Natural England Commissioned Report NECR302

Dover to Folkestone MCZ 2016 Survey Report

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Foreword

Natural England commission a range of reports from external contractors to provide evidence and advice to assist us in delivering our duties. The views in this report are those of the authors and do not necessarily represent those of Natural England.

Background

Following designation, Natural England started a baseline monitoring programme across all marine protected areas.

This report was commissioned as part of an inshore benthic marine survey of the Dover to Folkestone MCZ.

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Further information
This report can be downloaded from the Natural England Access to Evidence Catalogue: **http://publications.naturalengland.org.uk/** . For information on Natural England publications contact the Natural England Enquiry Service on 0300 060 3900 or e-mail **enquiries@naturalengland.org.uk**.

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Dover to Folkestone MCZ 2016 Survey Report

Project Code: C5785F

Authors: Mike Fraser and Jonny Easter

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Dover to Folkestone MCZ
2016 Survey Report

Project Code: C5785F

Authors: Mike Fraser and Jonny Easter

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Matt Curtis	Cefas Benthic Ecologist
Ben Green	Natural England/Environment Agency Marine Ecology Technical Specialist

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1. Introduction

The Marine and Coastal Access Act 2009 requires the UK Government to create a coherent network of Marine Conservation Zones (MCZs) in British waters. MCZs will exist alongside other Marine Protected Areas (MPAs), including Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Sites of Special Scientific Interest (SSSIs) and Ramsar sites to help conserve marine biodiversity, in particular habitats and species of European and national importance.

Through Defra, and with written advice from the Statutory Nature Conservation Bodies* (SNCBs), four regional projects were established to identify potential MCZs within the UK EEZ. These projects were called Net Gain (North Sea), Balanced Seas (South East waters), Finding Sanctuary (South West waters) and the Irish Sea Conservation Zones (Irish Sea) (see http://jncc.defra.gov.uk/mczmap accessed 9 March 2017). They combined stakeholder consultation with existing scientific data to propose recommended MCZs in their region that would contribute to the overall network. The four projects reported in September 2011, each producing a 'final recommendations' report, which contained Site Assessment Documents (SADs) for each of the rMCZs. Following a report review by an independent scientific advisory panel, a programme of habitat verification surveys was commissioned by Defra to strengthen the scientific evidence base for some of the rMCZs. During the next two years, the programme was coordinated by Cefas and involved a range of service providers from both the public and private sector. The SNCBs considered the additional evidence and sent final site recommendations to the Environment Minister for formal designation.

On the 21st November 2013, the UK Government announced the designation of 27 MCZs in the first tranche. A further 23 MCZs were announced in the second tranche of designations, which included Dover to Folkestone MCZ on the 17th January 2016. The site has been created to protect important chalk and boulder habitats.

Following designation, Natural England started a monitoring programme across all Tranche 1 and 2 MCZs, targeting specific features present both inside and outside each site boundary. The initial datasets gathered will be used to inform future monitoring and management of the sites.

*Natural England and the Joint Nature Conservation Committee (JNCC)

1.1. Site Description

The Dover to Folkestone MCZ is an inshore site on the Kent coast that covers an area of 20 km^2 (Figure 2). The site extends from the West Dover Harbour wall to Copt Point at the westward boundary of the MCZ. The MCZ was proposed by the Balanced Seas regional stakeholder project (Balanced Seas, 2011) and designated in January 2016. It overlaps the Kent South WFD Water Body.

Erosion of the famous chalk cliffs in the area create boulders and flat areas at the base of the cliff that support unique seaweed and animal communities (Dover to Folkestone MCZ Factsheet, 2016). The site is considered important for under boulder communities, an essential habitat for sea squirts, sponges and algae (Dover to Folkestone MCZ Factsheet, 2016). The designation of this site protects several sediment and rock habitats, native oysters and the Folkestone Warren geological feature (Table 1). Detailed site information can be found in the Dover to Folkestone MCZ Factsheet (Dover to Folkestone MCZ Factsheet, 2016).

Table 1. Subtidal protected features within the Dover to Folkestone MCZ (Dover to Folkestone MCZ Factsheet, 2016). (Maintain = Maintain in favourable condition). The 2016 survey focuses on those features shaded blue.

Habitat FOCI	Protected Features	Current General Management Approach
Broadscale Habitats	Moderate energy infralittoral rock	Maintain
	Subtidal coarse sediment	Maintain
	Subtidal mixed sediments	Maintain
	Subtidal mud	Maintain
	Subtidal sand	Maintain
Species FOCI	Native Oyster (*Ostrea edulis*)	Maintain
Geological Feature	Folkestone Warren	Maintain

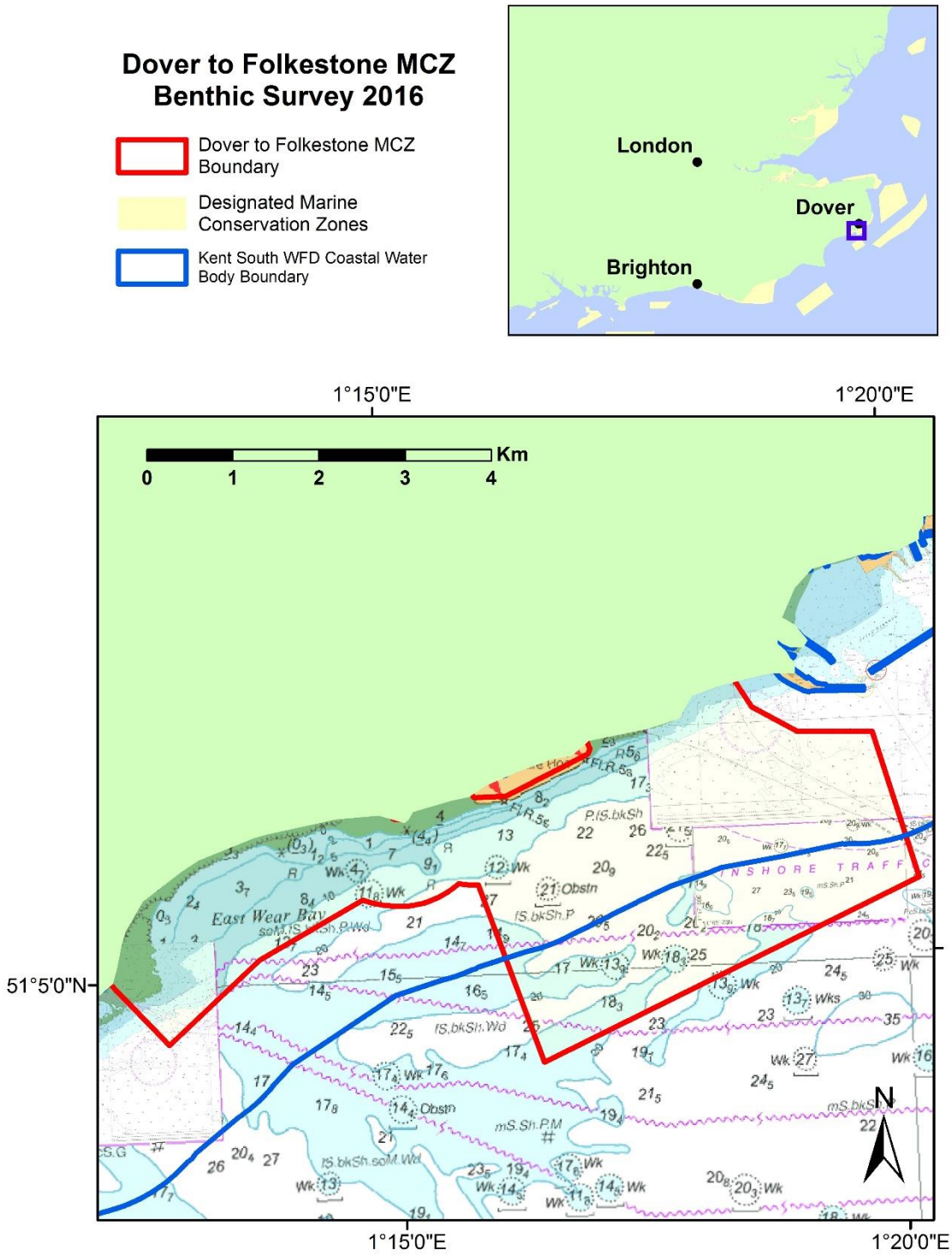

Figure 1. Location of the Dover to Folkestone Marine Conservation Zone (MCZ) in the context of other MCZs in the south east of England.

2. Survey Design and Methods

2.1. Survey Aim and Objectives

Overall Survey Aim

To undertake a benthic survey of the designated subtidal Broadscale Habitat features of the Dover to Folkestone MCZ in order to obtain improved evidence, potentially ascribe condition and provide a dataset which can then be used to detect change over time and support future monitoring.

Survey objectives

- To undertake a camera and grab survey of the designated features based on a Type 3 monitoring survey design (JNCC/Cefas, 2017), to provide information on Broadscale Habitat distribution across the site.

- To provide incidental records of the species Features Of Conservation Interest (FOCI) that inhabit the site within the confines of the survey approach and platform utilised. It should be noted that this is a secondary objective of the survey.

2.2. Survey Design and Planning Phase

The Dover to Folkestone MCZ survey of the protected infralittoral rock, subtidal mud, subtidal sand, subtidal coarse sediment and subtidal mixed sediments Broadscale Habitats was based on a Before-After-Control-Impact (BACI) sampling design. A combination of drop camera and sediment grabbing survey techniques was used to provide point records of the habitat and species Features of Conservation Importance (FOCI) (Figure 3).

The number of sampling stations needed within the infralittoral rock habitat was determined via power analysis of data from the 2012 verification survey (Godsell et al. 2013). This analysis indicated that twenty-three infralittoral rock camera tows were needed to detect 20% change in species richness at 80% power at 0.05 significance. Therefore, the survey was designed to meet these sample sizes both inside as well as outside the MCZ where possible.

The broadscale habitat map generated by the 2012 verification survey (Colenutt et al., 2015) and the Natural England evidence database were used to inform the target sampling locations. Within the MCZ boundary, thirty-five samples were chosen through a combination of randomly selected stations and re-sampling of the 2012 drop down video and grab stations (Table 2).

Inside the MCZ, 23 grab samples were placed in subtidal coarse sediment/mixed sediment areas, 9 in subtidal sand areas, and 3 around the single subtidal mud sample (identified from 2012 data). This resulted in a total of 35 grab stations inside the MCZ.

Table 2. 2012 Dover to Folkestone MCZ camera and grab stations to be resampled.

