Chordata *(M. glutinosa*), Faunal Turf



Station: 11745_ENV14_C
Fix: 567 **E:** 635220 **N:** 6413360 Depth (m): 118

Sediment Description:
Lightly rippled, fine, sandy mud

Faunal Description:
Animalia, Burrows, Cnidaria *(P. phosphore*a), Mollusca (Scaphopoda)

Station: 11745_ENV14_G
Fix: 617 **E:** 635222 **N:** 6413361 Depth (m): 118
Retention: MFC

Sediment Description:
Sand

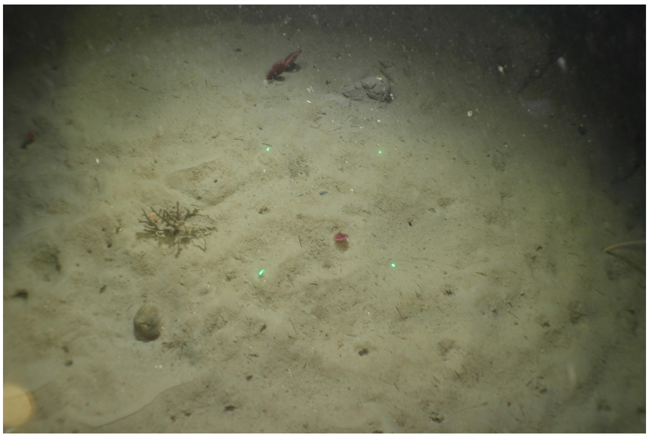
Faunal Description:
Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Bivalvia)

Station: 11745_ENV14_G
Fix: 617 **E:** 635222 **N:** 6413361 Depth (m): 118
Retention: MFC

Sediment Description:
Sand

Faunal Description:
Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Bivalvia)

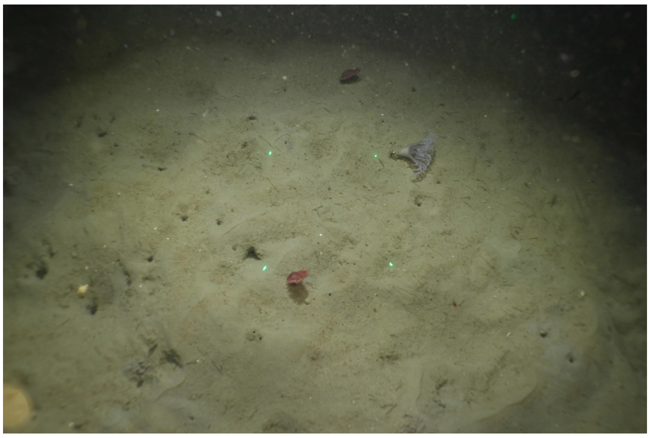
APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS



Station: 11745_ENV15_C
Fix: 438 **E:** 638103 **N:** 6414445 Depth (m): 111

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

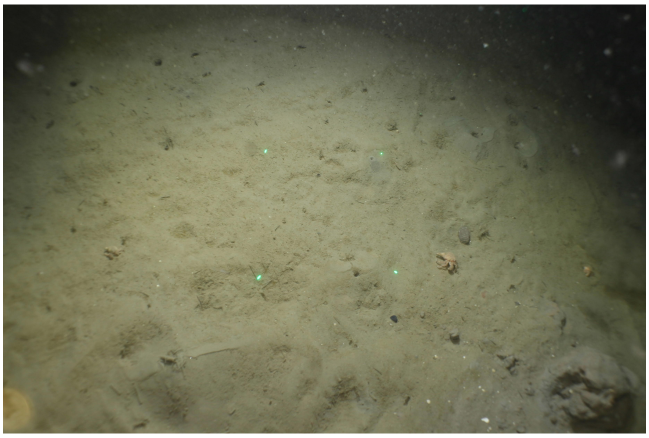
Faunal Description:
Annelida *(A. falcata*), Arthropoda (Paguroidea, Pycnogonida), Burrows, Cnidaria *(P. phosphore*a, *Virgulari*a sp.), Echinodermata *(Echinocardium cordatu*m), Faunal Turf



Station: 11745_ENV15_C
Fix: 454 **E:** 638098 **N:** 6414455 Depth (m): 111

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

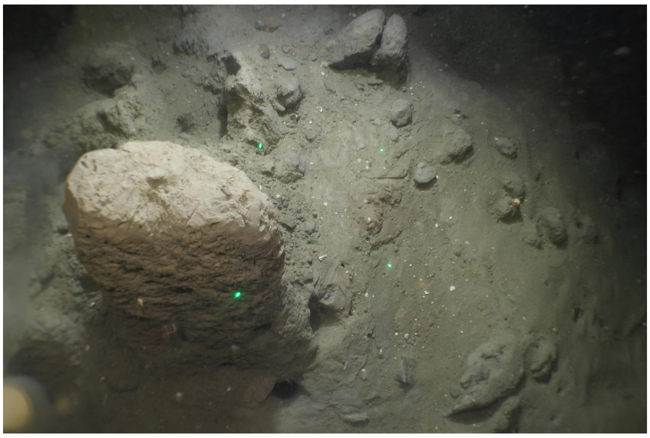
Faunal Description:
Animalia Tube, Annelida (A. falcata), Burrows, Cnidaria (Ceriantharia, *P. phosphore*a)



Station: 11745_ENV15_C
Fix: 445 **E:** 638103 **N:** 6414453 Depth (m): 111

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Annelida *(A. falcat*a), Arthropoda (Paguroidea), Burrows



Station: 11745_ENV15_C
Fix: 449 **E:** 638103 **N:** 6414456 Depth (m): 111

Sediment Description:
Fine silty sand overlying clay formation

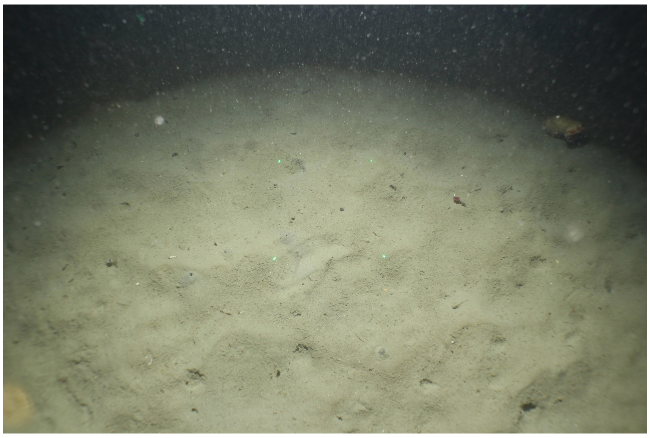
Faunal Description:
Arthropoda (Paguroidea), Burrows

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11745_ENV16_C
Fix: 570 **E:** 635319 **N:** 6414564 Depth (m): 115

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Animalia, Animalia Tube, Annelida (*A. falcata*, *Oxydromus flexuosus*), Arthropoda (Decapoda), Burrows, Faunal Turf, Porifera



Station: 11745_ENV16_C
Fix: 576 **E:** 635322 **N:** 6414578 Depth (m): 115

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Annelida (*A. falcata*), Burrow, Cnidaria (*Hormathia digitata*, *P. phosphorea*), Mollusca (Scaphopoda)

Station: 11745_ENV16_G
Fix: 615 **E:** 635326 **N:** 6414567 Depth (m): 116
Retention: MFB

Sediment Description:
Sand

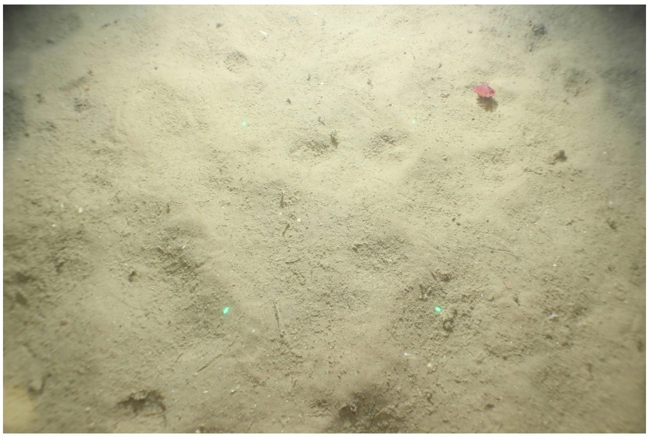
Faunal Description:
Annelida (Polychaeta), Arthropoda (Amphipoda), Mollusca (Scaphopoda)

Station: 11745_ENV16_G
Fix: 615 **E:** 635326 **N:** 6414567 Depth (m): 116
Retention: MFB

Sediment Description:
Sand

Faunal Description:
Annelida (Polychaeta), Arthropoda (Amphipoda), Mollusca (Scaphopoda)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS



Station: 11745_ENV17_C
Fix: 591 **E:** 630599 **N:** 6412036 Depth (m): 98

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia, Annelida *(A. falcata*, *O. flexuosus*), Cnidaria *(P. phosphorea*)

Station: 11745_ENV17_C
Fix: 597 **E:** 630590 **N:** 6412037 Depth (m): 98

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Annelida *(O. flexuosus*), Burrow, Faunal Turf, Mollusca (Scaphopoda)

Station: 11745_ENV17_G
Fix: 609 **E:** 630598 **N:** 6412044 Depth (m): 98
Retention: MFA

Sediment Description:
Slightly anoxic sand

Faunal Description:
Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Bivalvia, Gastropoda)

Station: 11745_ENV17_G
Fix: 609 **E:** 630598 **N:** 6412044 Depth (m): 98
Retention: MFA

Sediment Description:
Slightly anoxic sand

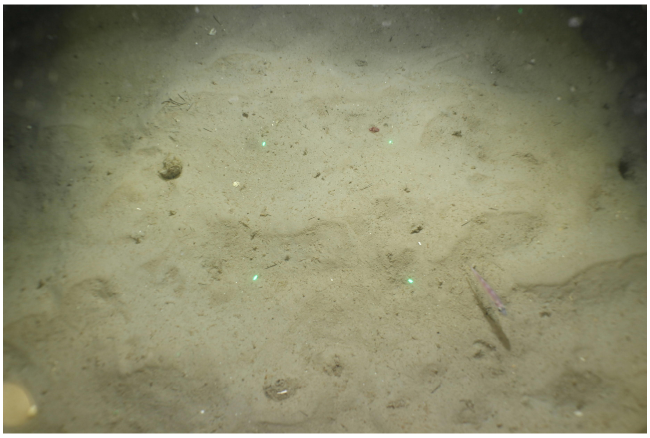
Faunal Description:
Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Bivalvia, Gastropoda)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11745_ENV18_C
Fix: 406 **E:** 637533 **N:** 6411914 Depth (m): 115

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Annelida (*A. falcata*), Chordata (Actinopterygii), Cnidaria (*P. phosphorea*), Mollusca (Scaphopoda)



Station: 11745_ENV18_C
Fix: 426 **E:** 637530 **N:** 6411913 Depth (m): 115

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia, Animalia Tube, Annelida (*A. falcata*), Burrow, Chordata (Actinopterygii), Cnidaria (*P. phosphorea*)

Station: 11745_ENV18_G
Fix: 546 **E:** 637531 **N:** 6411915 Depth (m): 115
Retention: MFB

Sediment Description:
Muddy sand

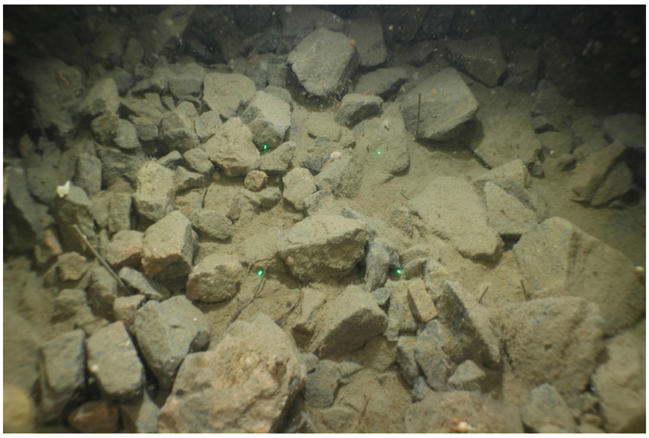
Faunal Description:
Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda)

Station: 11745_ENV18_G
Fix: 546 **E:** 637531 **N:** 6411915 Depth (m): 115
Retention: MFB

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS



Station: 11745_TR_ENV7
Fix: 171 **E:** 643075 **N:** 6419980 Depth (m): 111

Sediment Description:
Fine silty sand with shell fragments, overlying anthropogenic cobbles and boulders

Faunal Description:
Animalia Tube, Annelida (Serpulidae), Arthropoda (Paguroidea), Echinodermata *(cf. Echinus esculentu*s), Faunal Turf

Station: 11745_TR_ENV7
Fix: 207 **E:** 643152 **N:** 6419999 Depth (m): 111

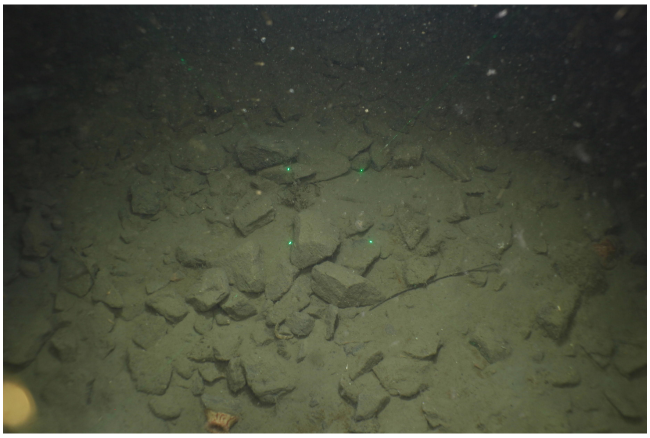
Sediment Description:
Fine silty sand with shell fragments, overlying anthropogenic cobbles and boulders

Faunal Description:
Bryozoa *(Reteporell*a sp.), Faunal Turf, Porifera

Station: 11745_TR_ENV7
Fix: 209 **E:** 643153 **N:** 6419999 Depth (m): 111

Sediment Description:
Fine silty sand with shell fragments, overlying anthropogenic cobbles and boulders

Faunal Description:
Animalia Tube, Annelida (Serpulidae), Bryozoa *(Reteporella<I> sp.), Chordata* (Molva molva*), Cnidaria (Actiniaria,* Nemertesia sp.), Faunal Turf, Porifera