Sampling Gear	No. stations to be resampled	Station numbers
Camera	6	33, 34, 35, 36, 37, 55,
Day Grab	4	1, 22, 30, 56,

Outside the MCZ boundary, a further nineteen grab stations were selected based on bathymetry and existing sediment data. The stations were placed along the MCZ boundary and to the west of the MCZ but not below the 20 m depth contour (as marked on the Admiralty Chart) in order to sample within the same depth range as the stations located inside the MCZ. The aim was for samples collected from outside of the Dover to Deal MCZ to be combined with samples from this survey to improve the BACI design.

For infralittoral rock, the only possible drop down video stations identified outside the site boundary were to the south of the MCZ, directly east and to the west of Folkestone. Seven drop video stations were added in these areas. Again, the stations were selected within the same depth range as the drop video stations inside the MCZ. The aim was for samples collected from outside of Dover to Deal MCZ to be combined with samples from this survey to improve the BACI design.

Five stations were selected for sediment contaminant analysis (heavy metals, PAHs, PCBs, TBT) inside the Dover to Folkestone MCZ boundary.

Marine specialists from the Environment Agency and Natural England reviewed the plan. The following hazards were identified from the UKHO Admiralty charts: underwater cables, shallow water depths and underwater obstructions. Sampling stations were relocated to avoid these hazards as far as possible. A ‘notification of an exempt activity form’ was submitted to the Marine Management Organisation prior to the survey being carried out

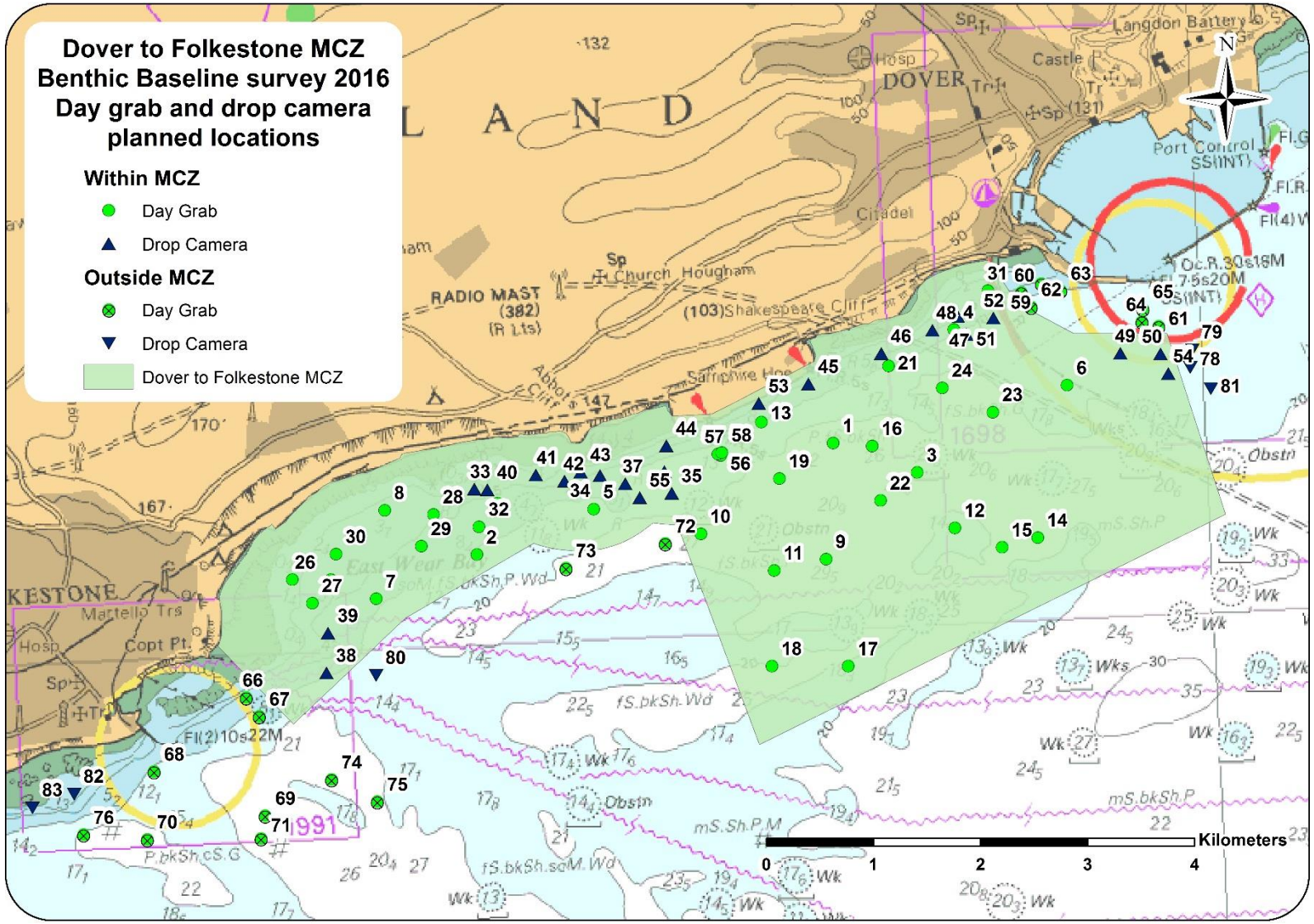

Figure 2. Dover to Folkestone MCZ 2016 survey plan.

2.3. Survey Team

The Dover to Folkestone MCZ was surveyed between the 17th and 25th August 2016. The survey team comprised of four Environment Agency survey officers and two taxonomic specialists from APEM. The coastal survey vessel *Solent Guardian*, staffed and operated by Briggs Marine (Figure 1, Annex 7.1) was used to conduct the survey work reported here.

Figure 3. Coastal survey vessel *Solent Guardian*, operated by Briggs Marine.

2.4. Sample Collection Methodology

2.4.1. Habitat Characterisation and In-situ Benthic Epifauna Identification

Drop video camera equipment (Annex 7.2.2) was deployed in accordance with the MESH 'Recommended Operating Guidelines (ROG) for underwater video and photographic imaging techniques' (Coggan et al., 2007). The STR SeaSpyder camera system was deployed from the stern of the survey vessel, as shown in Figure 4. Real time navigation data acquisition and manual position fixing when the gear contacted the seabed was captured via Trimble® HYDRO*pro*™ software and logged by the survey officer. The mid-point of the vessel's stern gantry was used as the default offset for position fixing (see Annex 7.2.1 for further details). Video files and digital still images were transmitted via the sea cable to be captured and saved directly to a computer in the survey cabin. The video footage was annotated with time and position using a GPS (SIMRAD MX512 DGPS) referenced video overlay (uncorrected position data). Images of the seabed were captured approximately every 10 to 15 metres over a distance of > 150 metres. Extra photographs were taken in heterogeneous areas of BSH and if particular habitat/species FOCI were observed. If a BSH habitat boundary was detected towards the end of a tow, the camera deployment was extended to confirm the change. The drop frame depth was controlled via a winch operator receiving instructions from the survey cabin. For further deployment details please see the 'EA underwater video procedure_version 2.2' in Annex 7.3.

Figure 4. STR SeaSpyder drop camera system being deployed from the stern of the coastal survey vessel.

During each drop camera deployment a member of the survey team continuously monitored the real-time video feed, recording general station notes, habitat information and fauna observations (please see Annex 7.5 for a worked example of the video logsheet).

2.4.2. Broadscale Habitat Ground Truthing

A Day grab (Figure 5), with a sampling area of 0.1 m^2 was deployed from the stern gantry of the survey vessel to recover sediment from the seabed as described in the Environment Agency Water Framework Directive (WFD) operational instructions 104_10 (2012) and 009_07 (2014). Sampling positions were recorded (fixed) using Hydropro data acquisition software when the gear contacted the seabed. The mid-point of the vessel's stern gantry was used as the default offset for position fixing (see Annex 7.2.1 for further details).

The EA WFD sampling methodology required two similar samples; the first was used to obtain a fauna sample (minimum depth of 5 cm in sand habitat and 7 cm in mud habitat) and the second solely to obtain a sub-sample for particle size analysis. A general description of the sediment and a preliminary habitat assessment using a modified folk classification system (Long, 2006) was recorded.

The sample was also inspected for a Redox Potential Discontinuity (RPD) or 'black layer', if present, the depth below the surface was recorded. The faunal sample was then processed, by washing over a sieve (1.0 mm mesh). The retained material was photographed on the sieve and preserved in a buffered 8% formaldehyde solution for transfer ashore to a specialist laboratory for analysis. Further grab attempts were made to acquire a second sample containing similar material to the first (grabs with dissimilar material were discarded). A full depth-integrated core of sediment (approx. volume of 500 ml) was taken from the second sample for particle size analysis.

At four stations, additional grabs were collected to retrieve material for contaminant analyses following the methodology detailed in the Environment Agency operational instruction 10_01 (2007). Surface scrapes (i.e. the recently deposited sediment) were removed from each grab to a maximum depth of 1 cm (avoiding the anoxic layer). A metal scoop was used to collect material for organic contaminant analyses and a plastic scoop for heavy metals. The remaining material was then discarded. The top 1 cm was used as this provides a record of the most recent contaminant levels deposited in the sediment. All samples were stored frozen at -20°C after collection.

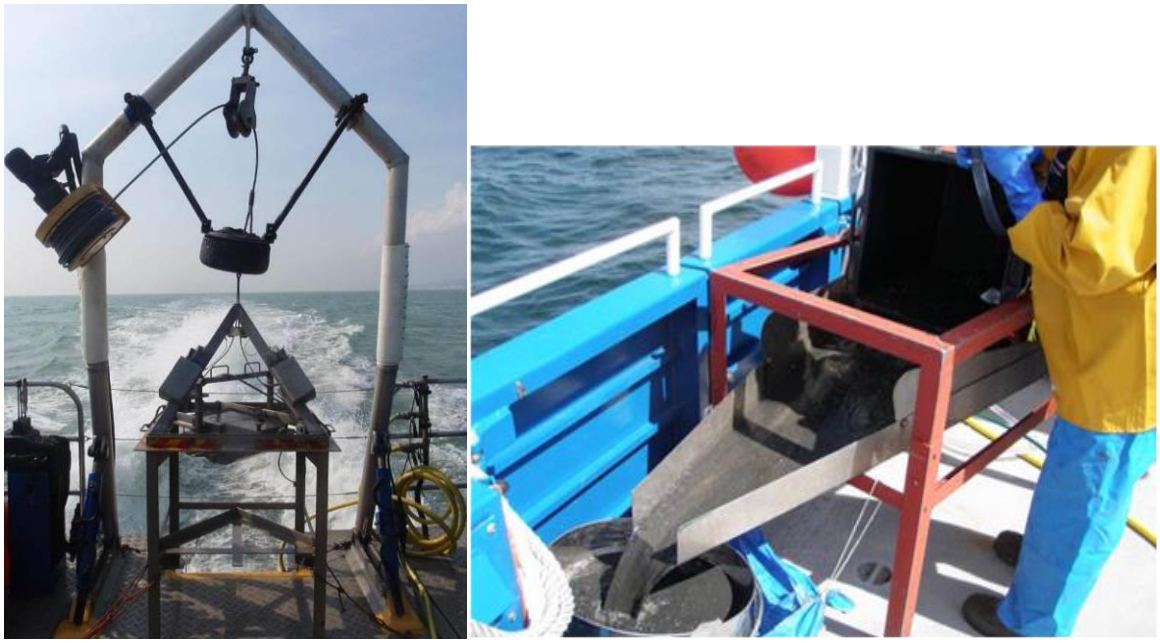

Figure 5. Day grab (left), and equipment for sieving benthic fauna samples (right).

3. Survey Narrative

The Dover to Folkestone MCZ monitoring survey was completed between the 17th and 25th August 2016. EA marine monitoring officers mobilised to Dover Marina on the 16th August and prepared the coastal survey vessel (CSV) *Solent Guardian* for camera survey operations. Following a safety briefing for all staff on the morning of the 17th August and a test deployment of the equipment, the vessel departed Dover Marina at 07:00 UTC to conduct camera survey operations in the Dover to Folkestone MCZ. Camera surveying commenced in the Dover to Folkestone (DVFK) MCZ until 15:00 UTC. Twenty-eight stations were surveyed within the DVFK MCZ, before the vessel was relocated to the Dover to Deal (DOVD) MCZ. The vessel returned to Dover Marina at 16:45 UTC. Survey operations continued on the 18th August 2016, with *Solent Guardian* leaving Dover Marina at 06:53 UTC. The team spent the morning surveying within the DOVD MCZ, returning to DVFK at 13:00 UTC to complete the final two stations. Once back alongside, the camera system was removed from the vessel and the Day grab installed.

Following a change in personnel and a toolbox talk on the use of the Day grab, sampling began on the 19th August in the Dover to Folkestone MCZ at seventeen stations. Viable infauna and PSA samples were collected from eleven stations. At DVFK24 the material retrieved with the grab was only sufficient for particle size analysis. At DVFK47 a small infauna sample was retained for species identification. Four stations were discarded as no viable samples were collected after multiple grab deployments.

Survey operations resumed in the Dover to Folkestone MCZ on the 23rd August after three down-weather days. The *Solent Guardian* left Dover marina at 07:00 UTC after completing a toolbox talk and test deployment of the Day grab. Thirty-three stations were surveyed, with viable infauna and PSA samples collected at 27 stations and PSA samples retrieved from three stations. On the 24th August, 2016 sampling activity switched to the Dover to Deal MCZ.

The team aboard the *Solent Guardian* departed Dover Marina at 06:30 UTC the following morning and surveying recommenced in the Dover to Folkestone MCZ at 10:00 UTC. A total of seven stations were sampled, five of which were new locations and two were revisited. From these, three stations yielded viable samples for infaunal community and PSA, and one for PSA only. Three stations were discarded. Survey operations were completed at 16:45 UTC and the vessel returned to the Marina to off-load the equipment, samples and personnel.

4. Data Acquisition

4.1. Seabed Images

Video footage and digital photographs of the seabed were collected for broadscale habitat characterisation at twenty-nine stations inside and outside the Dover to Folkestone MCZ boundary (see Figure 7).

Poor and very poor visibility (see Annex 7.4) was encountered at 26 out of 32 stations that were attempted (3 stations were attempted twice). Good visibility was only observed at one station (DVFK47), on two separate occasions.

4.2 Sediment Samples

Viable grab samples for both infaunal and particle size analyses (PSA) were collected at 11 stations, using a Day grab (Figure 8). At eighteen stations, the quantity of sediment collected was only sufficient for PSA. Four stations were also successfully sampled for sediment contaminant analysis (DVFK1, 2, 18 and 24).

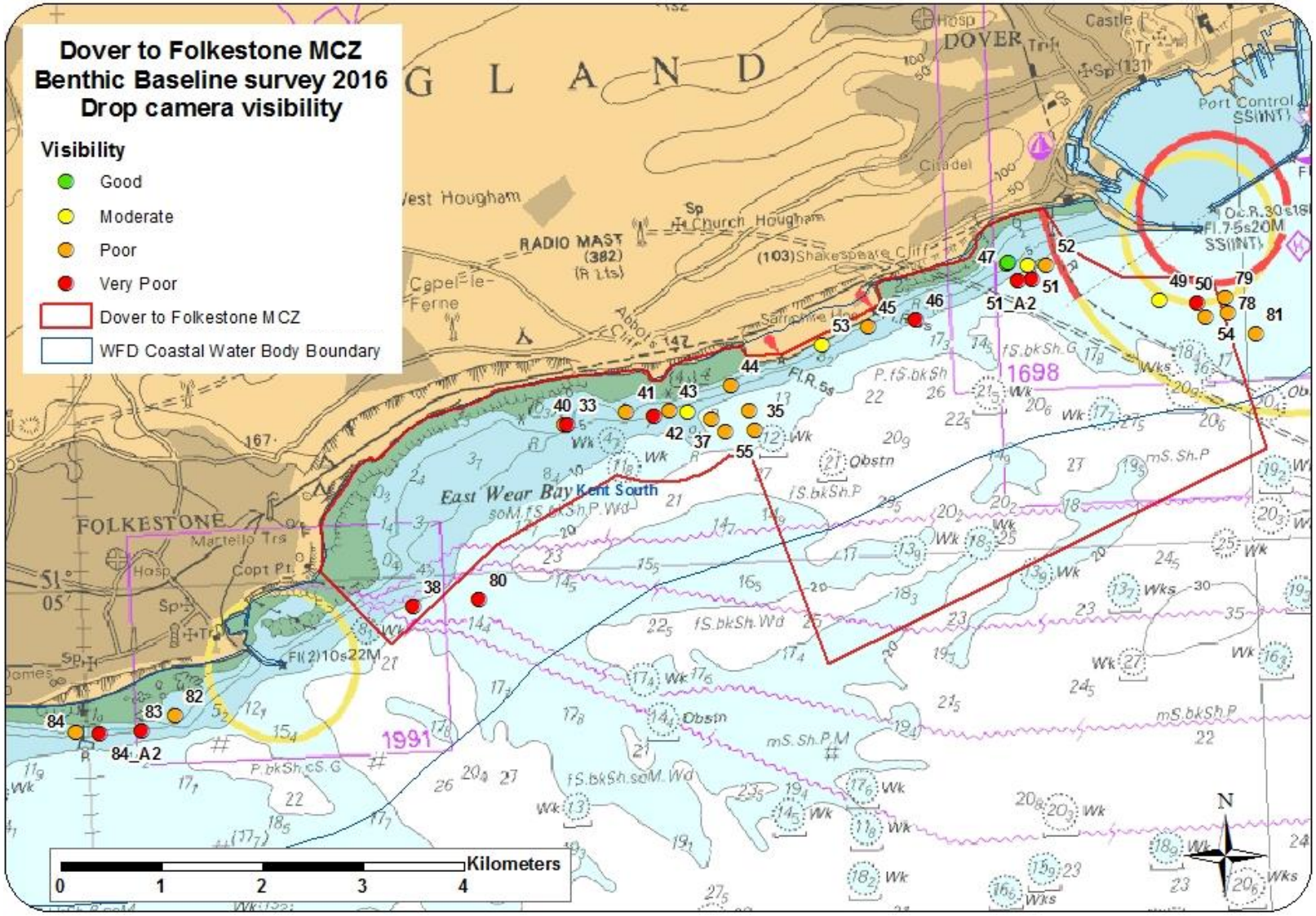

Figure 6. Underwater visibility encountered during the Dover to Folkestone MCZ 2016 survey.

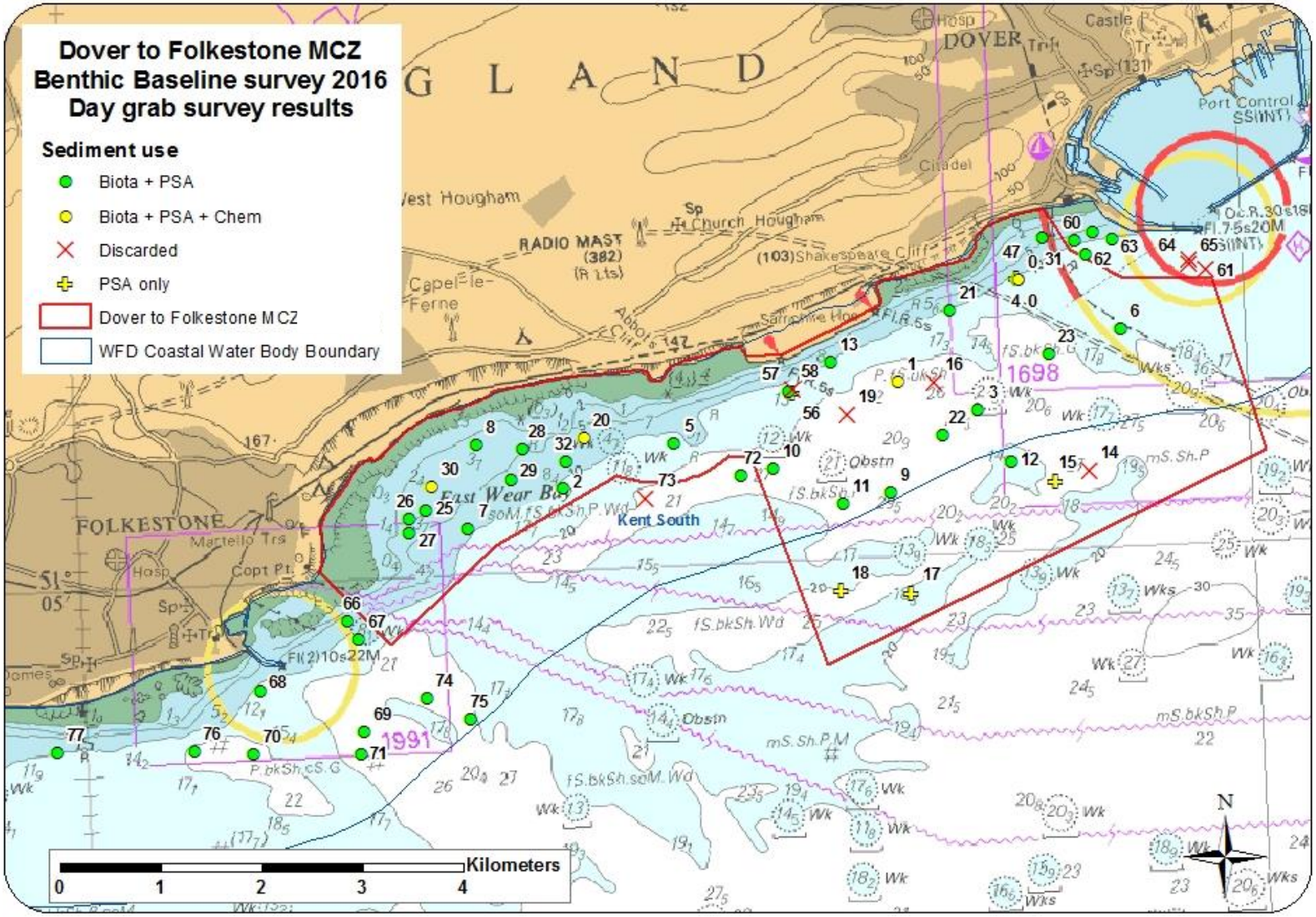

Figure 7. Dover to Folkestone MCZ 2016 grab survey results.