Station: 11745_TR_ENV7
Fix: 237 **E:** 643218 **N:** 6420021 Depth (m): 111

Sediment Description:
Fine silty sand with shell fragments, overlying anthropogenic cobbles and boulders

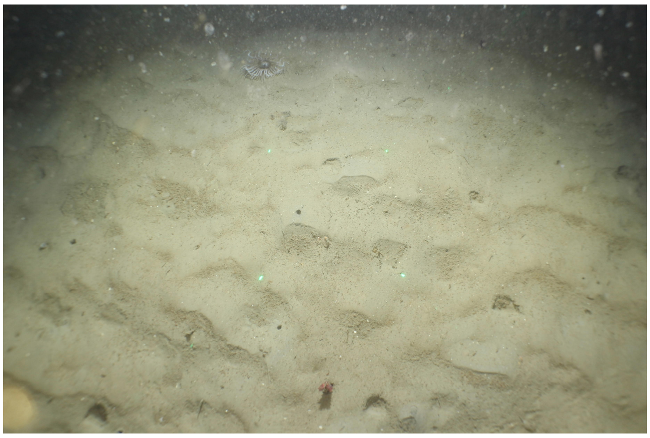
Faunal Description:
Annelida (Serpulidae), Cnidaria (Actiniaria), Faunal Turf, Mollusca (Octopoda)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11745_TR_ENV8
Fix: 311 **E:** 641408 **N:** 6421837 Depth (m): 111

Sediment Description:
Fine silty sand with shell fragments, overlying anthropogenic cobbles and boulders

Faunal Description:
Animalia Tube, Annelida (Serpulidae), Chordata *(Glyptocephalus cynoglossus*), Echinodermata *(cf. E. esculentus*)



Station: 11745_TR_ENV8
Fix: 347 **E:** 641385 **N:** 6421757 Depth (m): 110

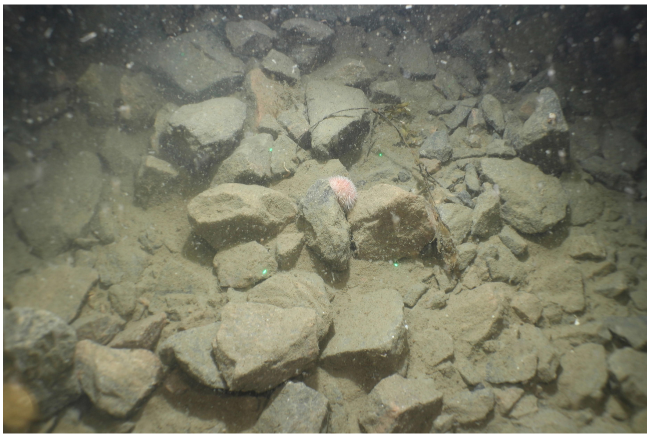
Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Annelida *(A. falcata*), Burrow, Cnidaria (Ceriantharia, *P. phosphore*a)

Station: 11745_TR_ENV8
Fix: 357 **E:** 641377 **N:** 6421728 Depth (m): 111

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Annelida *(A. falcata*), Cnidaria *(P. phosphore*a), Echinodermata *(Asterias rubens*)

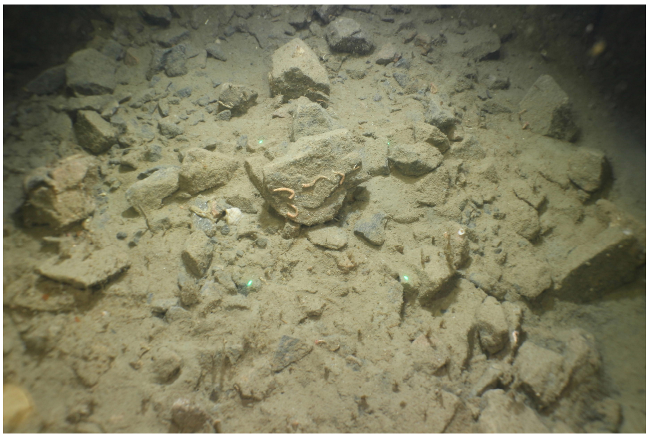


Station: 11745_TR_ENV8
Fix: 369 **E:** 641368 **N:** 6421695 Depth (m): 111

Sediment Description:
Fine silty sand with shell fragments, overlying anthropogenic cobbles and boulders

Faunal Description:
Annelida (Serpulidae), Arthropoda (Paguroidea), Echinodermata *(cf. E. esculentus*)

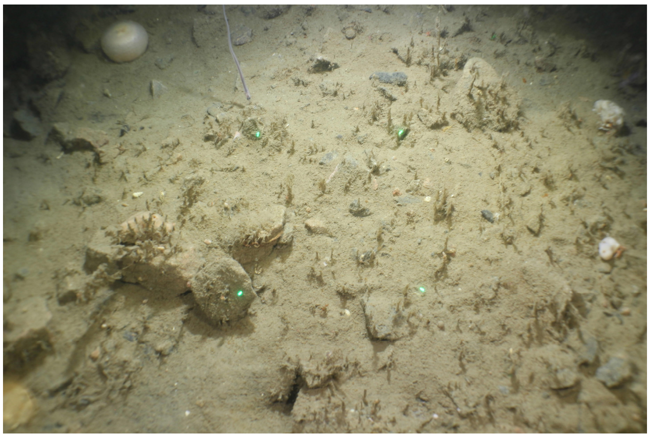
APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS



Station: 11745_TR_ENV9
Fix: 249 **E:** 643850 **N:** 6422355 Depth (m): 112

Sediment Description:
Fine silty sand with shell fragments, overlying anthropogenic cobbles and boulders

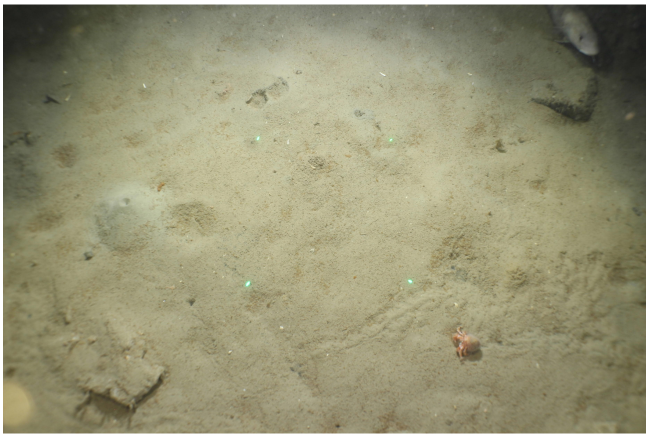
Faunal Description:
Annelida (Serpulidae), Cnidaria (*Tubularia indivisa*)



Station: 11745_TR_ENV9
Fix: 252 **E:** 643848 **N:** 6422357 Depth (m): 112

Sediment Description:
Fine silty sand with shell fragments, overlying anthropogenic cobbles and boulders

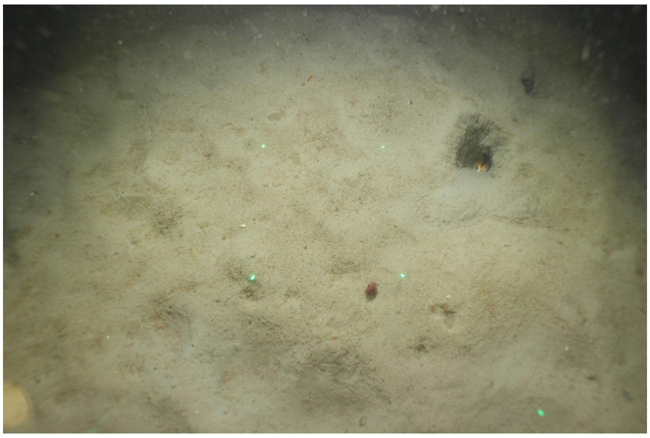
Faunal Description:
Animalia Tube, Annelida (Serpulidae), Arthropoda (Paguroidea), Bryozoa (*Reteporella* sp.), Chordata (*cf. Ammodytes* sp.), Cnidaria (Actiniaria), Faunal Turf, Porifera



Station: 11745_TR_ENV9
Fix: 279 **E:** 643797 **N:** 6422406 Depth (m): 112

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

Faunal Description:
Animalia Tube, Arthropoda (*Pagurus prideaux*), Chordata (*Gadus morhua*), Cnidaria (*Adamsia* sp.)



Station: 11745_TR_ENV9
Fix: 289 **E:** 643777 **N:** 6422427 Depth (m): 112

Sediment Description:
Lightly rippled, fine, silty sand with shell fragments

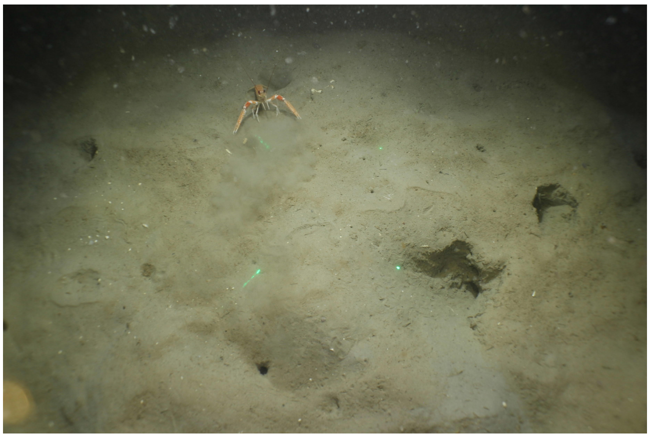
Faunal Description:
Arthropoda (*Nephrops norvegicus*), Burrows, Cnidaria (*P. phosphorea*)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11745_TR_ENV13
Fix: 489 **E:** 643617 **N:** 6419199 Depth (m): 114

Sediment Description:
Lightly rippled, fine, silty mud with shell fragments

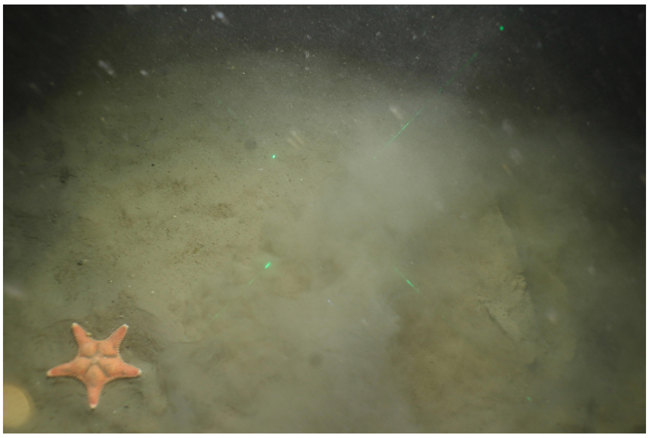
Faunal Description:
Animalia Tube, Annelida *(A. falcata*), Burrows, Cnidaria *(P. phosphore*a), Echinodermata *(Ophiur*a sp.)



Station: 11745_TR_ENV13
Fix: 492 **E:** 643600 **N:** 6419200 Depth (m): 114

Sediment Description:
Lightly rippled, fine, silty mud with shell fragments

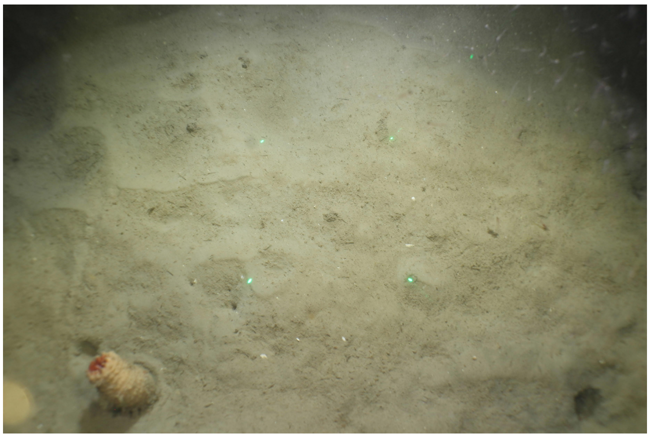
Faunal Description:
Annelida *(A. falcat*a), Arthropoda *(N. norvegicu*s), Burrows



Station: 11745_TR_ENV13
Fix: 498 **E:** 643574 **N:** 6419197 Depth (m): 114

Sediment Description:
Lightly rippled, fine, silty mud with shell fragments

Faunal Description:
Animalia Tube, Echinodermata *(Hippasteri*a sp.)