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6. General List of Abbreviations

BSH	Broadscale Habitat
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CHP	Civil Hydrography Programme
CS	Camera Sledge
CSV	Coastal Survey Vessel
DC	Drop Video Camera
Defra	Department for Environment, Food and Rural Affairs
DG	Day Grab
EA	Environment Agency
ENG	Ecological Network Guidance
FOCI	Features Of Conservation Importance
IFCA	Inshore Fisheries and Conservation Authority
MCZ	Marine Conservation Zone
MESH	Mapping European Seabed Habitats
MHM	Mini-Hamon Grab
MMS	Marine Monitoring Service
mSNCI	marine Sites of Nature Conservation Importance
PSA	Particle Size Analysis
REC	Regional Environmental Characterisation
rMCZ	recommended Marine Conservation Zone
rRA	recommended Reference Area
RSG	Regional Stakeholder Group
SAC	Special Area of Conservation
SAD	Site Assessment Document
SNCB	Statutory Nature Conservation Body
SOP	Standard Operating Procedure
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UTC	Coordinated Universal Time

7. Annexes

7.1 Coastal Survey Vessel General Information

Briggs Marine and Environmental Services Ltd.
Seaforth House, Seaforth Place, Burtisland, Fife, KY3 9AX.
Tel: +44(0)1592 872939
Email: marketing@briggsmarine.com
Website: www.briggsmarine.com

Solent Guardian

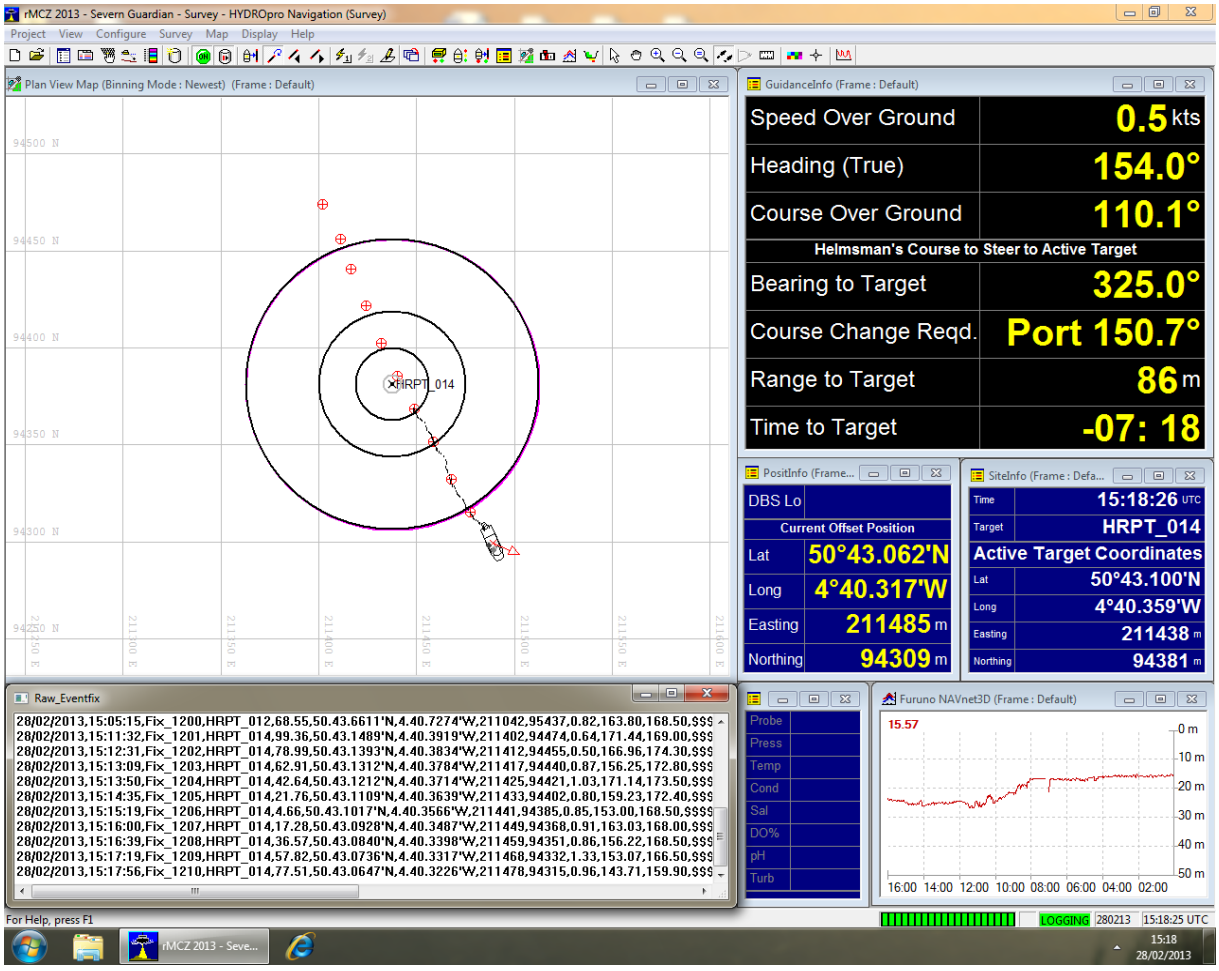
General Information
Length: 18.3 m
Beam: 6.3 m
Draft (baseline): 1.15 m
Draught (skegs): 2.2 m
Displacement (light ship): 22 T
Displacement (full load): 30 T
Service Speed: 16 knots
Maximum Speed: 18 knots

Main Equipment
Main Engines: 2 x Volvo D9-MH 261 bkW @ 2200 rpm. Twin Disc MGX-5075 integral vee-drive
Crew: 7
Scientific Officers: Up to 10
Accommodation: 3 x twin cabins and mess
Data network to share information around vessel
Wet lab/bench for processing water, sediment and ecology samples
Fridge/freezer for sample storage
Dry lab space for two computers and data processing
Large aft deck working area
A frame – 2 T SWL
Double Independent Drum Trawl Winch – 2 T SWL
Hydraulic crane

7.2 Survey Equipment

7.2.1 Navigation and Positioning

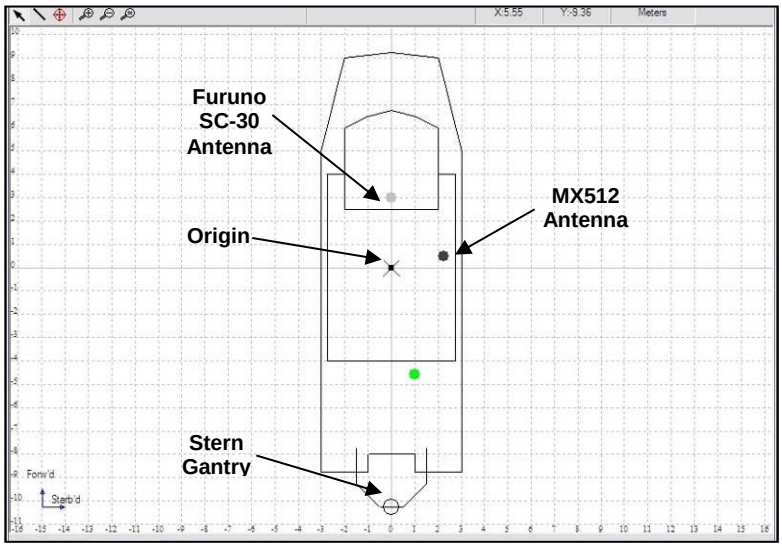
Trimble® HYDRO*pro*™ software is utilised for real-time navigation and survey data acquisition.



Trimble® HYDRO*pro*™ software screen grab displaying real-time navigation and survey data acquisition for a MCZ drop camera survey line.

Navigational and survey equipment offsets on the Coastal Survey Vessel *Solent Guardian* (Environment Agency Estuarine and Coastal Monitoring & Assessment Service).

NMEA Device	*Make/Model*	*Offset Name*	*Offset (m)*		
			X (Starb'd)	*Y (Forw'd)*	*Z +ve (Up)*
Gyrocompass	*Simrad Robertson RGC50*	*n/a*	*-*	*-*	*-*
Navigation Echosounder	*Furuno DFF1, 525ST-MSD transducer*	*n/a*	*-*	*-*	*-*
Survey Echosounder	*Kongsberg EA400*	*n/a*	*-*	*-*	*-*
Origin	*n/a*	*Origin*	*0.0*	*0.0*	*0.0*
Navigation GPS (Secondary)	*Furuno SC-30 DGPS*	*Furuno SC-30 Antenna*	*0.0*	*3.0*	*0.0*
Survey GPS (Primary)	*SIMRAD MX512 DGPS*	*MX512 Antenna*	*2.25*	*0.5*	*0.0*
n/a	*n/a*	*Sediment Grab (Stern Gantry)*	*0.0*	*-10.25*	*0.0*



Trimble® HYDROpro™ vessel editor screen showing survey equipment offsets from the origin (**Environment Agency Estuarine and Coastal Monitoring & Assessment Service**).

7.2.2 SeaSpyder Drop Camera System

STR
SUBSEA TECHNOLOGY & RENTALS

SEASPYDER DROP CAMERA SYSTEM

Surface Control Unit & Processor

The SeaSpyder Underwater Drop Camera System is part of a family of field proven camera systems manufactured by STR for the marine survey and environmental communities. The SeaSpyder is ideally suited for operation in shallow-medium water depths with the standard system having a working depth range of 500m. For applications demanding a deeper rating, a "telemetry" model is offered which operates over longer cable lengths for operation down to 1000m. Both models are fitted with a new generation digital SLR Camera offering high resolution digital stills and HD Video for the highest imagery detail. The high specification digital SLR Camera offers an impressive 18.0 mega pixels resolution and both manual and automatic focus for achieving the sharpest images. The captured digital stills are framed with the aid of dedicated real-time video and can be transferred to the topside 'on the fly' for rapid online review.

A 19" rack mount Surface Control Unit and powerful topside processor give full remote control of the camera via the easy to use SeaView GUI software. As standard, the purpose designed camera deployment frame is fitted with a subsea electronics and camera housing, high power underwater flash, an array of four high intensity LED lamps and dual scaling laser pointers to provide accurate imagery scaling. There is the option to install additional sensors with the availability of three user defined serial interfaces with optional power.

SYSTEM FEATURES

- Latest generation 18 Mega Pixels Digital SLR Camera
- Full remote control of camera functions including automatic and manual focus control
- 'On-the-fly' image download
- Real time HD Video
- High Intensity LED Lamps
- Dual lasers for precise imagery scaling
- High speed digital telemetry link to camera and sensors
- Additional user defined RS232 ports and 24VDC power interfaces

SEASPYDER SHALLOW WATER CAMERA SYSTEM

SEASPYDER RACK MOUNT PROCESSOR

Hardware: Standard 19" Rack Mountable
Processor: Intel I5 3.1GHz Quad-Core
Memory: 4GB DDR3 RAM
Storage: 500GB hard drive
Interface: DVD-RW, 2 x 1 GigE, 6 x USB, 4 x RS232
Display: 2 x 22" LED HDMI Monitor
Power: 110/240 VAC, 50 Hz (900W)
Dimensions: 19" 3U rack mountable 550 mm (L) x 485 mm (W) x 132mm (H)

SEASPYDER SEAVIEW SOFTWARE

Key Features:

- Remote control of SeaSpyder Digital Stills Camera
- Digital stills and video capture
- "On-the-fly" image download
- External overlay functions
- Realtime composite video
- HD video capture
- Remote control of lights, scaling lasers and additional sensors

SEASPYDER SURFACE CONTROL UNIT

ELECTRICAL

Power Input: 85 – 264 VAC (47 – 63 Hz) ≈ 500 W max
Cable Power: +/- 48VDC Nominal (≈ 400W max.) with built in electrical leakage detector

SIGNAL INTERFACE

Cable Interface #1: High bandwidth VDSL2
Cable Interface #2: Differential Colour Composite Video with automatic cable length compensation

MECHANICAL

Dimensions: 19" 2U rack mountable 550 mm (L) 485 mm (W), 88 mm (H)

SEASPYDER SUBSEA ELECTRONICS

ELECTRICAL

Power Output: 24VDC Output (200 W Max Subsea Power)
Interface: 1 x SeaSpyder Camera & Underwater Flash
4 x 24VDC LED Lamps
2 x RS232 Ports with 24VDC
1 x RS232 Port with 12 VDC/ 24VDC
1 x Dual Scaling Lasers

MECHANICAL

Diameter: 200mm
Length: 409mm
Standard Housing: Hard Anodised Aluminium
Depth Rating: 500m

SEASPYDER 18 MEGA PIXELS UNDERWATER DIGITAL STILLS CAMERA

ELECTRICAL

Image Size: JPEG (720 x 480) to (5184 x 3456)
Image Size: RAW (5184 x 3456)
Video: Full HD (1920 x 1080)
ISO Sensitivity: Auto (100 – 6400), 100 – 12800
Sensor Type: 22.3 x 14.9mm CMOS
Aspect Ratio: 3:2
Shutter Speed: 30 – 1/4000 Sec
Interface: Ethernet

OPTICAL

Standard Lens: 10 – 24mm
Macro Mode: F/3.5 – 4.5
Zoom: Fixed
Focus: Manual & Automatic mode
Angle of View: ≈65° in water
Vertical View: ≈1m²@ 80cm in water

SEASPYDER COLOUR VIDEO CAMERA

ELECTRICAL

Image Resolution: 600 TV lines
Video Format: PAL Composite Colour Video
Sensitivity: 0.01 Lux
Sensor Type: 1/3 Sony Super HAD CCD
Frame Rate: 50 FPS
Video Output: ≈1.3Vpp into 75Ω

OPTICAL

Lens Type: 3.6 mm Wide Angle

SEASPYDER HIGH POWER CAMERA FLASH

ELECTRICAL

Control: TTL control via digital stills camera
Power Input: Power supply via stills camera

MECHANICAL

Diameter: 150mm
Length: 230mm
Weight in Air: 7.6kg
Weight in Water: 3.54kg
Standard Housing: Hard Anodised Aluminium
Depth Rating: 3000 m

SEASPYDER 20W LED LIGHT

ELECTRICAL

Lighting: LED Lamp
Luminous Flux: 1500Lm
Wavelength: Neutral White
Power Input: 24 VDC @ 1.1 A (Built in thermal protection)

MECHANICAL

Diameter: 70mm
Length: 110mm
Weight in Air: 1kg
Weight in Water: 0.58kg
Standard Housing: Hard Anodised Aluminium
Depth Rating: 3000m

SEASPYDER DUAL SCALING SUBSEA LASERS

ELECTRICAL

Power Input: 8 V – 30VDC; 60 m A @ 24VDC

LASER

Type: 2 X Class II Safety Classification (<1 milliwatt output)
Beam Shape: Elliptical (Approx 6 mm Red Dot output)
Beam Divergence: - 0.75mrad
Wavelength: 650nm
Temperature Range: -10°C to 40°C

SEASPYDER DROP CAMERA FRAME

MECHANICAL

Length: 2.21m
Width: 1.43m
Height: 1.40m
Weight in Air: 125kg (Inc sensors)

7.3 EA underwater video procedure_version 2.2 (STR Systems)

The procedure outlined below has been developed through a series of discussions involving the Environment Agency, Cefas and Natural England. Due to the heterogeneous nature of the inshore coastal seabed habitat, strong tidal streams, various underwater hazards and no dynamic positioning system on the survey vessels, a flexible approach is recommended for the underwater video camera deployment. The procedure must be used in accordance with the MESH 'recommended operating guidelines (ROG) for underwater video and photographic imaging techniques' (Coggan et al., 2007).

Important points to remember:

- **Select stern gantry offset in Hydropro**
- **Synchronise all survey equipment (camera, laptops, etc.) with primary survey GPS time (UTC).**
- **Ensure the correct date, station code, time and position are displayed on the video overlay.**

Example:

EA Marine Monitoring Service_2013-1008

RNSB_GT025_STN_028 *(annotate if station has been attempted on a previous occasion A1, A2, etc.)*

UTC: 142544 (*real time feed from survey GPS*)

Lat: 5433.3403N (*real time uncorrected feed from survey GPS*)

Lon: 000038.9172W (*real time uncorrected feed from survey GPS*)

- **Alter the stills prefix to the correct station code.**

Example:

RNSB017_STN_? *(? = sequential 'STN or event' number expressed as an integer i.e. no leading zeros – refer to previous survey period for starting number)*

The software will then automatically add '_01, _02,_03.....' as the stills are captured – you may need to adjust the number of leading zeros.

Final stills code format saved to the laptop:

RNSB017_STN_14_01

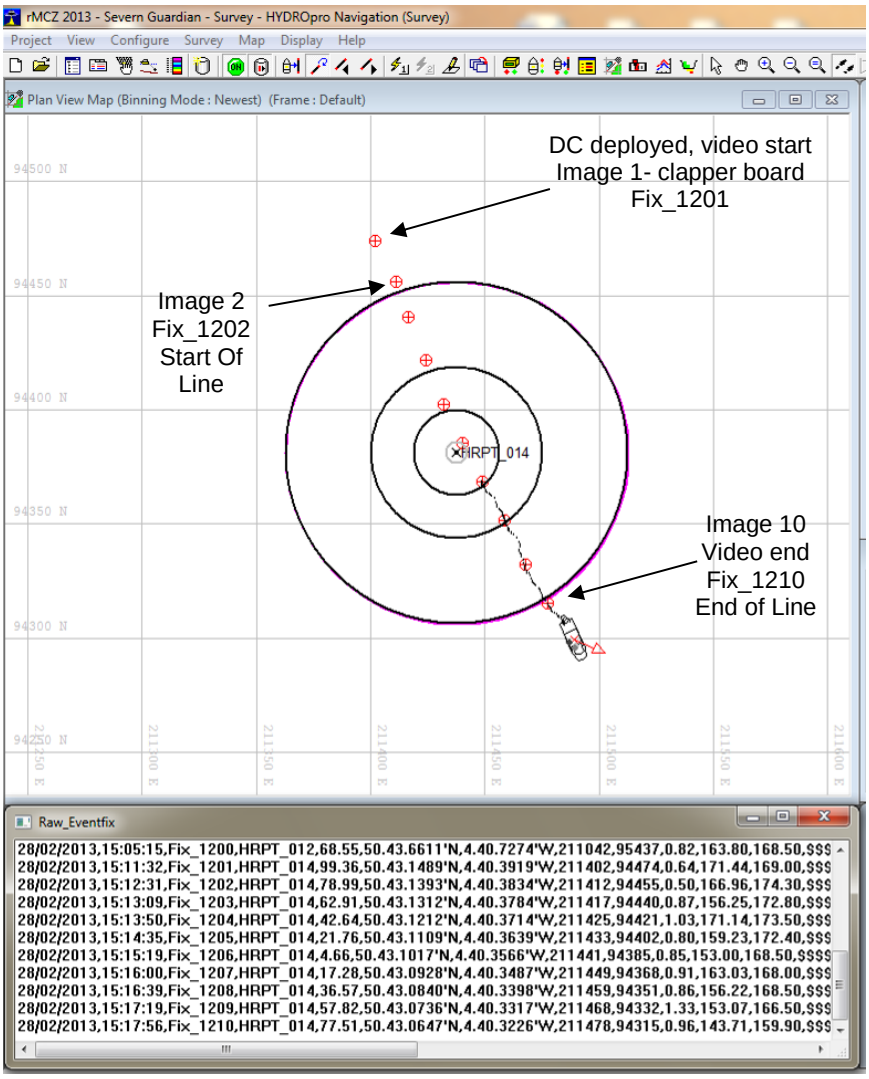
RNSB017_STN_14_02

RNSB017_STN_14_03

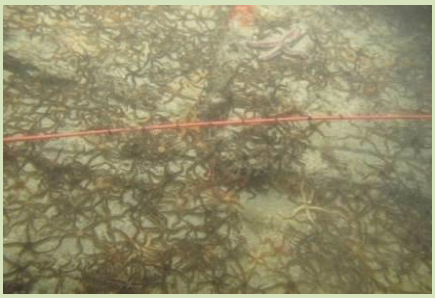
- **The field of view scale bar/laser points should be set up/calibrated prior to the survey commencing. Laser pointers are ineffective in moderate/poor visibility conditions; a rope with a visible scale will be required as a replacement**
- **Set the image resolution to Large Normal (Seabug 14.7 Megapixels, SeaSpyder 18.0 Megapixels).**
- **Check that the camera settings are appropriate for the conditions; that the LED lights are on if required and ensure that the video is recording throughout the deployment.**