Station: 11745_TR_ENV13
Fix: 504 **E:** 643545 **N:** 6419197 Depth (m): 113

Sediment Description:
Lightly rippled, fine, silty mud with shell fragments

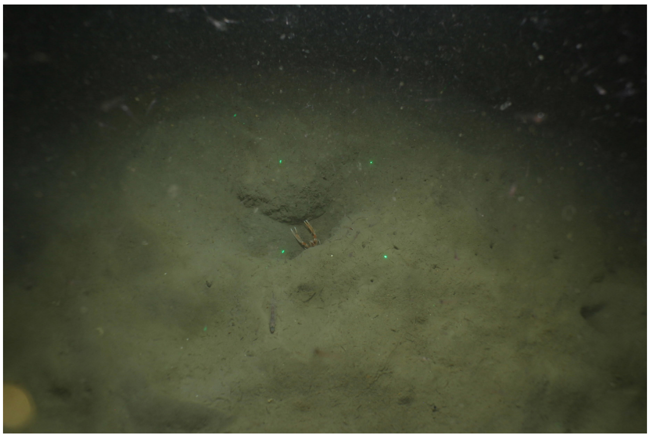
Faunal Description:
Animalia Tube, Annelida *(A. falcat*a), Burrows, Cnidaria *(H. digitat*a)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11746_ENV1_C
Fix: 104 **E:** 641440 **N:** 6418171 Depth (m): 115

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Animalia Tube, Annelida *(A. falcata*), Annelida *(Chaetopterus* sp.), Burrow, Cnidaria *(P.phosphore*a), Faunal Turf, Mollusca (Scaphopoda)



Station: 11746_ENV1_C
Fix: 121 **E:** 638670 **N:** 6419250 Depth (m): 114

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Annelida *(A. falcata*), Arthropoda *(N. norvegicus*), Burrow, Chordata (Gobiidae)

Station: 11746_ENV1_G
Fix: 146 **E:** 632704 **N:** 6406320 Depth (m): 121
Retention: MFA

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta), Cnidaria *(P.phosphore*a), Echinodermata (Echinoidea, Ophiuriudea), Mollusca (Scaphopoda)

Station: 11746_ENV1_G
Fix: 146 **E:** 632704 **N:** 6406320 Depth (m): 121
Retention: MFA

Sediment Description:
Muddy sand

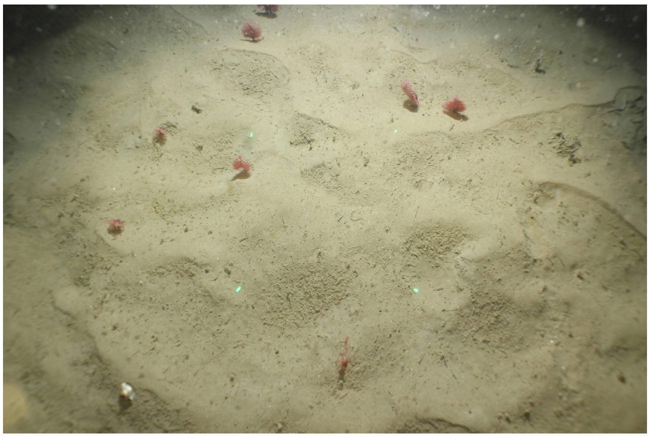
Faunal Description:
Annelida (Polychaeta), Cnidaria *(P.phosphore*a), Echinodermata (Echinoidea, Ophiuriudea), Mollusca (Scaphopoda)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11746_ENV2_C
Fix: 63 **E:** 639620 **N:** 6414313 Depth (m): 110

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Annelida *(A. falcata*), Burrow, Chordata (Actinopterygii), Cnidaria *(Nemertesia* sp.), Cnidaria *(P.phosphore*a), Fauna Turf



Station: 11746_ENV2_C
Fix: 77 **E:** 639611 **N:** 6414320 Depth (m): 111

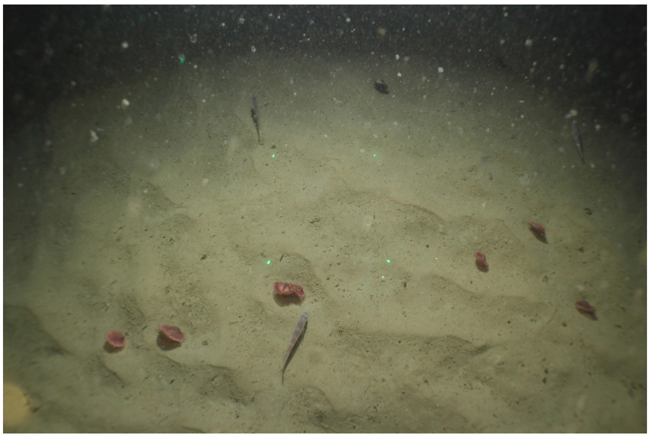
Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Animalia Tube, Annelida *(A. falcata*), Arthropoda (Caridea, Paguroidea), Burrow, Cnidaria *(P.phosphore*a), Faunal Turf

Station: 11746_ENV2_C
Fix: 80 **E:** 639614 **N:** 6414314 Depth (m): 190

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Animalia Tube, Annelida *(A. falcata*), Burrow, Chordata (Actinopterygii msp0001), Cnidaria *(P.phosphore*a), Faunal Turf



Station: 11746_ENV2_C
Fix: 93 **E:** 641434 **N:** 6418182 Depth (m): 115

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

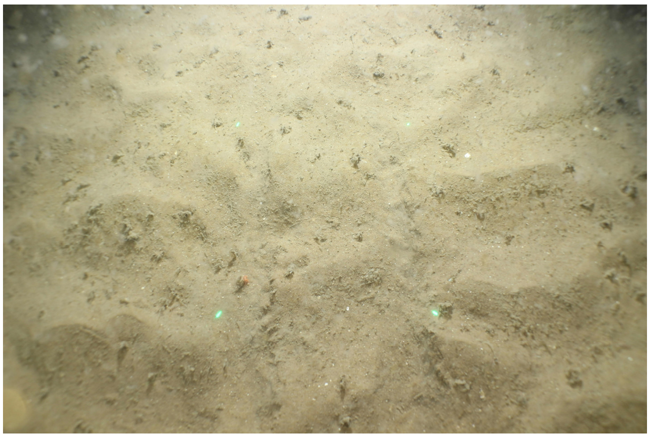
Faunal Description:
Annelida *(A. falcata*), Burrow, Chordata (Actinopterygii), Cnidaria *(P.phosphore*a), Faunal Turf

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11746_ENV3_C
Fix: 47 **E:** 641352 **N:** 6415994 Depth (m): 115

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Annelida *(A. falcata*), Chordata (Gobiidae), Echinodermata *(Luidia sarsi*), Faunal Turf, Mollusca (Scaphopoda)



Station: 11746_ENV3_C
Fix: 57 **E:** 641341 **N:** 6416005 Depth (m): 129

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Annelida *(A. falcata*), Arthropoda (Paguroidea), Faunal Turf

Station: 11746_ENV3_G
Fix: 138 **E:** 620237 **N:** 6398567 Depth (m): 98
Retention: MFB

Sediment Description:
Sand with shell fragments

Faunal Description:
Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda)

Station: 11746_ENV3_G
Fix: 138 **E:** 620237 **N:** 6398567 Depth (m): 98
Retention: MFB

Sediment Description:
Sand with shell fragments

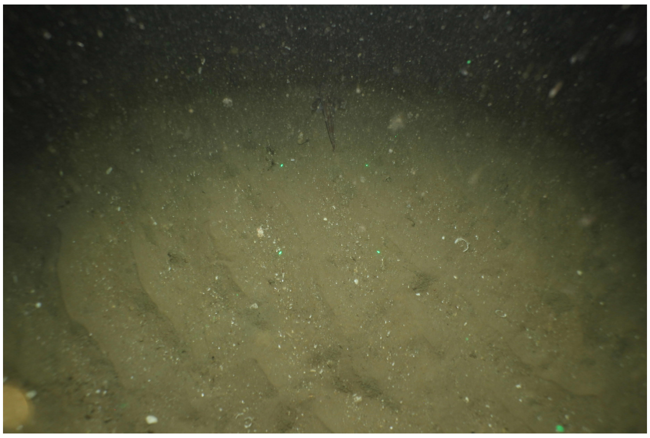
Faunal Description:
Annelida (Polychaeta), Echinodermata (Ophiuroidea), Mollusca (Scaphopoda)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS

Station: 11746_ENV4_C
Fix: 33 **E:** 641343 **N:** 6415987 Depth (m): 115

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

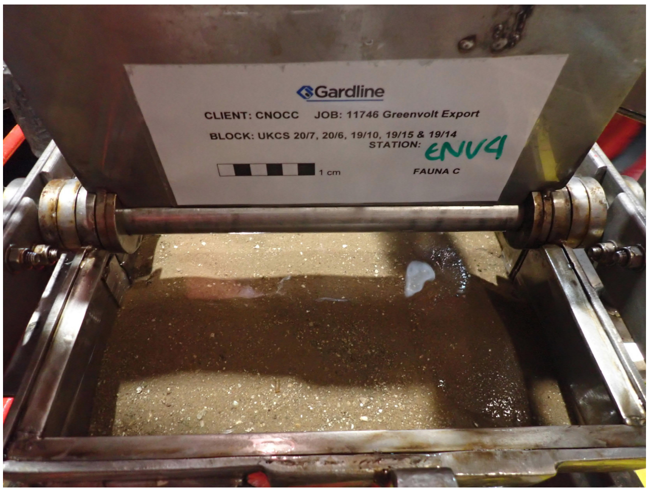
Faunal Description:
Annelida (*A. falcata*), Faunal Turf, Mollusca (Scaphopoda)



Station: 11746_ENV4_C
Fix: 37 **E:** 641341 **N:** 6415992 Depth (m): 121

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Annelida (*A. falcata*), Chordata (Gobiidae), Faunal Turf, Mollusca (Scaphopoda)



Station: 11746_ENV4_G
Fix: 133 **E:** 611324 **N:** 6394002 Depth (m): 82
Retention: MFC

Sediment Description:
Sand with shell fragments and pebbles

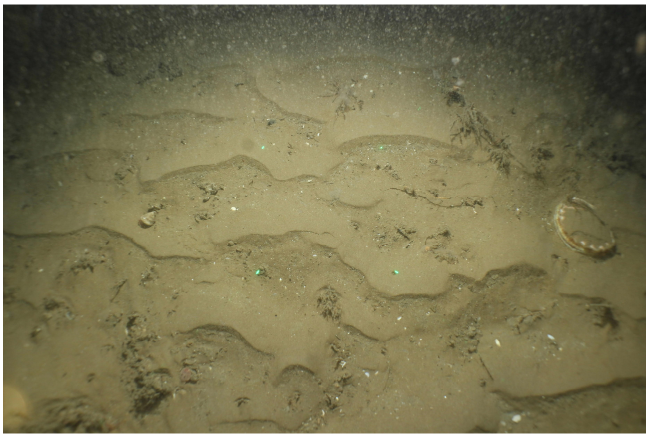
Faunal Description:
Annelida (Polychaeta), Mollusca (Scaphopoda)

Station: 11746_ENV4_G
Fix: 133 **E:** 611324 **N:** 6394002 Depth (m): 82
Retention: MFC

Sediment Description:
Sand with shell fragments and pebbles

Faunal Description:
Annelida (Polychaeta), Mollusca (Scaphopoda)

APPENDIX B SAMPLING AND SEABED PHOTOGRAPHS



Station: 11746_ENV5_C
Fix: 4 **E:** 642938 **N:** 6414550 Depth (m): 114

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Annelida *(A. falcata*), Cnidaria *(Nemertesi*a sp.), Faunal Turf, Mollusca (Pectinidae, Scaphopoda)

Station: 11746_ENV5_C
Fix: 18 **E:** 642936 **N:** 6414563 Depth (m): 114

Sediment Description:
Lightly rippled, fine, sandy mud with shell fragments

Faunal Description:
Animalia Tube, Burrow, Chordata *(Limanda limanda*), Cnidaria *(Nemertesi*a sp.), Faunal Turf

Station: 11746_ENV5_G
Fix: 129 **E:** 600601 **N:** 6388686 Depth (m): 94
Retention: MFA

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta), Arthropoda (Nephoropidae), Cnidaria (Anthozoa, Hydrozoa), Echinodermata (Ophiuroidea), Mollusca (Bivalvia)

Station: 11746_ENV5_G
Fix: 129 **E:** 600601 **N:** 6388686 Depth (m): 94
Retention: MFA

Sediment Description:
Muddy sand

Faunal Description:
Annelida (Polychaeta), Arthropoda (Nephoropidae), Cnidaria (Anthozoa, Hydrozoa), Echinodermata (Ophiuroidea), Mollusca (Bivalvia)

APPENDIX C FAUNAL OBSERVATION SUMMARY

APPENDIX C FAUNAL OBSERVATION SUMMARY

Table C.1 Semi-Quantitative Faunal Summary

Transect/Station	11745_ENV1	11745_ENV2	11745_ENV3	11745_ENV4	11745_ENV5	11745_ENV6	11745_ENV7	11745_ENV8	11745_ENV9	11745_ENV10	11745_ENV11	11745_ENV12	11745_ENV13	11745_ENV14	11745_ENV15	11745_ENV16	11745_ENV17	11745_ENV18	11746_ENV1	11746_ENV2	11746_ENV3	11746_ENV4	11746_ENV5	Total
Number of Images Assessed	80	43	67	57	68	47	63	59	32	59	56	37	51	63	170	142	131	77	74	108	41	17	24	**1566**
Phylum - Taxon	Abundance																							
Chordata - *Gadus morhua*	0	0	0	0	0	0	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**5**
Chordata - *Melanogrammus aeglefinus*	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Chordata - *Molva molva*	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Cnidaria - *Pennatula phosphorea*	137	33	112	63	71	56	144	148	88	86	92	20	78	61	84	50	53	82	66	487	27	0	0	**2038**
Cnidaria - *Virgularia sp.*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	**3**
Total Sea Pens	**137**	**33**	**112**	**63**	**71**	**56**	**144**	**148**	**88**	**86**	**92**	**20**	**78**	**61**	**86**	**50**	**53**	**82**	**66**	**488**	**27**	0	0	**2041**