- **If a Broadscale Habitat (BSH) boundary is detected, extend the deployment to gather as much information on habitat extent as possible.**
- **Take extra stills if habitat/species FOCI are observed – note these in the survey log.**
- **If possible, work a downhill seabed profile to avoid slack cable during deployment.**
- **Beware of sudden depth changes when surveying rocky areas.**
- **Abandon the station if survey conditions are hazardous.**

Video Camera Type	Survey Conditions	Deployment
Drop down	Good visibility	*Deploy camera, initially working across the Hydropro 75 m radius target area, as shown in the diagram below. Hover/rest camera above/on the seabed; take a still every 15 m. If tide/wind conditions do not allow a survey line to be followed across the bull ring, use the outer circle as a guide to ensure a distance of 150 m is covered (minimum) nearby.
	Poor visibility	Hover/rest camera above/on the seabed, take a still every 15 m. If the visibility is very poor, retrieve the equipment after taking 3 - 4 stills.



7.4 Underwater Visibility Scale

Example image	Scale	Definition
	Excellent	clear, sharp images - no suspended particulate matter
	Good	seabed features and epifauna clearly discernible
	Moderate	seabed features discernible - epifauna difficult to discern
	Poor	both seabed features and epifauna difficult to discern, low confidence in preliminary habitat assessment
	Very Poor	no seabed features or epifauna visible

7.5 MCZ Video logsheet

MCZ Video Logsheet (v1)

Station data

Contract Code: _____ Vessel: Solent Guardian Date: 17-8-2016

MCZ Name: Dover to Folkestone Station Code: GT_055

Nav-Log filename: SO 2016-0817 SL Sampling Gear: Drop Camera Water Depth: 18 m

Cable Out: _____ (metres). Speed Over Ground (SOG): 0.9 (knots)

Notes on Station:
(including any times & adjustments to Cable Out)

Position Reference Point: Stern Gantry

Sample data

Digital Video Tape label: _____

Filename on Hard-Drive: DVFK_2GDK70816_GT055_STN-4_A1

No. of camera stills: 11 Stills folder name: GT055_STN-4

	GPS Time hh:mm		Fix No	Position in Lat/Long (WGS84)	DV tape counter Mins	Secs
Start of Video (SOV)	09	22	5441	51 ° 05.70 N; 01 ° 15.53 W/E		
End of Video (EOV)	09	33	5453	51 ° 05.71 N; 01 ° 15.39 W/E		

Visual / Video notes: (ground-type, terrain, visibility, species, FOCI, sketch of transect)

Poor visibility - Rock observed.

Broad-scale habitats observed

Infralittoral Rock		Circalittoral Rock		Sediment habitats		Others	
high energy		high energy		subtidal mixed		macrophyte dominated sed's	
mod.energy	X	mod.energy		subtidal coarse			
low energy		low energy		subtidal mud		biogenic reef	
				subtidal sand		deep-sea bed	

Completed by: M. Fraser Checked by: _____ Entered by: M. Fraser

7.6 Daily Progress Reports

Vessel: Solent Guardian	Project: Dover to Folkestone MCZ survey
Daily Progress Report No.1	Location: Dover Marina
Date: 16/08/2016	

Safety

	Today	To Date
Accidents/Incidents	0	0
Near Misses	0	0
Safety Drills/Induction	1	1
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
07:00	13:00	Mobilisation	
13:00	17:00	Equipment	Camera system arrived and was set up

Weather

Weather/sea state conditions	0000-0600	0600-1200	1200-1800	1800-2400	Remarks
Wind			Easterly of north easterly 4 or 5, occasionally 6.		
Sea state			Slight, occasionally moderate		
Swell			0.45m (Folkestone)		
Visibility			Good		

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob	06:00	06:00	
Offshore Calibrations			
Total Operation (Camera) Survey (TOSu)			
Total Operation (Grab) Sampling (TOSa)			
Equipment/Downtime	04:00	04:00	
Ship/Plant Downtime			
Waiting On Weather			
Transit			
Standby Port			
Demob			
Other			
Total:			

Overall Progress Groundtruthing Samples

Action	Sites Total	Sites Complete	Remaining Sites		Remarks
Day Grab	48	0	48		
Drop Camera	40	0	40		

Weather forecast for the next 24 hours

Easterly or northeasterly 4 or 5, becoming variable 3 at times, occasional rain or showers later

Planned operation for the next 24 hours (00:00 to 24:00 on 24th April 2013)

Commence drop down video at Dover to Folkestone MCZ or Dover to Folkestone depending on wind direction/speed

Agreed Changes to Scope/Survey operation priorities

No changes required

Comments

Vessel: Solent Guardian	Project: Dover to Deal/Folkestone MCZ survey
Daily Progress Report No.2	Location: Dover Marina
Date: 17/08/2016	

Safety

	Today	To Date
Accidents/Incidents	0	0
Near Misses	0	0
Safety Drills/Induction	1	2
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
08:00	08:15	Other	Toolbox talk and dry run of camera deployment
08:15	08:45	Transit	
08:45	17:15	Camera survey	
17:15	17:45	Transit	

Weather

Weather/sea state conditions	0000-0600	0600-1200	1200-1800	1800-2400	Remarks
Wind		Easterly of north easterly becoming variable, 3 or 4	North easterly 3 or 4		
Sea state		Slight, occasionally smooth	Slight		
Swell		0.38m (Folkestone)	0.43m (Folkestone)		
Visibility		Moderate or good	Good		

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob		06:00	
Offshore Calibrations			
Total Operation (Camera) Survey (TOSu)	08:30	08:30	
Total Operation (Grab) Sampling (TOSa)			
Equipment/Downtime		04:00	
Ship/Plant Downtime			
Waiting On Weather			
Transit	01:00	01:00	
Standby Port			
Demob			
Other	00:15	00:15	Toolbox talks
Total:	09:45	19:45	

Overall Progress Groundtruthing Samples

Action	Sites Total	Sites Complete	Remaining Sites		Remarks
(DOVD) Day Grab	48	0	48		
(DOVD) Drop Camera	40	7	33		
(DVFK) Day Grab)	54	0	54		
(DVFK) Drop Camera	30	28	2		Remaining sites were inaccessible due to fishing gear

Weather forecast for the next 24 hours

Variable 3 or 4, becoming southerly 4 or 5 later. Sea state – smooth or slight becoming moderate. Weather – rain or showers.

Planned operation for the next 24 hours (00:00 to 24:00 on 24th April 2013)

Complete the remaining camera sites at Dover to Deal, remaining time will be spent re-visiting sites that had poor visibility today.

Agreed Changes to Scope/Survey operation priorities

No changes required

Comments

Vessel: Solent Guardian	Project: Dover to Deal/Folkestone MCZ survey
Daily Progress Report No.3	Location: Dover Marina
Date: 18/08/2016	

Safety

	Today	To Date
Accidents/Incidents	0	0
Near Misses	0	0
Safety Drills/Induction	1	2
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
08:00	08:30	Transit	
08:30	14:30	Camera survey	
14:30	15:00	Transit	
15:00	16:00	Equipment	Change over from camera to Day grab

Weather

Weather/sea state conditions	0000-0600	0600-1200	1200-1800	1800-2400	Remarks
Wind		Variable 3 or 4, becoming southerly 4 or 5 later.	ENE 3		
Sea state		Smooth or Slight	Slight		
Swell		0.25m (Folkestone)	0.28m (Folkestone)		
Visibility		Moderate or good, occasionally	Good		

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob		06:00	
Offshore Calibrations			
Total Operation (Camera) Survey (TOSu)	06:00	14:30	
Total Operation (Grab) Sampling (TOSa)			
Equipment/Downtime	01:00	05:00	Changeover from camera to Day grab
Ship/Plant Downtime			
Waiting On Weather			
Transit	01:00	02:00	
Standby Port			
Demob			
Other		00:15	
Total:	08:00	27:45	

Overall Progress Groundtruthing Samples

Action	Sites Total	Sites Complete	Remaining Sites	Remarks
(DOVD) Day Grab	48	0	48	
(DOVD) Drop Camera	40	32	8	Repeated 2 stations to improve coverage. 8 sites dropped following nil visibility in sites north of the MCZ.
(DVFK) Day Grab)	54	0	54	
(DVFK) Drop Camera	30	30	0	Repeated 4 stations to improve coverage and the fishing gear preventing surveying yesterday

Weather forecast for the next 24 hours

Wind: southerly 5 or 6, veering southwesterly 5 to 7, perhaps gale 8 later. Sea state: Slight or moderate, becoming rough later. Visibility: Moderate or good occasionally poor.