Table C.2 Other Faunal Summary

Transect/Station	11745_ENV1	11745_ENV2	11745_ENV3	11745_ENV4	11745_ENV5	11745_ENV6	11745_ENV7	11745_ENV8	11745_ENV9	11745_ENV10	11745_ENV11	11745_ENV12	11745_ENV13	11745_ENV14	11745_ENV15	11745_ENV16	11745_ENV17	11745_ENV18	11746_ENV1	11746_ENV2	11746_ENV3	11746_ENV4	11746_ENV5	Total
Number of Photographs Assessed	27	25	25	27	27	30	82	64	65	17	20	20	26	20	27	20	17	26	34	31	23	16	22	691
Phylum - Taxon	Present in % Stills																							
Animalia 01	0	4	0	0	4	0	0	0	6	0	5	0	8	0	0	0	18	4	3	0	9	0	0	**2**
Animalia 02	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Animalia indet	0	12	8	15	19	3	2	0	5	0	15	5	0	30	0	0	0	0	6	0	0	0	0	**5**
Animalia Tube	48	56	40	48	59	60	50	50	68	47	35	50	77	65	52	45	47	46	47	45	39	44	68	**53**
Annelida - *Ampharete falcata*	19	76	16	44	85	47	46	80	32	35	40	50	62	40	93	65	59	77	94	87	87	81	77	**60**
Annelida - Echiura	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Annelida - *Hyalinoecia tubicola*	0	0	0	0	0	0	0	3	3	0	0	10	0	0	0	0	6	0	0	0	0	6	0	**1**
Annelida - *Oxydromus flexuosus*	0	0	0	0	0	0	0	6	6	0	0	0	0	0	0	5	12	4	3	0	0	0	0	**2**
Annelida - Serpulidae	0	0	0	0	0	0	24	13	11	0	0	0	0	0	0	0	6	0	0	0	0	0	5	**5**
Annelida - Terebellidae	0	0	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Annelida 01	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	24	4	3	0	0	0	0	**1**
Annelida indet	0	0	0	4	0	0	0	2	0	0	0	5	0	0	0	5	0	4	0	0	0	0	0	**1**
Arthropoda - *Cancer pagurus*	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Arthropoda - Caridea	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	8	0	3	0	0	36	**2**
Arthropoda - Cirripedia	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Arthropoda - Decapoda 01	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**P**
Arthropoda - Decapoda 03	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	10	0	4	0	0	0	0	0	**1**
Arthropoda - *Ebalia* sp.	0	0	4	0	0	0	2	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	5	**1**
Arthropoda - *Lithodes maja*	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**P**
Arthropoda - *Nephrops norvegicus*	0	0	0	0	0	0	0	0	2	0	0	0	8	0	0	0	0	0	3	0	0	0	0	**1**
Arthropoda - Paguroidea	15	4	8	19	4	13	16	34	20	18	10	65	12	5	59	5	6	8	6	13	17	0	41	**18**
Arthropoda - *Pagurus prideaux*	0	0	0	0	0	0	0	0	2	0	0	15	0	0	0	0	0	0	0	0	0	0	0	**1**
Arthropoda - Pycnogonida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	**0**
Bryozoa - *Reteporella* sp.	0	0	0	0	0	0	10	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Burrow	74	88	76	70	63	73	34	23	75	82	80	50	69	95	78	70	24	42	88	39	4	6	9	**56**
Chordata - Actinopterygii 01	0	0	0	0	0	0	4	3	6	0	0	10	0	0	11	0	0	15	3	45	0	0	0	**5**
Chordata - Actinopterygii 02	0	0	0	0	4	0	1	0	3	0	0	10	0	0	0	0	0	12	0	10	0	0	0	**2**
Chordata - Actinopterygii indet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	3	0	0	0	**0**
Chordata - *cf*. *Ammodytes* sp.	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Chordata - *Eutrigla gurnardus*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	**0**
Chordata - *Gadus morhua*	0	0	0	0	0	0	1	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Chordata - *Glyptocephalus cynoglossus*	0	0	0	0	0	0	0	2	3	0	0	0	4	0	0	5	0	0	0	0	0	0	0	**1**
Chordata - Gobiidae	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	**1**
Chordata - *Limanda limanda*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	**0**
Chordata - Lotidae	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Chordata - *Melanogrammus aeglefinus*	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Chordata - *Molva molva*	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Chordata - *Myxine glutinosa*	0	0	0	0	4	0	1	0	3	6	0	5	0	10	0	0	0	0	6	0	0	0	0	**1**
Chordata - Pleuronectiformes indet	0	4	0	0	0	0	1	6	2	0	0	0	0	0	0	0	0	0	6	6	0	6	0	**2**
Cnidaria - Actiniaria indet	0	0	0	0	0	0	11	5	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
Cnidaria - *Adamsia* sp.	0	0	0	4	4	0	0	0	2	6	0	15	0	0	0	0	0	0	0	0	0	0	0	**1**
Cnidaria - *Alcyonium digitatum*	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	10	0	0	0	0	0	6	5	**1**
Cnidaria - *Cellaria* sp.	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Cnidaria - Ceriantharia	0	0	0	0	0	0	0	3	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	**0**
Cnidaria - *Hormathia digitata*	0	0	0	0	0	0	2	0	0	0	0	0	4	0	0	5	0	0	0	0	0	0	0	**1**
Cnidaria - Hydrozoa 01	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	**0**
Cnidaria - Hydrozoa 03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	**0**
Cnidaria - *Nemertesia* sp.	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	**1**
Cnidaria - Pennatula phosphorea	70	36	64	56	37	63	37	45	28	82	70	25	58	70	67	85	41	81	35	100	26	0	0	**49**
Cnidaria - *Tubularia indivisa*	0	0	0	0	0	0	2	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	27	**2**
Cnidaria - *Virgularia* sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	**0**
Cnidaria - Zoantharia	0	0	0	0	0	0	0	3	8	0	0	0	0	0	0	0	6	0	0	6	0	0	0	**1**
Echinodermata - *Asterias rubens*	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Echinodermata - Asteroidea 02	0	0	0	0	0	3	6	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Echinodermata - *Astropecten irregularis*	0	0	0	4	0	0	4	2	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	**1**
Echinodermata - *cf*. *Echinus esculentus*	0	0	0	0	0	0	9	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Echinodermata - *Echinocardium cordatum*	4	0	0	0	0	0	0	0	0	6	0	0	0	0	7	0	0	0	6	3	0	0	0	**1**
Echinodermata - *Hippasteria* sp.	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	**0**
Echinodermata - *Luidia sarsii*	0	0	0	0	0	0	0	0	2	0	0	0	4	0	0	0	0	0	0	0	4	0	0	**0**
Echinodermata - *Ophiura* sp.	0	0	0	4	0	0	1	3	0	0	5	0	4	0	0	0	0	0	0	0	4	0	5	**1**
Faunal Turf	15	8	12	4	7	3	38	23	22	12	15	5	0	5	7	35	65	23	6	52	96	100	100	**27**
Mollusca - Anomiidae	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Mollusca - Bivalvia siphons	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	**0**
Mollusca - Buccinidae	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Mollusca - *Fjordia browni*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	**0**
Mollusca - Naticidae	0	0	0	0	0	0	0	3	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	**1**
Mollusca - Octopoda	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Mollusca - Pectinidae	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	9	**0**
Mollusca - Scaphopoda	30	0	4	0	7	3	13	14	8	29	10	15	0	20	0	25	24	19	15	3	57	56	45	**15**
Mollusca - Sepiida	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	4	0	0	4	0	0	**1**
Porifera indet	0	0	0	0	0	0	9	0	2	0	0	0	0	0	0	5	0	0	0	0	9	0	9	**2**
Porifera 01	0	0	0	0	0	0	5	0	2	0	0	0	0	0	0	0	0	0	0	0	0	6	9	**1**
Porifera 02	0	0	0	0	0	0	5	0	6	0	0	0	0	0	0	0	0	0	0	3	0	0	0	**1**
Porifera 03	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Porifera 04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	**0**
Porifera 05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	**0**

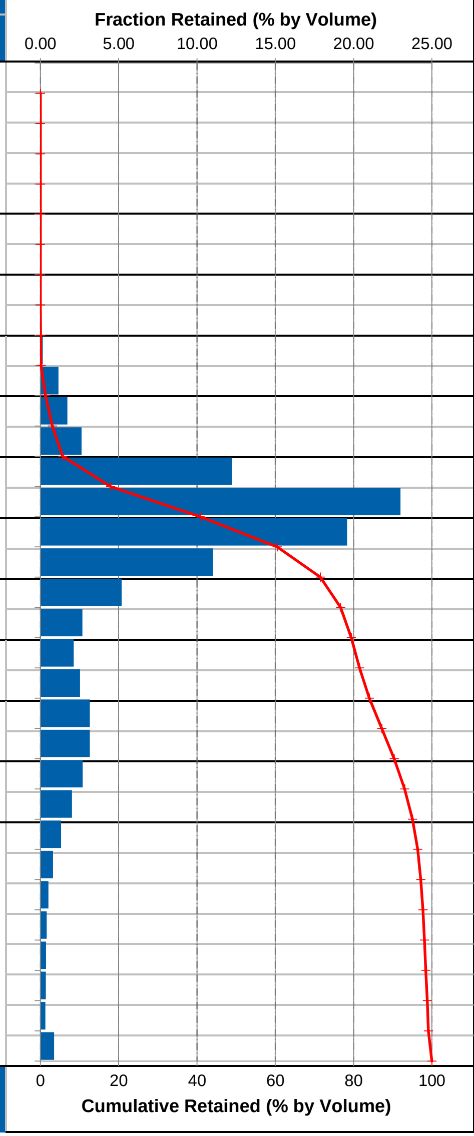
P = Present in video only

APPENDIX D PARTICLE SIZE ANALYSIS

APPENDIX D PARTICLE SIZE ANALYSIS

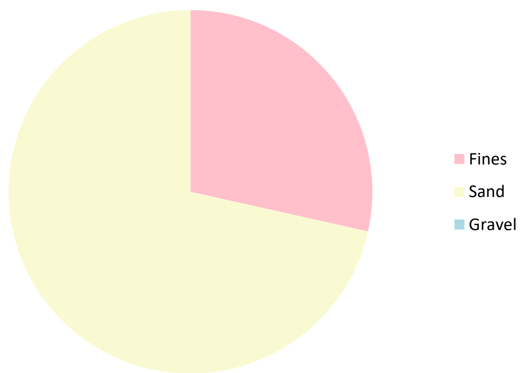
11745 ENV1

Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.00	0.00	
4000.00	-2.00	0.00	0.00	
2828.43	-1.50	0.00	0.00	Granule
2000.00	-1.00	0.01	0.01	
1414.21	-0.50	0.01	0.02	Very coarse sand
1000.00	0.00	0.02	0.03	
707.11	0.50	0.15	0.18	Coarse sand
500.00	1.00	1.16	1.34	
353.55	1.50	1.72	3.06	Medium sand
250.00	2.00	2.62	5.68	
176.78	2.50	12.23	17.92	Fine sand
125.00	3.00	23.00	40.91	
88.39	3.50	19.59	60.50	Very fine sand
62.50	4.00	11.01	71.52	
44.19	4.50	5.18	76.70	Coarse silt
31.25	5.00	2.68	79.38	
22.10	5.50	2.13	81.51	Medium silt
15.63	6.00	2.53	84.04	
11.05	6.50	3.15	87.19	Fine silt
7.81	7.00	3.16	90.36	
5.52	7.50	2.69	93.05	Very fine silt
3.91	8.00	2.01	95.06	
2.76	8.50	1.32	96.38	Clay
1.95	9.00	0.80	97.18	
1.38	9.50	0.51	97.70	
0.98	10.00	0.40	98.10	
0.69	10.50	0.36	98.46	
0.49	11.00	0.35	98.81	
0.35	11.50	0.32	99.13	
<0.35	>11.5	0.87	100.00	



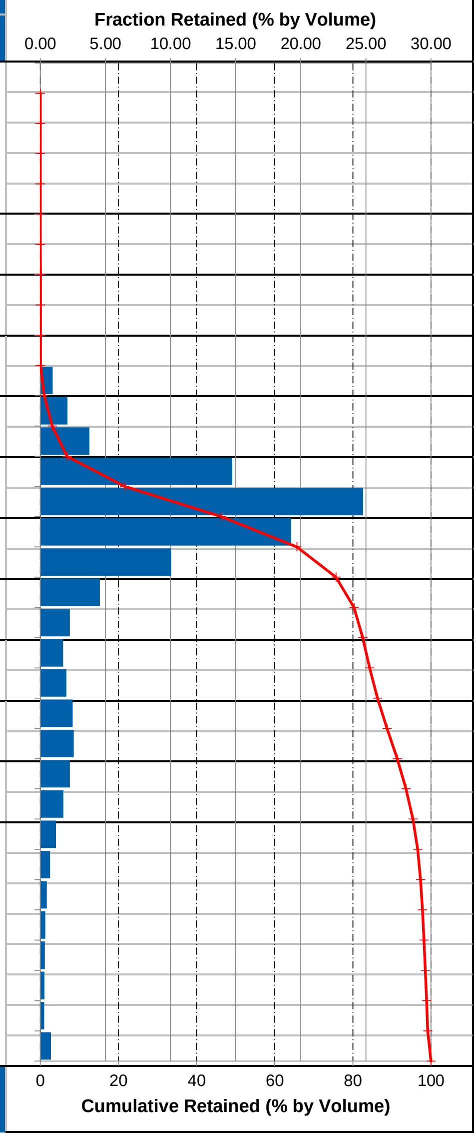
Method of Moments			
Geometric	Mean (µm)	67.70	Wentworth:
Logarithmic	Mean (Phi)	3.88	Very fine sand
	Sorting	2.03	Very poor
	Skewness	1.68	Very fine
	Kurtosis	6.15	Leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	67.84	Wentworth:
Logarithmic	Mean (Phi)	3.88	Very fine sand
	Sorting	1.82	Poor
	Skewness	0.55	Very fine
	Kurtosis	1.49	Leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	3.23	106.44	Very fine sand
1st Local Maxima (Mode)	3.00	125.00	Fine sand
2nd Local Maxima	7.00	7.81	Fine silt
3rd Local Maxima	-	-	-

Classification		Composition	
Modified Folk	Muddy sand	Fines	28.50%
EUNIS Folk	Mud and sandy mud	Sand	71.50%
Distribution	Bimodal	Gravel	0.00%



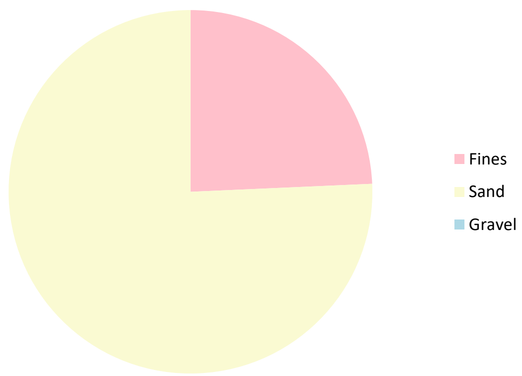
APPENDIX D PARTICLE SIZE ANALYSIS

11745 ENV2				
Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.00	0.00	
4000.00	-2.00	0.01	0.01	
2828.43	-1.50	0.01	0.02	Granule
2000.00	-1.00	0.01	0.02	
1414.21	-0.50	0.00	0.02	Very coarse sand
1000.00	0.00	0.00	0.02	
707.11	0.50	0.02	0.04	Coarse sand
500.00	1.00	0.95	0.99	
353.55	1.50	2.08	3.07	Medium sand
250.00	2.00	3.77	6.84	
176.78	2.50	14.74	21.58	Fine sand
125.00	3.00	24.79	46.38	
88.39	3.50	19.26	65.64	Very fine sand
62.50	4.00	10.06	75.70	
44.19	4.50	4.58	80.28	Coarse silt
31.25	5.00	2.27	82.55	
22.10	5.50	1.75	84.30	Medium silt
15.63	6.00	1.99	86.30	
11.05	6.50	2.49	88.78	Fine silt
7.81	7.00	2.57	91.35	
5.52	7.50	2.27	93.62	Very fine silt
3.91	8.00	1.76	95.38	
2.76	8.50	1.20	96.59	Clay
1.95	9.00	0.75	97.34	
1.38	9.50	0.50	97.84	
0.98	10.00	0.38	98.22	
0.69	10.50	0.34	98.56	
0.49	11.00	0.32	98.89	
0.35	11.50	0.30	99.18	
<0.35	>11.5	0.82	100.00	



Method of Moments			
Geometric	Mean (µm)	76.52	Wentworth:
Logarithmic	Mean (Phi)	3.71	Very fine sand
	Sorting	1.98	Poor
	Skewness	1.89	Very fine
	Kurtosis	7.04	Leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	82.12	Wentworth:
Logarithmic	Mean (Phi)	3.61	Very fine sand
	Sorting	1.71	Poor
	Skewness	0.53	Very fine
	Kurtosis	1.80	Very leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	3.09	117.11	Very fine sand
1st Local Maxima (Mode)	3.00	125.00	Fine sand
2nd Local Maxima	7.00	7.81	Fine silt
3rd Local Maxima	-	-	-

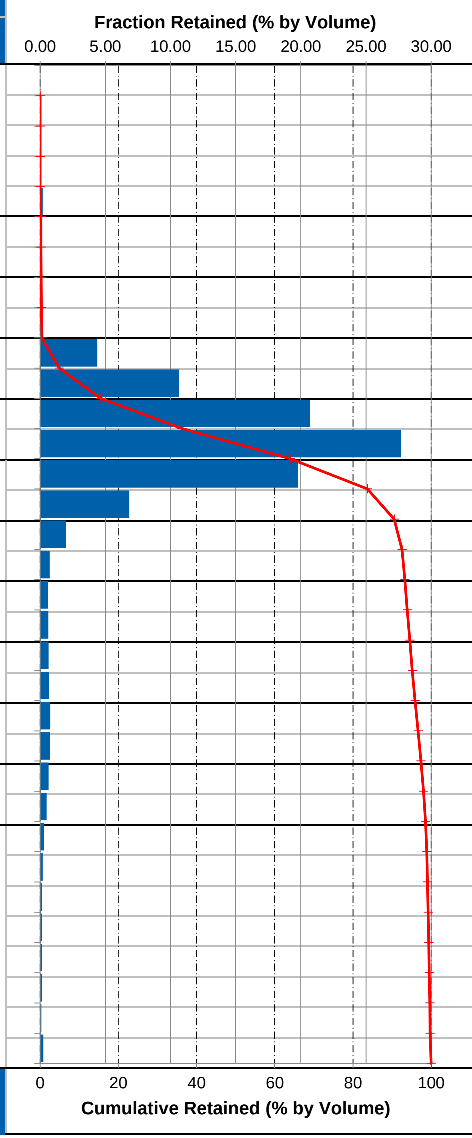
Classification		Composition	
Modified Folk	Muddy sand	Fines	24.30%
EUNIS Folk	Mud and sandy mud	Sand	75.70%
Distribution	Bimodal	Gravel	0.00%



APPENDIX D PARTICLE SIZE ANALYSIS

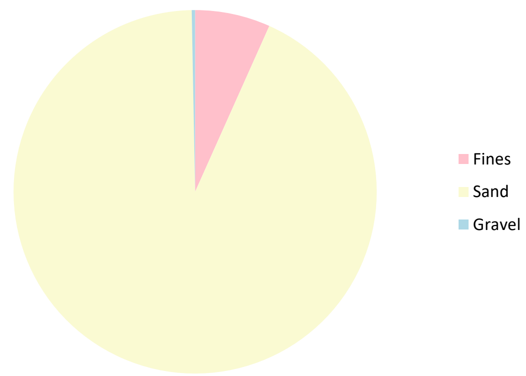
11745 ENV3

Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.00	0.00	
4000.00	-2.00	0.20	0.20	
2828.43	-1.50	0.03	0.23	Granule
2000.00	-1.00	0.03	0.26	
1414.21	-0.50	0.07	0.33	Very coarse sand
1000.00	0.00	0.19	0.52	
707.11	0.50	4.38	4.90	Coarse sand
500.00	1.00	10.64	15.54	
353.55	1.50	20.70	36.24	Medium sand
250.00	2.00	27.70	63.94	
176.78	2.50	19.78	83.71	Fine sand
125.00	3.00	6.84	90.56	
88.39	3.50	1.99	92.54	Very fine sand
62.50	4.00	0.73	93.27	
44.19	4.50	0.62	93.89	Coarse silt
31.25	5.00	0.63	94.52	
22.10	5.50	0.65	95.17	Medium silt
15.63	6.00	0.70	95.87	
11.05	6.50	0.78	96.65	Fine silt
7.81	7.00	0.75	97.40	
5.52	7.50	0.65	98.05	Very fine silt
3.91	8.00	0.49	98.55	
2.76	8.50	0.32	98.86	Clay
1.95	9.00	0.20	99.06	
1.38	9.50	0.16	99.22	
0.98	10.00	0.16	99.38	
0.69	10.50	0.14	99.52	
0.49	11.00	0.12	99.64	
0.35	11.50	0.10	99.75	
<0.35	>11.5	0.25	100.00	



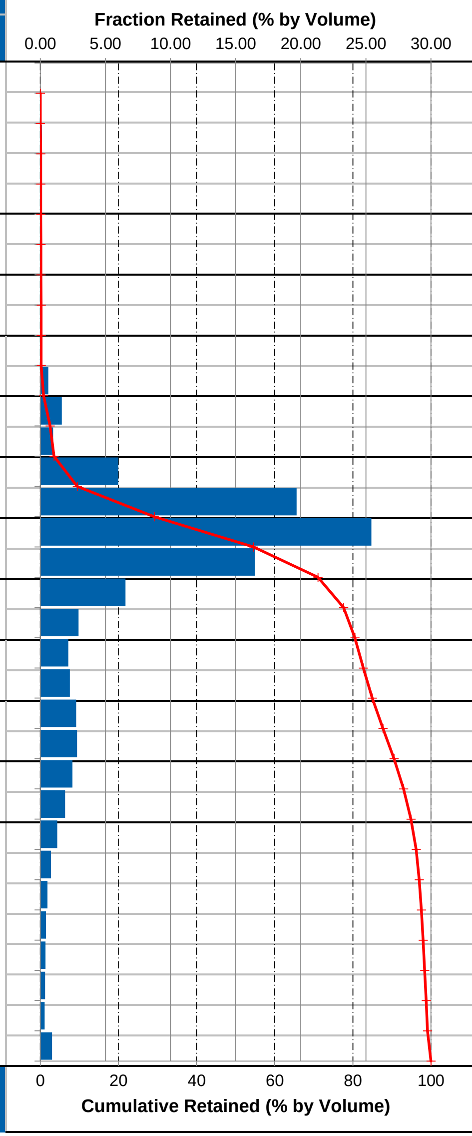
Method of Moments			
Geometric	Mean (µm)	247.79	Wentworth:
Logarithmic	Mean (Phi)	2.01	Fine sand
	Sorting	1.56	Poor
	Skewness	2.99	Very fine
	Kurtosis	15.33	Very leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	295.23	Wentworth:
Logarithmic	Mean (Phi)	1.76	Medium sand
	Sorting	1.11	Poor
	Skewness	0.26	Fine
	Kurtosis	1.90	Very leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	1.75	297.64	Medium sand
1st Local Maxima (Mode)	2.00	250.00	Medium sand
2nd Local Maxima	-	-	-
3rd Local Maxima	-	-	-

Classification		Composition	
Modified Folk	Sand	Fines	6.70%
EUNIS Folk	Sand and muddy sand	Sand	93.00%
Distribution	Unimodal	Gravel	0.30%



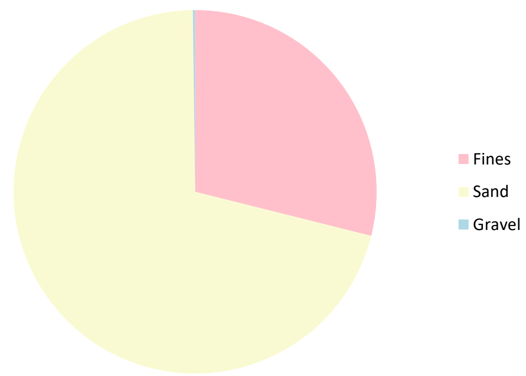
APPENDIX D PARTICLE SIZE ANALYSIS

11745 ENV4				
Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.12	0.12	
5656.85	-2.50	0.00	0.12	
4000.00	-2.00	0.01	0.13	
2828.43	-1.50	0.03	0.16	Granule
2000.00	-1.00	0.01	0.18	
1414.21	-0.50	0.04	0.22	Very coarse sand
1000.00	0.00	0.02	0.24	
707.11	0.50	0.00	0.24	Coarse sand
500.00	1.00	0.61	0.85	
353.55	1.50	1.66	2.50	Medium sand
250.00	2.00	0.99	3.49	
176.78	2.50	5.99	9.48	Fine sand
125.00	3.00	19.69	29.16	
88.39	3.50	25.42	54.58	Very fine sand
62.50	4.00	16.48	71.07	
44.19	4.50	6.55	77.61	Coarse silt
31.25	5.00	2.93	80.54	
22.10	5.50	2.15	82.69	Medium silt
15.63	6.00	2.26	84.95	
11.05	6.50	2.75	87.70	Fine silt
7.81	7.00	2.81	90.52	
5.52	7.50	2.47	92.99	Very fine silt
3.91	8.00	1.91	94.90	
2.76	8.50	1.30	96.19	Clay
1.95	9.00	0.82	97.01	
1.38	9.50	0.55	97.56	
0.98	10.00	0.44	97.99	
0.69	10.50	0.40	98.39	
0.49	11.00	0.37	98.76	
0.35	11.50	0.34	99.10	
<0.35	>11.5	0.90	100.00	



Method of Moments			
Geometric	Mean (µm)	62.12	Wentworth:
Logarithmic	Mean (Phi)	4.01	Coarse silt
	Sorting	1.96	Poor
	Skewness	1.74	Very fine
	Kurtosis	7.00	Leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	64.48	Wentworth:
Logarithmic	Mean (Phi)	3.95	Very fine sand
	Sorting	1.68	Poor
	Skewness	0.54	Very fine
	Kurtosis	1.72	Very leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	3.41	94.09	Very fine sand
1st Local Maxima (Mode)	3.50	88.39	Very fine sand
2nd Local Maxima	7.00	7.81	Fine silt
3rd Local Maxima	1.50	353.55	Medium sand

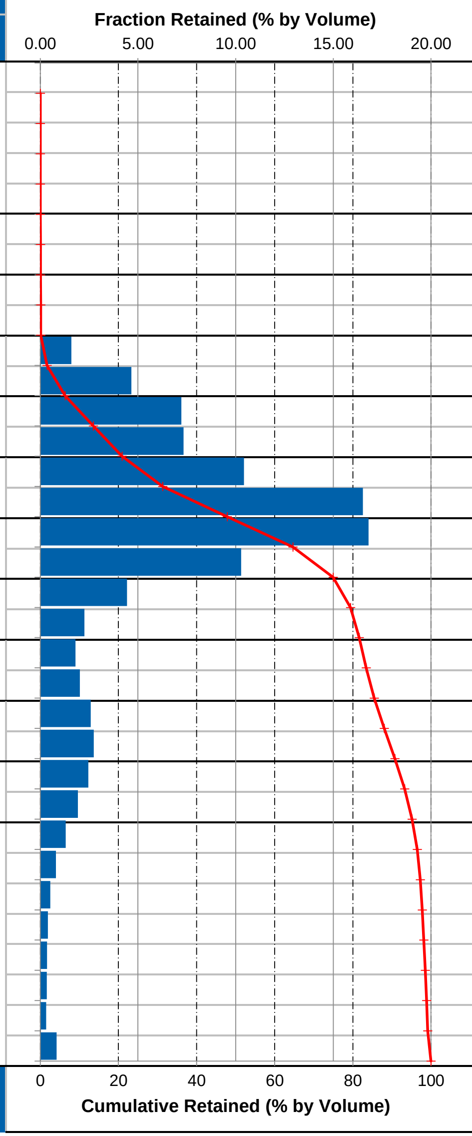
Classification		Composition	
Modified Folk	Muddy sand	Fines	28.90%
EUNIS Folk	Mud and sandy mud	Sand	70.90%
Distribution	Multimodal	Gravel	0.20%



APPENDIX D PARTICLE SIZE ANALYSIS

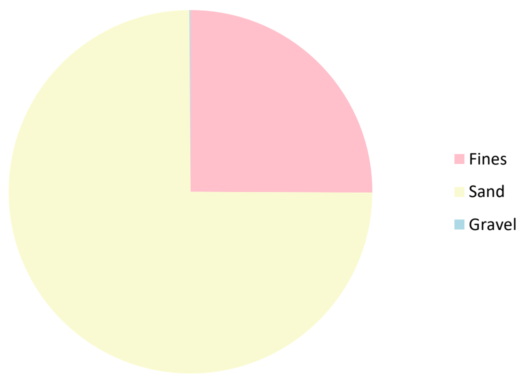
11745 ENV5

Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.00	0.00	
4000.00	-2.00	0.00	0.00	
2828.43	-1.50	0.03	0.03	Granule
2000.00	-1.00	0.03	0.07	
1414.21	-0.50	0.02	0.09	Very coarse sand
1000.00	0.00	0.01	0.10	
707.11	0.50	1.59	1.70	Coarse sand
500.00	1.00	4.66	6.35	
353.55	1.50	7.22	13.57	Medium sand
250.00	2.00	7.33	20.90	
176.78	2.50	10.43	31.33	Fine sand
125.00	3.00	16.52	47.85	
88.39	3.50	16.81	64.65	Very fine sand
62.50	4.00	10.28	74.94	
44.19	4.50	4.44	79.38	Coarse silt
31.25	5.00	2.26	81.64	
22.10	5.50	1.80	83.44	Medium silt
15.63	6.00	2.03	85.47	
11.05	6.50	2.58	88.05	Fine silt
7.81	7.00	2.73	90.79	
5.52	7.50	2.46	93.24	Very fine silt
3.91	8.00	1.93	95.17	
2.76	8.50	1.31	96.47	Clay
1.95	9.00	0.80	97.28	
1.38	9.50	0.51	97.79	
0.98	10.00	0.39	98.18	
0.69	10.50	0.35	98.53	
0.49	11.00	0.33	98.86	
0.35	11.50	0.30	99.16	
<0.35	>11.5	0.84	100.00	



Method of Moments			
Geometric	Mean (µm)	86.54	Wentworth:
Logarithmic	Mean (Phi)	3.53	Very fine sand
	Sorting	2.20	Very poor
	Skewness	1.45	Very fine
	Kurtosis	5.54	Leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	91.14	Wentworth:
Logarithmic	Mean (Phi)	3.46	Very fine sand
	Sorting	2.07	Very poor
	Skewness	0.34	Very fine
	Kurtosis	1.61	Very leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	3.06	119.57	Very fine sand
1st Local Maxima (Mode)	3.50	88.39	Very fine sand
2nd Local Maxima	7.00	7.81	Fine silt
3rd Local Maxima	-	-	-