Planned operation for the next 24 hours (00:00 to 24:00 on 24th April 2013)

Begin Day grab activities at DVFK. Operations will cease at 1500 to allow demobbing of camera equipment

Agreed Changes to Scope/Survey operation priorities

No changes required

Comments

Vessel: Solent Guardian	Project: Dover to Deal/Folkestone MCZ survey
Daily Progress Report No.4	Location: Dover Marina
Date: 19/08/2016	

Safety

	Today	To Date
Accidents/Incidents	0	0
Near Misses	0	0
Safety Drills/Induction	2	4
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
08:00	08:15	Induction	New survey personnel received a vessel induction, we had a toolbox talk and demonstration of the Day grab procedure
08:15	08:45	Transit	
08:45	13:15	Day grab survey	
13:15	14:00	Transit	
14:00	15:00	Demob camera	

Weather

Weather/sea state conditions	0000-0600	0600-1200	1200-1800	1800-2400	Remarks
Wind		Southerly 5 or 6, veering southwesterly 5 to 7. Sea state:	SW 4 to 5		
Sea state		Slight or moderate, becoming rough later	Moderate or rough		
Swell		0.35m (Folkestone)	0.9m (Folkestone)		
Visibility		Moderate or good	Moderate		

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob		06:00	
Offshore Calibrations			
Total Operation (Camera) Survey (TOSu)	04:30	19:00	
Total Operation (Grab) Sampling (TOSa)			
Equipment/Downtime		05:00	
Ship/Plant Downtime			
Waiting On Weather			
Transit	01:15	03:15	
Standby Port			
Demob	01:00	01:00	Demob camera system
Other	00:15	00:30	Day grab and vessel induction
Total:	07:00	34:45	

Overall Progress Groundtruthing Samples

Action	Sites Total	Sites Complete	Remaining Sites	Remarks
(DOVD) Day Grab	48	0	48	
(DOVD) Drop Camera	40	32	8	Repeated 2 stations to improve coverage. 8 sites dropped following nil visibility in sites north of the MCZ.
(DVFK) Day Grab)	54	16	38	Biota and PSA samples collected at 11 sites, PSA only at 1 site and no samples were able to be collected at 4 sites
(DVFK) Drop Camera	30	30	0	Repeated 4 stations to improve coverage and the fishing gear preventing surveying yesterday

Weather forecast for the next 24 hours

Wind: Southwesterly 6 to gale 8, veering westerly 5 to 6 later. Sea state: Moderate or rough. Visibility: Good occasionally poor.

Planned operation for the next 24 hours (00:00 to 24:00 on 20th August 2016)

No survey operations due to strong winds

Agreed Changes to Scope/Survey operation priorities

No changes required

Comments

Vessel: Solent Guardian	Project: Dover to Deal/Folkestone MCZ survey
Daily Progress Report No.5	Location: Dover Marina
Date: 22/08/2016	

Safety

	Today	To Date
Accidents/Incidents	0	0
Near Misses	0	0
Safety Drills/Induction	2	4
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
07:00	19:00	Down-weathered	Strong winds and a high sea state meant that survey operations were halted

Weather

Weather/sea state conditions	0000-0600	0600-1200	1200-1800	1800-2400	Remarks
Wind		Westerly 4	WNW 4		
Sea state		Slight or moderate	Slight or moderate		
Swell		0.75m (Folkestone)	0.7m (Folkestone)		
Visibility		Moderate or good	Moderate or good		

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob		06:00	
Offshore Calibrations			
Total Operation (Camera) Survey (TOSu)		19:00	
Total Operation (Grab) Sampling (TOSa)			
Equipment/Downtime		05:00	
Ship/Plant Downtime	12:00	36:00	
Waiting On Weather			
Transit		03:15	
Standby Port			
Demob		01:00	
Other		00:30	
Total:	12:00	70:45	

Overall Progress Groundtruthing Samples

Action	Sites Total	Sites Complete	Remaining Sites	Remarks
(DOVD) Day Grab	48	0	48	
(DOVD) Drop Camera	40	32	8	Repeated 2 stations to improve coverage. 8 sites dropped following nil visibility in sites north of the MCZ.
(DVFK) Day Grab)	54	16	38	Biota and PSA samples collected at 11 sites, PSA only at 1 site and no samples were able to be collected at 4 sites
(DVFK) Drop Camera	30	30	0	Repeated 4 stations to improve coverage and the fishing gear preventing surveying yesterday

Weather forecast for the next 24 hours

Wind: Easterly or southeasterly, becoming variable later, 3 or 4, occasionally 5 at first. Sea state: Mainly slight. Visibility: Moderate or good, occasionally poor later.

Planned operation for the next 24 hours (00:00 to 24:00 on 20th August 2016)

We will continue with Day grab surveying in DVFK MCZ

Agreed Changes to Scope/Survey operation priorities

No changes required

Comments

Vessel: Solent Guardian	Project: Dover to Deal/Folkestone MCZ survey
Daily Progress Report No.6	Location: Dover Marina
Date: 23/08/2016	

Safety

	Today	To Date
Accidents/Incidents	0	0
Near Misses	0	0
Safety Drills/Induction	2	6
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
07:45	08:00	Induction and toolbox talk	Vessel induction and grab procedure toolbox talk for new survey staff
08:00	08:45	Transit	
08:45	17:15	Grab survey	
17:15	17:45	Transit	
17:45	19:00	Sample processing	

Weather

Weather/sea state conditions	0000-0600	0600-1200	1200-1800	1800-2400	Remarks
Wind		Easterly or southeasterly 3 or 4	Easterly 2		
Sea state		Slight	Slight		
Swell		0.18m (Folkestone)	0.21m (Folkestone)		
Visibility		Good, occasionally poor	Good, occasionally poor		

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob		06:00	
Offshore Calibrations			
Total Operation (Camera) Survey (TOSu)		19:00	
Total Operation (Grab) Sampling (TOSa)	08:30	08:30	
Equipment/Downtime		05:00	
Ship/Plant Downtime		36:00	
Waiting On Weather			
Transit	01:15	04:30	
Standby Port			
Demob		01:00	
Other	01:30	02:00	Induction and sample processing
Total:	11:15	82:00	

Overall Progress Groundtruthing Samples

Action	Sites Total	Sites Complete	Remaining Sites	Remarks
(DOVD) Day Grab	48	0	48	
(DOVD) Drop Camera	40	32	8	
(DVFK) Day Grab)	54	49	5	
(DVFK) Drop Camera	30	30	0	

Weather forecast for the next 24 hours

Wind: Variable 3 or less, increasing 4 at times. Sea state: Smooth or slight. Visibility: Moderate or good, occasionally poor.

Planned operation for the next 24 hours (00:00 to 24:00 on 24th August 2016)

We will begin with Day grab surveying in DOVD MCZ

Agreed Changes to Scope/Survey operation priorities

No changes required

Comments

Vessel: Solent Guardian	Project: Dover to Deal/Folkestone MCZ survey
Daily Progress Report No.7	Location: Dover Marina
Date: 24/08/2016	

Safety

	Today	To Date
Accidents/Incidents	0	0
Near Misses	0	0
Safety Drills/Induction	2	6
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
08:00	09:00	Transit	
09:00	17:00	Grab survey	
16:45	17:15	Transit	
17:15	18:00	Sample processing	

Weather

Weather/sea state conditions	0000-0600	0600-1200	1200-1800	1800-2400	Remarks
Wind		Variable 3 or less	Easterly 3		
Sea state		Smooth or slight	Smooth or slight		
Swell		0.34m (Folkestone)	0.25m (Folkestone)		
Visibility		Moderate or good, occasionally poor	Good		

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob		06:00	
Offshore Calibrations			
Total Operation (Camera) Survey (TOSu)		19:00	
Total Operation (Grab) Sampling (TOSa)	08:00	16:30	
Equipment/Downtime		05:00	
Ship/Plant Downtime		36:00	
Waiting On Weather			
Transit	01:30	06:00	
Standby Port			
Demob		01:00	
Other	00:45	02:45	Sample processing
Total:	10:15	92:15	

Overall Progress Groundtruthing Samples

Action	Sites Total	Sites Complete	Remaining Sites	Remarks
(DOVD) Day Grab	48	36	12	Biota and PSA = 13 stations, PSA only = 4 stations No sample collected = 19
(DOVD) Drop Camera	40	32	8	
(DVFK) Day Grab)	54	49	5	
(DVFK) Drop Camera	30	30	0	

Weather forecast for the next 24 hours

Wind: Variable mainly northwesterly veering north easterly later 3 or 4. Sea state: Smooth or slight. Visibility: Moderate or good, occasionally poor.

Planned operation for the next 24 hours (00:00 to 24:00 on 24th August 2016)

We will aim to complete Day grab surveying in DOVD and DVFK MCZ

Agreed Changes to Scope/Survey operation priorities

No changes required

Comments

Vessel: Solent Guardian	Project: Dover to Deal/Folkestone MCZ survey
Daily Progress Report No.8	Location: Dover Marina
Date: 25/08/2016	

Safety

	Today	To Date
Accidents/Incidents	0	0
Near Misses	0	0
Safety Drills/Induction	0	6
Additional comments:		

Summary of operations 0000-2400

Time UTC (start)	Time UTC (end)	Type	Comments
07:30	08:00	Transit	
08:00	13:00	Grab survey	
13:00	13:30	Transit	
13:30	14:00	Personnel change	
14:00	14:30	Transit	
14:30	16:30	Grab survey	
16:30	17:15	Transit	
17:15	17:45	Re-fuel	
17:45	18:00	Sample processing	

Weather

Weather/sea state conditions	0000-0600	0600-1200	1200-1800	1800-2400	Remarks
Wind		Variable 3 or less	SSW 2-3		
Sea state		Smooth or slight	Smooth or slight		
Swell		0.18m (Folkestone)	0.20m (Folkestone)		
Visibility		Moderate or good, occasionally poor	Good		

Overall Progress

Type	Today (hh:mm)	Accum (hh:mm)	Remarks
Mob		06:00	
Offshore Calibrations			
Total Operation (Camera) Survey (TOSu)		19:00	
Total Operation (Grab) Sampling (TOSa)	07:00	23:30	
Equipment/Downtime		05:00	
Ship/Plant Downtime		36:00	
Waiting On Weather			
Transit	02:15	08:15	
Standby Port			
Demob		01:00	
Other	01:45	04:30	Personnel change, re-fuelling and sample processing
Total:	11:00	103:15	

Overall Progress Groundtruthing Samples

Action	Sites Total	Sites Complete	Remaining Sites	Remarks
(DOVD) Day Grab	48	48	0	Biota and PSA = 21 stations, PSA only = 8 stations No sample collected = 19
(DOVD) Drop Camera	40	32	8	
(DVFK) Day Grab)	54	54	0	Biota and PSA = 41 stations, PSA only = 5 stations No sample collected = 8
(DVFK) Drop Camera	30	30	0	

Weather forecast for the next 24 hours

N/a

Planned operation for the next 24 hours (00:00 to 24:00 on 26th August 2016)