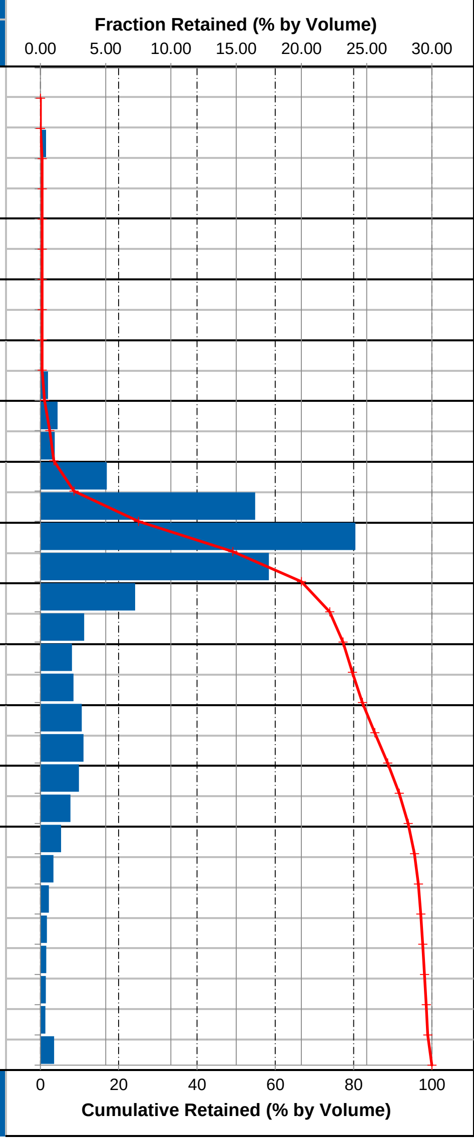
Classification		Composition	
Modified Folk	Muddy sand	Fines	25.10%
EUNIS Folk	Mud and sandy mud	Sand	74.90%
Distribution	Bimodal	Gravel	0.10%



APPENDIX D PARTICLE SIZE ANALYSIS

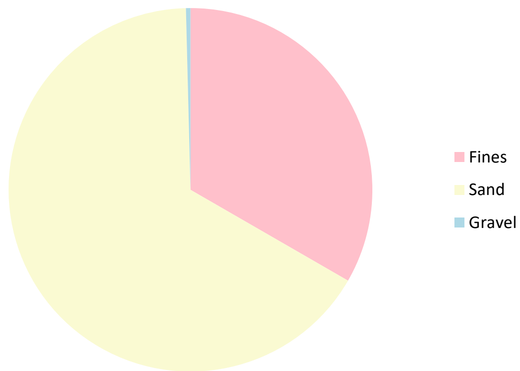
11745 ENV6

Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.43	0.43	
5656.85	-2.50	0.00	0.43	
4000.00	-2.00	0.00	0.43	
2828.43	-1.50	0.00	0.43	Granule
2000.00	-1.00	0.01	0.43	
1414.21	-0.50	0.02	0.45	Very coarse sand
1000.00	0.00	0.00	0.45	
707.11	0.50	0.01	0.46	Coarse sand
500.00	1.00	0.59	1.05	
353.55	1.50	1.31	2.36	Medium sand
250.00	2.00	1.10	3.46	
176.78	2.50	5.10	8.55	Fine sand
125.00	3.00	16.46	25.01	
88.39	3.50	24.14	49.16	Very fine sand
62.50	4.00	17.51	66.66	
44.19	4.50	7.26	73.92	Coarse silt
31.25	5.00	3.35	77.28	
22.10	5.50	2.41	79.69	Medium silt
15.63	6.00	2.54	82.23	
11.05	6.50	3.17	85.40	Fine silt
7.81	7.00	3.31	88.70	
5.52	7.50	2.95	91.65	Very fine silt
3.91	8.00	2.31	93.96	
2.76	8.50	1.58	95.54	Clay
1.95	9.00	0.99	96.53	
1.38	9.50	0.65	97.18	
0.98	10.00	0.50	97.68	
0.69	10.50	0.45	98.13	
0.49	11.00	0.42	98.56	
0.35	11.50	0.39	98.94	
<0.35	>11.5	1.06	100.00	



Method of Moments			
Geometric	Mean (µm)	55.11	Wentworth:
Logarithmic	Mean (Phi)	4.18	Coarse silt
	Sorting	2.08	Very poor
	Skewness	1.40	Very fine
	Kurtosis	6.24	Leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	55.30	Wentworth:
Logarithmic	Mean (Phi)	4.18	Coarse silt
	Sorting	1.82	Poor
	Skewness	0.55	Very fine
	Kurtosis	1.52	Very leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	3.52	86.93	Very fine sand
1st Local Maxima (Mode)	3.50	88.39	Very fine sand
2nd Local Maxima	7.00	7.81	Fine silt
3rd Local Maxima	1.50	353.55	Medium sand

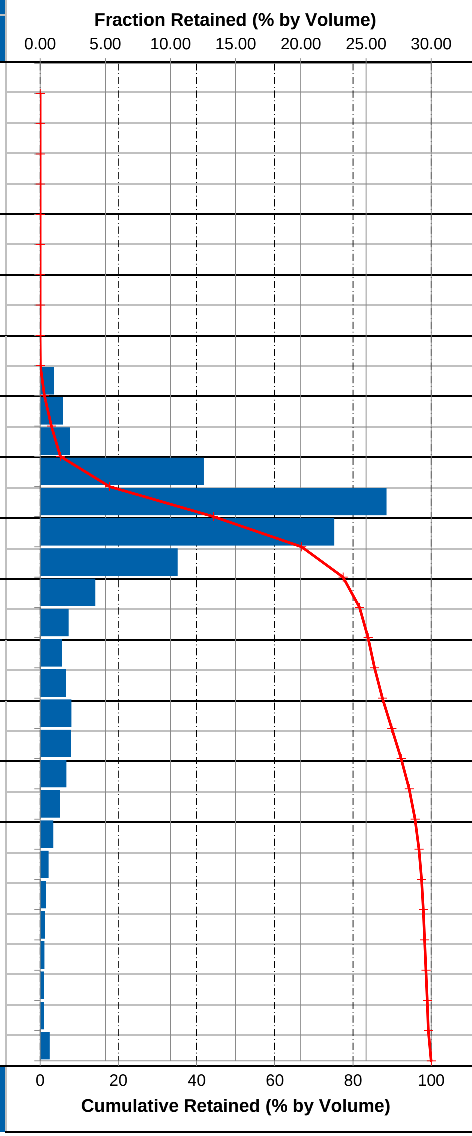
Classification		Composition	
Modified Folk	Muddy sand	Fines	33.30%
EUNIS Folk	Mud and sandy mud	Sand	66.20%
Distribution	Multimodal	Gravel	0.40%



APPENDIX D PARTICLE SIZE ANALYSIS

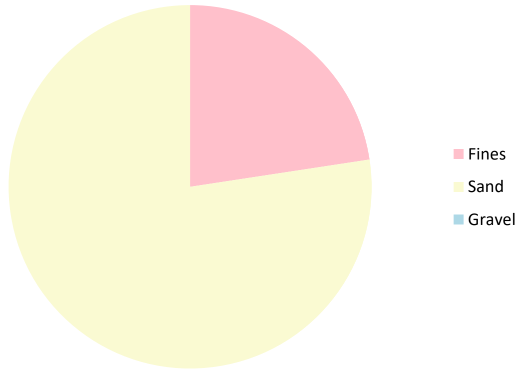
11745 ENV14

Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.00	0.00	
4000.00	-2.00	0.00	0.00	
2828.43	-1.50	0.00	0.00	Granule
2000.00	-1.00	0.00	0.00	
1414.21	-0.50	0.00	0.00	Very coarse sand
1000.00	0.00	0.01	0.01	
707.11	0.50	0.04	0.05	Coarse sand
500.00	1.00	1.06	1.10	
353.55	1.50	1.77	2.88	Medium sand
250.00	2.00	2.31	5.19	
176.78	2.50	12.56	17.74	Fine sand
125.00	3.00	26.58	44.32	
88.39	3.50	22.57	66.89	Very fine sand
62.50	4.00	10.55	77.43	
44.19	4.50	4.25	81.68	Coarse silt
31.25	5.00	2.19	83.87	
22.10	5.50	1.69	85.55	Medium silt
15.63	6.00	1.98	87.54	
11.05	6.50	2.41	89.95	Fine silt
7.81	7.00	2.38	92.33	
5.52	7.50	2.02	94.35	Very fine silt
3.91	8.00	1.52	95.88	
2.76	8.50	1.02	96.90	Clay
1.95	9.00	0.65	97.55	
1.38	9.50	0.45	98.00	
0.98	10.00	0.36	98.35	
0.69	10.50	0.32	98.68	
0.49	11.00	0.30	98.98	
0.35	11.50	0.28	99.26	
<0.35	>11.5	0.74	100.00	



Method of Moments			
Geometric	Mean (µm)	77.88	Wentworth:
Logarithmic	Mean (Phi)	3.68	Very fine sand
	Sorting	1.88	Poor
	Skewness	2.04	Very fine
	Kurtosis	7.86	Very leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	86.44	Wentworth:
Logarithmic	Mean (Phi)	3.53	Very fine sand
	Sorting	1.52	Poor
	Skewness	0.53	Very fine
	Kurtosis	1.89	Very leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	3.13	114.56	Very fine sand
1st Local Maxima (Mode)	3.00	125.00	Fine sand
2nd Local Maxima	6.50	11.05	Fine silt
3rd Local Maxima	-	-	-

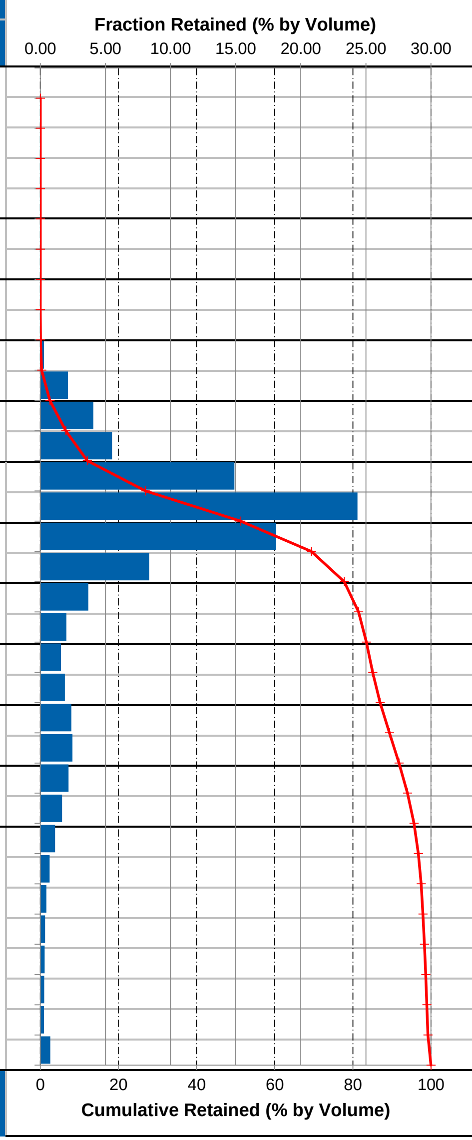
Classification		Composition	
Modified Folk	Muddy sand	Fines	22.60%
EUNIS Folk	Mud and sandy mud	Sand	77.40%
Distribution	Bimodal	Gravel	0.00%



APPENDIX D PARTICLE SIZE ANALYSIS

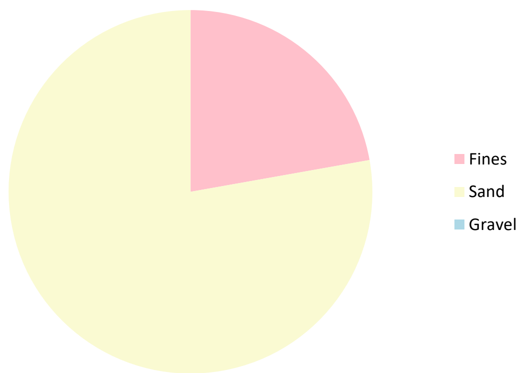
11745 ENV16

Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.00	0.00	
4000.00	-2.00	0.00	0.00	
2828.43	-1.50	0.00	0.00	Granule
2000.00	-1.00	0.00	0.00	
1414.21	-0.50	0.01	0.01	Very coarse sand
1000.00	0.00	0.03	0.04	
707.11	0.50	0.29	0.33	Coarse sand
500.00	1.00	2.13	2.46	
353.55	1.50	4.07	6.53	Medium sand
250.00	2.00	5.51	12.04	
176.78	2.50	14.91	26.95	Fine sand
125.00	3.00	24.36	51.31	
88.39	3.50	18.11	69.42	Very fine sand
62.50	4.00	8.37	77.78	
44.19	4.50	3.69	81.47	Coarse silt
31.25	5.00	2.00	83.47	
22.10	5.50	1.59	85.06	Medium silt
15.63	6.00	1.88	86.95	
11.05	6.50	2.39	89.34	Fine silt
7.81	7.00	2.47	91.81	
5.52	7.50	2.17	93.98	Very fine silt
3.91	8.00	1.67	95.65	
2.76	8.50	1.13	96.78	Clay
1.95	9.00	0.71	97.49	
1.38	9.50	0.47	97.95	
0.98	10.00	0.36	98.32	
0.69	10.50	0.33	98.64	
0.49	11.00	0.31	98.95	
0.35	11.50	0.28	99.23	
<0.35	>11.5	0.77	100.00	



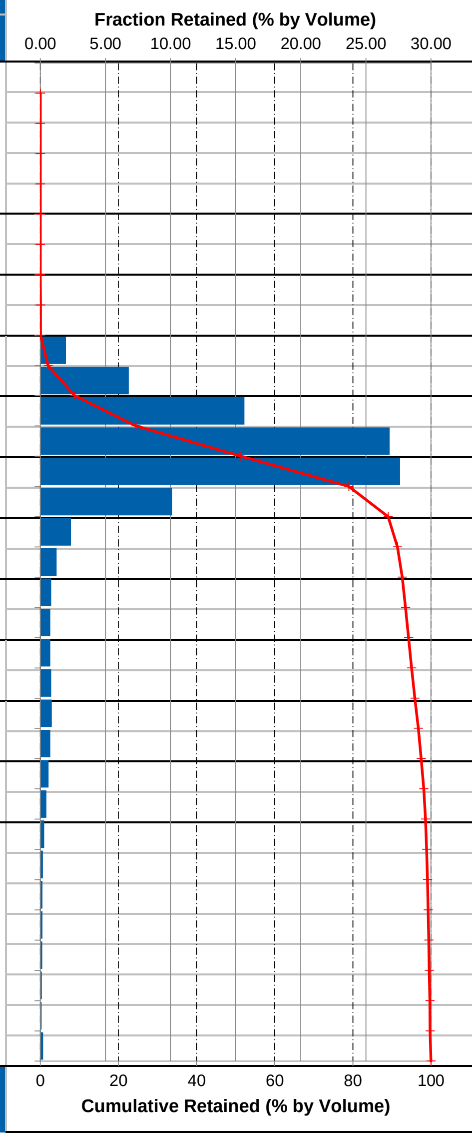
Method of Moments			
Geometric	Mean (µm)	85.65	Wentworth:
Logarithmic	Mean (Phi)	3.55	Very fine sand
	Sorting	2.01	Very poor
	Skewness	1.83	Very fine
	Kurtosis	6.92	Leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	93.18	Wentworth:
Logarithmic	Mean (Phi)	3.42	Very fine sand
	Sorting	1.74	Poor
	Skewness	0.47	Very fine
	Kurtosis	1.90	Very leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	2.97	127.35	Fine sand
1st Local Maxima (Mode)	3.00	125.00	Fine sand
2nd Local Maxima	7.00	7.81	Fine silt
3rd Local Maxima	-	-	-

Classification		Composition	
Modified Folk	Muddy sand	Fines	22.20%
EUNIS Folk	Mud and sandy mud	Sand	77.80%
Distribution	Bimodal	Gravel	0.00%



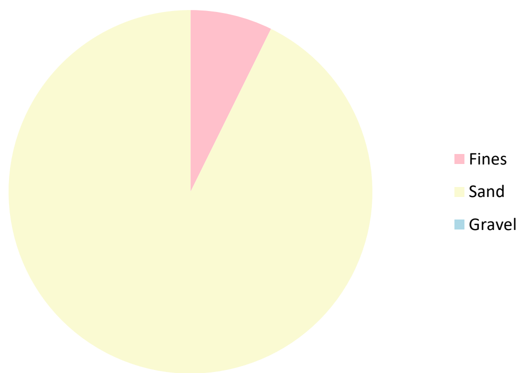
APPENDIX D PARTICLE SIZE ANALYSIS

11745 ENV17				
Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.00	0.00	
4000.00	-2.00	0.00	0.00	
2828.43	-1.50	0.00	0.00	Granule
2000.00	-1.00	0.01	0.01	
1414.21	-0.50	0.01	0.02	Very coarse sand
1000.00	0.00	0.01	0.04	
707.11	0.50	1.98	2.01	Coarse sand
500.00	1.00	6.79	8.80	
353.55	1.50	15.67	24.47	Medium sand
250.00	2.00	26.83	51.31	
176.78	2.50	27.64	78.94	Fine sand
125.00	3.00	10.12	89.06	
88.39	3.50	2.36	91.42	Very fine sand
62.50	4.00	1.25	92.67	
44.19	4.50	0.83	93.51	Coarse silt
31.25	5.00	0.76	94.27	
22.10	5.50	0.77	95.04	Medium silt
15.63	6.00	0.83	95.87	
11.05	6.50	0.88	96.75	Fine silt
7.81	7.00	0.77	97.51	
5.52	7.50	0.63	98.14	Very fine silt
3.91	8.00	0.47	98.61	
2.76	8.50	0.30	98.91	Clay
1.95	9.00	0.19	99.10	
1.38	9.50	0.17	99.27	
0.98	10.00	0.16	99.43	
0.69	10.50	0.14	99.58	
0.49	11.00	0.12	99.69	
0.35	11.50	0.09	99.79	
<0.35	>11.5	0.21	100.00	



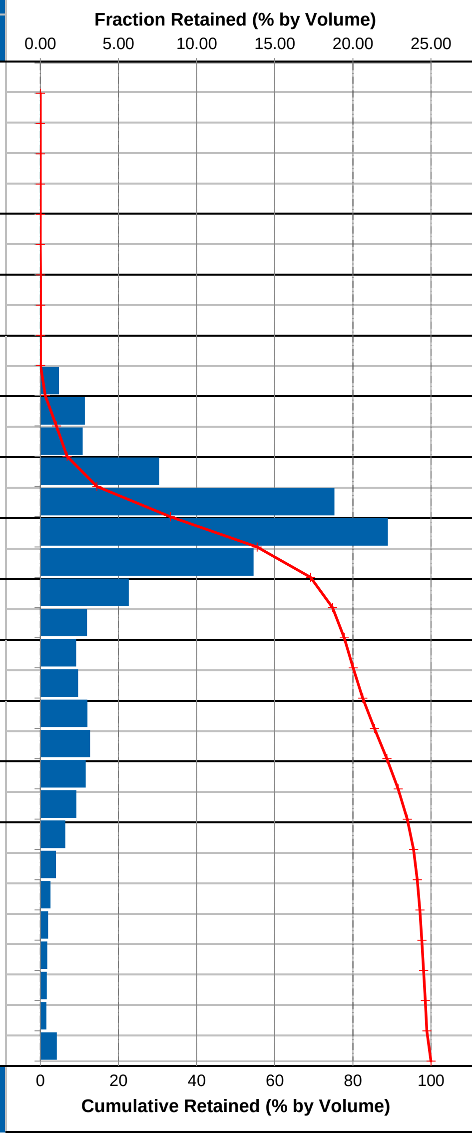
Method of Moments			
Geometric	Mean (µm)	213.11	Wentworth:
Logarithmic	Mean (Phi)	2.23	Fine sand
	Sorting	1.49	Poor
	Skewness	3.04	Very fine
	Kurtosis	15.38	Very leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	252.60	Wentworth:
Logarithmic	Mean (Phi)	1.99	Medium sand
	Sorting	1.10	Poor
	Skewness	0.25	Fine
	Kurtosis	2.12	Very leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	1.98	254.25	Medium sand
1st Local Maxima (Mode)	2.50	176.78	Fine sand
2nd Local Maxima	-	-	-
3rd Local Maxima	-	-	-

Classification		Composition	
Modified Folk	Sand	Fines	7.30%
EUNIS Folk	Sand and muddy sand	Sand	92.70%
Distribution	Unimodal	Gravel	0.00%



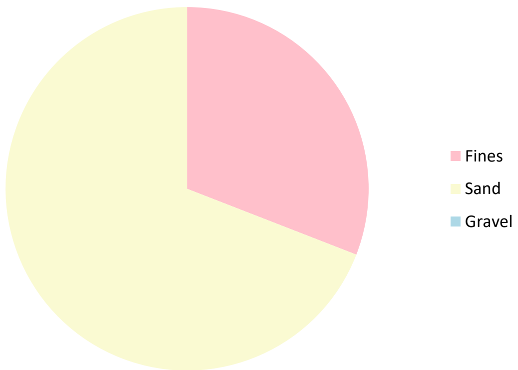
APPENDIX D PARTICLE SIZE ANALYSIS

11745 ENV18				
Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.00	0.00	
4000.00	-2.00	0.00	0.00	
2828.43	-1.50	0.02	0.02	Granule
2000.00	-1.00	0.01	0.03	
1414.21	-0.50	0.01	0.03	Very coarse sand
1000.00	0.00	0.01	0.04	
707.11	0.50	0.02	0.06	Coarse sand
500.00	1.00	1.20	1.26	
353.55	1.50	2.86	4.12	Medium sand
250.00	2.00	2.71	6.83	
176.78	2.50	7.61	14.44	Fine sand
125.00	3.00	18.82	33.25	
88.39	3.50	22.25	55.50	Very fine sand
62.50	4.00	13.64	69.14	
44.19	4.50	5.66	74.80	Coarse silt
31.25	5.00	2.99	77.80	
22.10	5.50	2.29	80.09	Medium silt
15.63	6.00	2.42	82.51	
11.05	6.50	3.01	85.52	Fine silt
7.81	7.00	3.19	88.71	
5.52	7.50	2.90	91.62	Very fine silt
3.91	8.00	2.31	93.93	
2.76	8.50	1.59	95.52	Clay
1.95	9.00	1.00	96.52	
1.38	9.50	0.65	97.17	
0.98	10.00	0.50	97.68	
0.69	10.50	0.45	98.13	
0.49	11.00	0.42	98.55	
0.35	11.50	0.39	98.94	
<0.35	>11.5	1.06	100.00	



Method of Moments			
Geometric	Mean (µm)	60.53	Wentworth:
Logarithmic	Mean (Phi)	4.05	Coarse silt
	Sorting	2.12	Very poor
	Skewness	1.58	Very fine
	Kurtosis	5.71	Leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	60.16	Wentworth:
Logarithmic	Mean (Phi)	4.06	Coarse silt
	Sorting	1.94	Poor
	Skewness	0.52	Very fine
	Kurtosis	1.56	Very leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	3.38	96.29	Very fine sand
1st Local Maxima (Mode)	3.50	88.39	Very fine sand
2nd Local Maxima	7.00	7.81	Fine silt
3rd Local Maxima	1.50	353.55	Medium sand

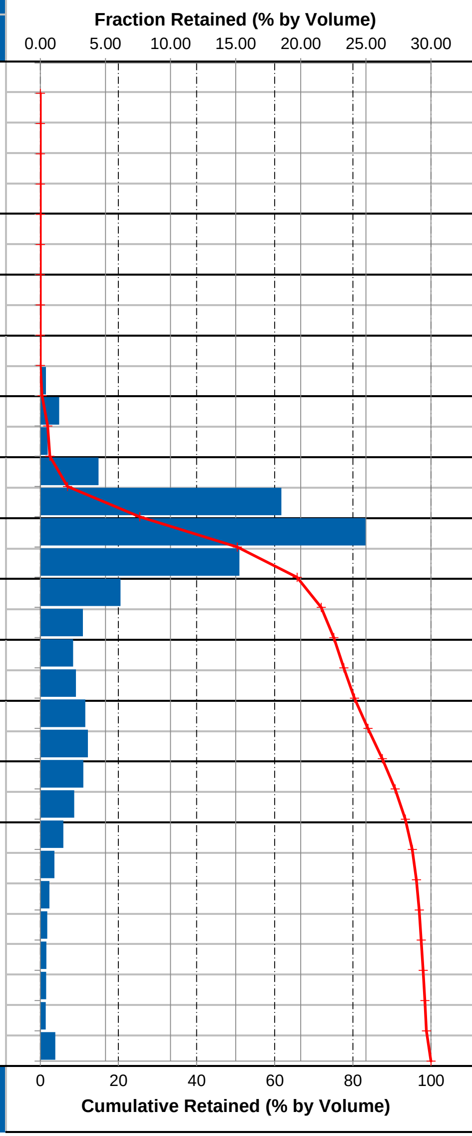
Classification		Composition	
Modified Folk	Muddy sand	Fines	30.90%
EUNIS Folk	Mud and sandy mud	Sand	69.10%
Distribution	Multimodal	Gravel	0.00%



APPENDIX D PARTICLE SIZE ANALYSIS

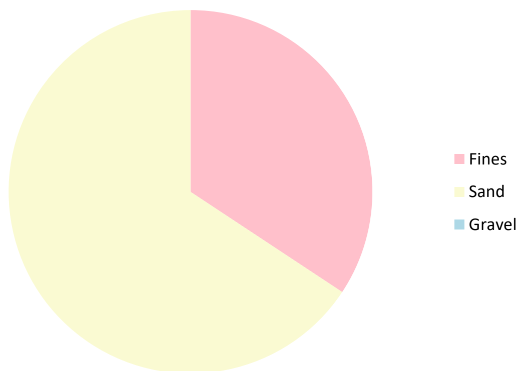
11746 ENV1

Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.00	0.00	
4000.00	-2.00	0.00	0.00	
2828.43	-1.50	0.00	0.00	Granule
2000.00	-1.00	0.00	0.00	
1414.21	-0.50	0.00	0.00	Very coarse sand
1000.00	0.00	0.01	0.01	
707.11	0.50	0.00	0.01	Coarse sand
500.00	1.00	0.44	0.45	
353.55	1.50	1.45	1.90	Medium sand
250.00	2.00	0.57	2.47	
176.78	2.50	4.47	6.94	Fine sand
125.00	3.00	18.51	25.45	
88.39	3.50	24.98	50.43	Very fine sand
62.50	4.00	15.29	65.72	
44.19	4.50	6.16	71.87	Coarse silt
31.25	5.00	3.27	75.14	
22.10	5.50	2.51	77.66	Medium silt
15.63	6.00	2.74	80.39	
11.05	6.50	3.46	83.85	Fine silt
7.81	7.00	3.66	87.51	
5.52	7.50	3.31	90.82	Very fine silt
3.91	8.00	2.61	93.43	
2.76	8.50	1.77	95.20	Clay
1.95	9.00	1.09	96.29	
1.38	9.50	0.70	96.99	
0.98	10.00	0.53	97.52	
0.69	10.50	0.47	97.99	
0.49	11.00	0.45	98.44	
0.35	11.50	0.41	98.85	
<0.35	>11.5	1.15	100.00	



Method of Moments			
Geometric	Mean (µm)	51.43	Wentworth:
Logarithmic	Mean (Phi)	4.28	Coarse silt
	Sorting	2.09	Very poor
	Skewness	1.60	Very fine
	Kurtosis	5.61	Leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	52.48	Wentworth:
Logarithmic	Mean (Phi)	4.25	Coarse silt
	Sorting	1.88	Poor
	Skewness	0.61	Very fine
	Kurtosis	1.27	Leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	3.49	88.91	Very fine sand
1st Local Maxima (Mode)	3.50	88.39	Very fine sand
2nd Local Maxima	7.00	7.81	Fine silt
3rd Local Maxima	1.50	353.55	Medium sand

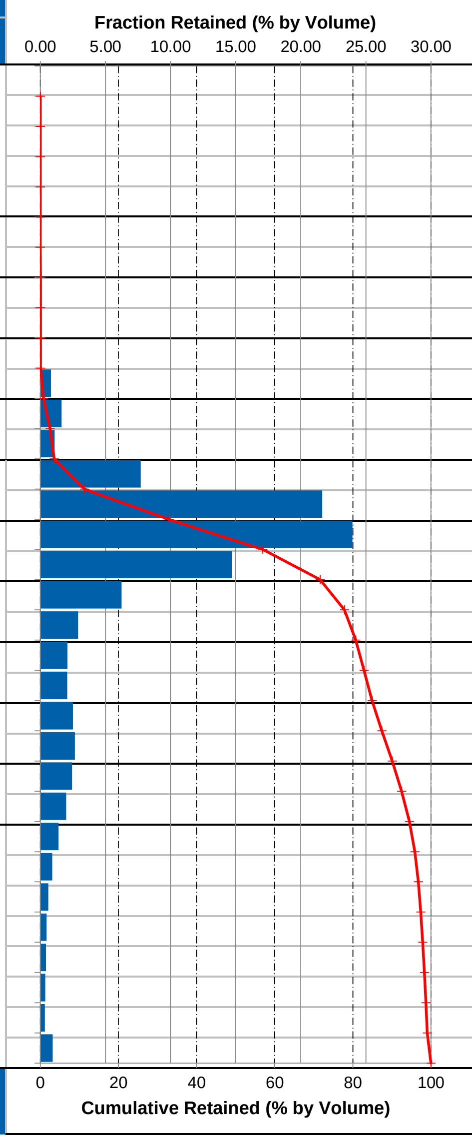
Classification		Composition	
Modified Folk	Muddy sand	Fines	34.30%
EUNIS Folk	Mud and sandy mud	Sand	65.70%
Distribution	Multimodal	Gravel	0.00%



APPENDIX D PARTICLE SIZE ANALYSIS

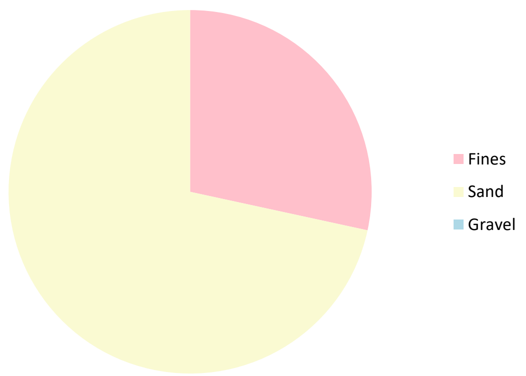
11746 ENV3

Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.00	0.00	
4000.00	-2.00	0.00	0.00	
2828.43	-1.50	0.02	0.02	Granule
2000.00	-1.00	0.01	0.02	
1414.21	-0.50	0.00	0.02	Very coarse sand
1000.00	0.00	0.00	0.02	
707.11	0.50	0.01	0.04	Coarse sand
500.00	1.00	0.81	0.85	
353.55	1.50	1.64	2.48	Medium sand
250.00	2.00	1.09	3.58	
176.78	2.50	7.72	11.29	Fine sand
125.00	3.00	21.64	32.94	
88.39	3.50	23.97	56.91	Very fine sand
62.50	4.00	14.71	71.62	
44.19	4.50	6.24	77.86	Coarse silt
31.25	5.00	2.90	80.76	
22.10	5.50	2.09	82.85	Medium silt
15.63	6.00	2.08	84.93	
11.05	6.50	2.50	87.42	Fine silt
7.81	7.00	2.64	90.07	
5.52	7.50	2.44	92.50	Very fine silt
3.91	8.00	1.98	94.48	
2.76	8.50	1.40	95.88	Clay
1.95	9.00	0.91	96.79	
1.38	9.50	0.62	97.41	
0.98	10.00	0.48	97.89	
0.69	10.50	0.42	98.32	
0.49	11.00	0.39	98.71	
0.35	11.50	0.35	99.06	
<0.35	>11.5	0.94	100.00	



Method of Moments			
Geometric	Mean (µm)	63.24	Wentworth:
Logarithmic	Mean (Phi)	3.98	Very fine sand
	Sorting	1.99	Poor
	Skewness	1.84	Very fine
	Kurtosis	6.78	Leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	66.34	Wentworth:
Logarithmic	Mean (Phi)	3.91	Very fine sand
	Sorting	1.72	Poor
	Skewness	0.56	Very fine
	Kurtosis	1.72	Very leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	3.36	97.67	Very fine sand
1st Local Maxima (Mode)	3.50	88.39	Very fine sand
2nd Local Maxima	7.00	7.81	Fine silt
3rd Local Maxima	1.50	353.55	Medium sand

Classification		Composition	
Modified Folk	Muddy sand	Fines	28.40%
EUNIS Folk	Mud and sandy mud	Sand	71.60%
Distribution	Multimodal	Gravel	0.00%

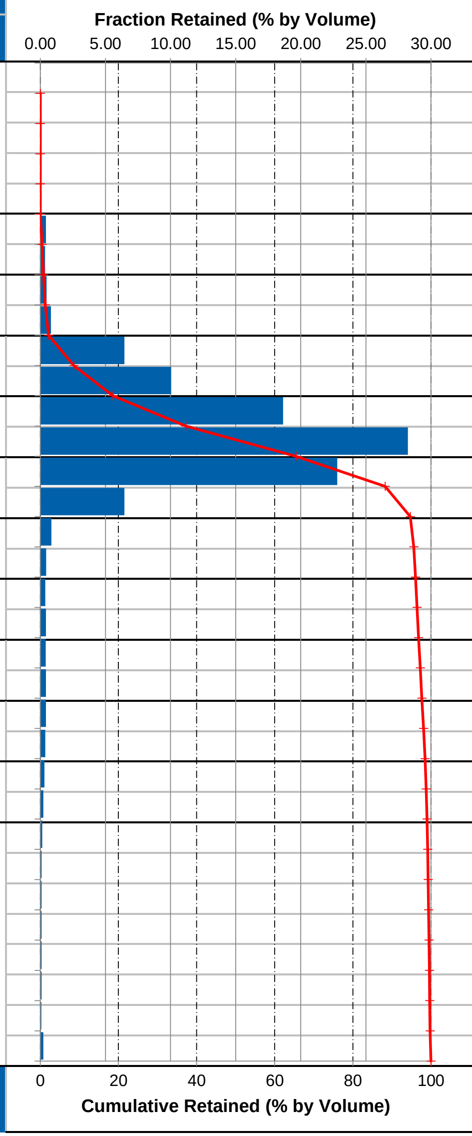


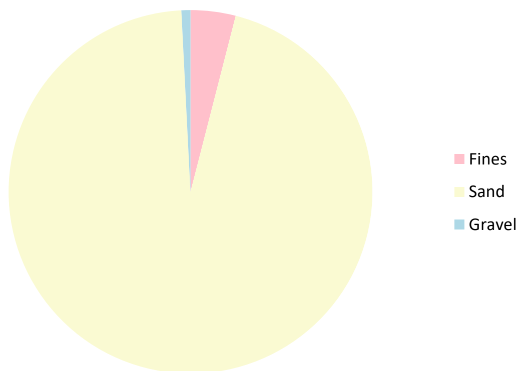
APPENDIX D PARTICLE SIZE ANALYSIS

11746 ENV4				
Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.00	0.00	
4000.00	-2.00	0.00	0.00	
2828.43	-1.50	0.44	0.44	Granule
2000.00	-1.00	0.36	0.80	
1414.21	-0.50	0.48	1.28	Very coarse sand
1000.00	0.00	0.81	2.09	
707.11	0.50	6.47	8.56	Coarse sand
500.00	1.00	10.04	18.60	
353.55	1.50	18.65	37.24	Medium sand
250.00	2.00	28.22	65.47	
176.78	2.50	22.80	88.27	Fine sand
125.00	3.00	6.46	94.73	
88.39	3.50	0.86	95.59	Very fine sand
62.50	4.00	0.45	96.04	
44.19	4.50	0.37	96.41	Coarse silt
31.25	5.00	0.42	96.84	
22.10	5.50	0.42	97.25	Medium silt
15.63	6.00	0.43	97.68	
11.05	6.50	0.43	98.11	Fine silt
7.81	7.00	0.38	98.49	
5.52	7.50	0.31	98.80	Very fine silt
3.91	8.00	0.22	99.02	
2.76	8.50	0.15	99.17	Clay
1.95	9.00	0.10	99.27	
1.38	9.50	0.10	99.37	
0.98	10.00	0.11	99.48	
0.69	10.50	0.11	99.58	
0.49	11.00	0.10	99.68	
0.35	11.50	0.09	99.77	
<0.35	>11.5	0.23	100.00	

Method of Moments			
Geometric	Mean (µm)	284.89	Wentworth:
Logarithmic	Mean (Phi)	1.81	Medium sand
	Sorting	1.37	Poor
	Skewness	3.22	Very fine
	Kurtosis	21.34	Very leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	314.76	Wentworth:
Logarithmic	Mean (Phi)	1.67	Medium sand
	Sorting	0.83	Moderate
	Skewness	-0.07	Symmetrical
	Kurtosis	1.16	Leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	1.73	302.29	Medium sand
1st Local Maxima (Mode)	2.00	250.00	Medium sand
2nd Local Maxima	-	-	-
3rd Local Maxima	-	-	-

Classification		Composition	
Modified Folk	Sand	Fines	4.00%
EUNIS Folk	Sand and muddy sand	Sand	95.20%
Distribution	Unimodal	Gravel	0.80%

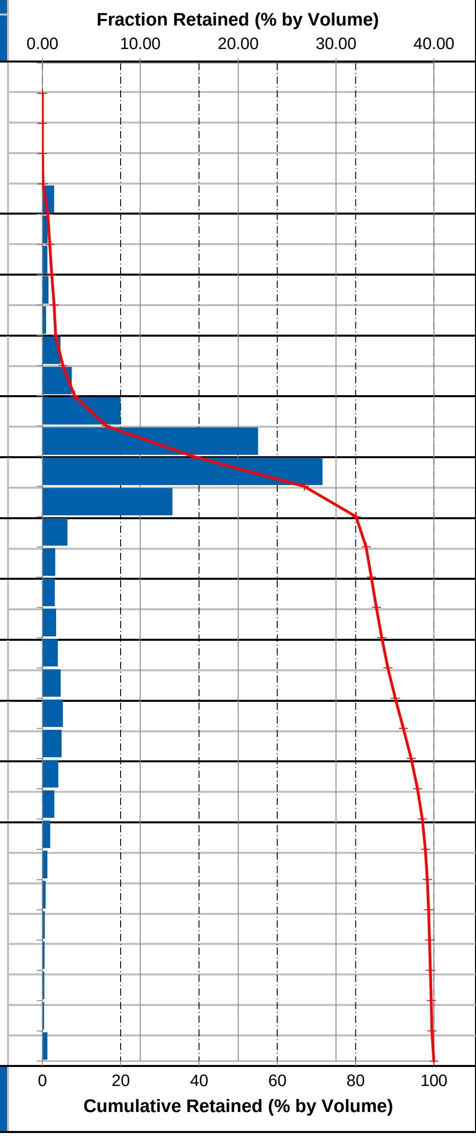




APPENDIX D PARTICLE SIZE ANALYSIS

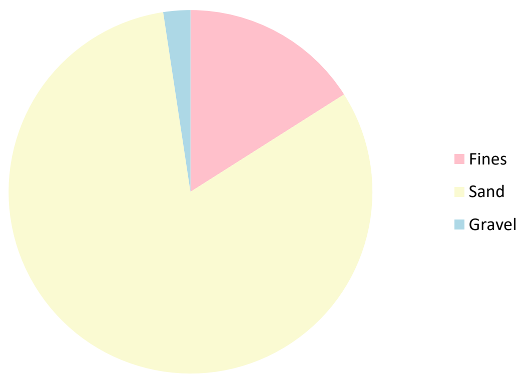
11746 ENV5

Aperature (µm)	Aperature (Phi)	Percentage Fraction	Cumulative Percentage	Sediment Description
16000.00	-4.00	0.00	0.00	Pebble
11313.71	-3.50	0.00	0.00	
8000.00	-3.00	0.00	0.00	
5656.85	-2.50	0.18	0.18	
4000.00	-2.00	1.19	1.37	
2828.43	-1.50	0.53	1.90	Granule
2000.00	-1.00	0.50	2.40	
1414.21	-0.50	0.63	3.03	Very coarse sand
1000.00	0.00	0.37	3.40	
707.11	0.50	1.85	5.24	Coarse sand
500.00	1.00	3.00	8.24	
353.55	1.50	7.98	16.23	Medium sand
250.00	2.00	22.03	38.25	
176.78	2.50	28.61	66.87	Fine sand
125.00	3.00	13.28	80.15	
88.39	3.50	2.56	82.71	Very fine sand
62.50	4.00	1.32	84.03	
44.19	4.50	1.26	85.28	Coarse silt
31.25	5.00	1.41	86.69	
22.10	5.50	1.58	88.27	Medium silt
15.63	6.00	1.86	90.13	
11.05	6.50	2.09	92.22	Fine silt
7.81	7.00	1.97	94.19	
5.52	7.50	1.63	95.82	Very fine silt
3.91	8.00	1.21	97.03	
2.76	8.50	0.81	97.84	Clay
1.95	9.00	0.50	98.34	
1.38	9.50	0.32	98.66	
0.98	10.00	0.24	98.91	
0.69	10.50	0.21	99.12	
0.49	11.00	0.20	99.32	
0.35	11.50	0.18	99.50	
<0.35	>11.5	0.50	100.00	



Method of Moments			
Geometric	Mean (µm)	156.38	Wentworth:
Logarithmic	Mean (Phi)	2.68	Fine sand
	Sorting	2.11	Very poor
	Skewness	1.58	Very fine
	Kurtosis	7.04	Leptokurtic
Graphic Folk and Ward			
Geometric	Mean (µm)	169.54	Wentworth:
Logarithmic	Mean (Phi)	2.56	Fine sand
	Sorting	1.66	Poor
	Skewness	0.45	Very fine
	Kurtosis	2.52	Very leptokurtic
Other Statistics	Phi (φ)	µm	Wentworth:
Median (D50)	2.21	216.85	Fine sand
1st Local Maxima (Mode)	2.50	176.78	Fine sand
2nd Local Maxima	6.50	11.05	Fine silt
3rd Local Maxima	-2.00	4000.00	Pebble

Classification		Composition	
Modified Folk	lightly gravelly muddy sar	Fines	16.00%
EUNIS Folk	Sand and muddy sand	Sand	81.60%
Distribution	Multimodal	Gravel	2.40%



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GREEN VOLT

Flotation Energy Ltd | 12 Alva Street | Edinburgh EH2 4QG | Scotland
Tel: [redacted] | enquiries@flotationenergy.com | www.flotationenergy.com