Samples will be collected by courier to be stored at Brampton

Agreed Changes to Scope/Survey operation priorities

No changes required

Comments

7.7 Video Survey Metadata

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
17/08/2016	07:49	DVFK_044	51.09911	1.26009	1	5407	DVFK_2GDK70816_GT044_STN_1_A1_0001	11.40	0.54
17/08/2016	07:49	DVFK_044	51.09906	1.26014	1	5408	DVFK_2GDK70816_GT044_STN_1_A1_0002	11.65	0.87
17/08/2016	07:50	DVFK_044	51.09905	1.26051	1	5409	DVFK_2GDK70816_GT044_STN_1_A1_0003	11.71	1.16
17/08/2016	07:52	DVFK_044	51.09901	1.26110	1	5410	DVFK_2GDK70816_GT044_STN_1_A1_0004	12.25	0.90
17/08/2016	07:52	DVFK_044	-	-	1	-	DVFK_2GDK70816_GT044_STN_1_A1_0005	-	-
17/08/2016	07:53	DVFK_044	-	-	1	-	DVFK_2GDK70816_GT044_STN_1_A1_0006	12.77	0.97
17/08/2016	07:53	DVFK_044	51.09909	1.26165	1	5411	DVFK_2GDK70816_GT044_STN_1_A1_0007	12.77	0.97
17/08/2016	07:53	DVFK_044	51.09911	1.26173	1	5412	DVFK_2GDK70816_GT044_STN_1_A1_0008	12.73	0.84
17/08/2016	07:54	DVFK_044	51.09912	1.26182	1	5413	DVFK_2GDK70816_GT044_STN_1_A1_0009	12.78	0.73
17/08/2016	07:54	DVFK_044	51.09912	1.26197	1	5414	DVFK_2GDK70816_GT044_STN_1_A1_0010	12.57	0.95
17/08/2016	07:54	DVFK_044	51.09916	1.26210	1	5415	DVFK_2GDK70816_GT044_STN_1_A1_0011	12.29	1.16
17/08/2016	07:55	DVFK_044	51.09919	1.26230	1	5416	DVFK_2GDK70816_GT044_STN_1_A1_0012	12.42	1.21
17/08/2016	07:55	DVFK_044	51.09924	1.26259	1	5417	DVFK_2GDK70816_GT044_STN_1_A1_0013	12.92	0.96
17/08/2016	08:00	DVFK_036	51.09677	1.26253	2	5418	DVFK_2GDK70816_GT036_STN_2_A1_0014	19.31	1.58
17/08/2016	08:01	DVFK_036	51.09681	1.26225	2	5419	DVFK_2GDK70816_GT036_STN_2_A1_0015	19.29	1.09
17/08/2016	08:01	DVFK_036	51.09680	1.26204	2	5420	DVFK_2GDK70816_GT036_STN_2_A1_0016	19.03	1.05
17/08/2016	08:03	DVFK_036	51.09690	1.26118	2	5421	DVFK_2GDK70816_GT036_STN_2_A1_0017	18.73	0.75
17/08/2016	08:04	DVFK_036	51.09690	1.26093	2	5422	DVFK_2GDK70816_GT036_STN_2_A1_0018	18.76	1.45
17/08/2016	08:04	DVFK_036	51.09691	1.26091	2	5423	DVFK_2GDK70816_GT036_STN_2_A1_0019	18.73	1.23
17/08/2016	08:04	DVFK_036	51.09697	1.26074	2	5424	DVFK_2GDK70816_GT036_STN_2_A1_0020	18.75	0.85
17/08/2016	08:05	DVFK_036	51.09700	1.26062	2	5425	DVFK_2GDK70816_GT036_STN_2_A1_0021	18.35	0.73
17/08/2016	08:05	DVFK_036	51.09701	1.26033	2	5426	DVFK_2GDK70816_GT036_STN_2_A1_0022	18.25	1.07
17/08/2016	08:06	DVFK_036	51.09713	1.25992	2	5427	DVFK_2GDK70816_GT036_STN_2_A1_0023	18.44	0.65
17/08/2016	08:12	DVFK_035	51.09501	1.26326	3	5428	DVFK_2GDK70816_GT035_STN_3_A1_0024	23.46	1.14

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
17/08/2016	08:13	DVFK_035	51.09506	1.26304	3	5429	DVFK_2GDK70816_GT035_STN_3_A1_0025	22.88	1.26
17/08/2016	08:13	DVFK_035	51.09510	1.26281	3	5430	DVFK_2GDK70816_GT035_STN_3_A1_0026	22.36	0.91
17/08/2016	08:14	DVFK_035	51.09512	1.26263	3	5431	DVFK_2GDK70816_GT035_STN_3_A1_0027	22.38	1.16
17/08/2016	08:15	DVFK_035	51.09517	1.26230	3	5432	DVFK_2GDK70816_GT035_STN_3_A1_0028	21.84	1.05
17/08/2016	08:15	DVFK_035	51.09518	1.26210	3	5433	DVFK_2GDK70816_GT035_STN_3_A1_0029	21.41	0.94
17/08/2016	08:16	DVFK_035	51.09519	1.26194	3	5434	DVFK_2GDK70816_GT035_STN_3_A1_0030	21.44	0.91
17/08/2016	08:16	DVFK_035	51.09526	1.26154	3	5435	DVFK_2GDK70816_GT035_STN_3_A1_0031	20.67	1.19
17/08/2016	08:17	DVFK_035	51.09529	1.26134	3	5436	DVFK_2GDK70816_GT035_STN_3_A1_0032	20.37	0.49
17/08/2016	08:18	DVFK_035	51.09527	1.26114	3	5437	DVFK_2GDK70816_GT035_STN_3_A1_0033	19.82	1.27
17/08/2016	08:18	DVFK_035	51.09531	1.26101	3	5438	DVFK_2GDK70816_GT035_STN_3_A1_0034	19.49	1.11
17/08/2016	08:18	DVFK_035	51.09535	1.26087	3	5439	DVFK_2GDK70816_GT035_STN_3_A1_0035	19.14	0.94
17/08/2016	08:19	DVFK_035	51.09539	1.26066	3	5440	Extra Fix	19.43	0.77
17/08/2016	08:27	DVFK_055	51.09492	1.25891	4	5441	DVFK_2GDK70816_GT055_STN_4_A1_0036	18.74	1.44
17/08/2016	08:28	DVFK_055	51.09497	1.25820	4	5442	DVFK_2GDK70816_GT055_STN_4_A1_0037	18.34	0.62
17/08/2016	08:29	DVFK_055	51.09499	1.25808	4	5443	DVFK_2GDK70816_GT055_STN_4_A1_0038	18.09	1.10
17/08/2016	08:29	DVFK_055	51.09501	1.25788	4	5444	DVFK_2GDK70816_GT055_STN_4_A1_0039	17.74	0.88
17/08/2016	08:30	DVFK_055	51.09502	1.25774	4	5445	DVFK_2GDK70816_GT055_STN_4_A1_0040	17.58	0.9
17/08/2016	08:30	DVFK_055	51.09504	1.25751	4	5446	DVFK_2GDK70816_GT055_STN_4_A1_0041	17.67	0.88
17/08/2016	08:31	DVFK_055	51.09505	1.25727	4	5447	DVFK_2GDK70816_GT055_STN_4_A1_0042	17.81	0.85
17/08/2016	08:31	DVFK_055	51.09508	1.25709	4	5448	Extra Fix	17.92	0.94
17/08/2016	08:32	DVFK_055	51.09509	1.25689	4	5449	DVFK_2GDK70816_GT055_STN_4_A1_0043	17.39	0.91
17/08/2016	08:32	DVFK_055	51.09512	1.25671	4	5450	Extra Fix	17.34	0.84
17/08/2016	08:33	DVFK_055	51.09511	1.25657	4	5451	DVFK_2GDK70816_GT055_STN_4_A1_0044	17.37	0.47
17/08/2016	08:33	DVFK_055	51.09513	1.25655	4	5452	DVFK_2GDK70816_GT055_STN_4_A1_0045	17.44	0.84
17/08/2016	08:33	DVFK_055	51.09513	1.25647	4	5453	DVFK_2GDK70816_GT055_STN_4_A1_0046	17.66	0.39
17/08/2016	08:39	DVFK_037	51.09611	1.25707	5	5454	No Images taken	17.95	0.82
17/08/2016	08:40	DVFK_037	51.09615	1.25690	5	5455	No Images taken	17.78	0.81

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
17/08/2016	08:40	DVFK_037	51.09623	1.25667	5	5456	No Images taken	17.78	0.96
17/08/2016	08:42	DVFK_037	51.09639	1.25610	5	5457	No Images taken	17.92	0.70
17/08/2016	08:42	DVFK_037	51.09641	1.25601	5	5458	No Images taken	17.98	0.87
17/08/2016	08:43	DVFK_037	51.09642	1.25570	5	5459	No Images taken	17.84	0.97
17/08/2016	08:44	DVFK_037	51.09645	1.25554	5	5460	No Images taken	17.21	0.84
17/08/2016	08:44	DVFK_037	51.09644	1.25543	5	5461	No Images taken	16.89	0.55
17/08/2016	08:45	DVFK_037	51.09645	1.25527	5	5462	No Images taken	16.61	0.92
17/08/2016	08:46	DVFK_037	51.09642	1.25501	5	5463	No Images taken	16.66	0.64
17/08/2016	08:46	DVFK_037	51.09641	1.25491	5	5464	No Images taken	16.94	0.73
17/08/2016	08:46	DVFK_037	51.09640	1.25477	5	5465	No Images taken	16.85	0.51
17/08/2016	08:50	DVFK_034	51.09690	1.25379	6	5466	DVFK_2GDK70816_GT034_STN_6_A1_0059	15.82	0.80
17/08/2016	08:51	DVFK_034	51.09700	1.25349	6	5467	DVFK_2GDK70816_GT034_STN_6_A1_0060	15.13	0.64
17/08/2016	08:52	DVFK_034	51.09703	1.25335	6	5468	DVFK_2GDK70816_GT034_STN_6_A1_0061	15.32	0.69
17/08/2016	08:52	DVFK_034	51.09709	1.25314	6	5469	DVFK_2GDK70816_GT034_STN_6_A1_0062	15.13	0.73
17/08/2016	08:53	DVFK_034	51.09708	1.25290	6	5470	DVFK_2GDK70816_GT034_STN_6_A1_0063	15.00	0.66
17/08/2016	08:54	DVFK_034	51.09709	1.25267	6	5471	DVFK_2GDK70816_GT034_STN_6_A1_0064	14.15	0.65
17/08/2016	08:55	DVFK_034	51.09708	1.25247	6	5472	DVFK_2GDK70816_GT034_STN_6_A1_0065	14.09	0.76
17/08/2016	08:56	DVFK_034	51.09705	1.25217	6	5473	DVFK_2GDK70816_GT034_STN_6_A1_0066	13.99	1.11
17/08/2016	08:57	DVFK_034	51.09709	1.25206	6	5474	DVFK_2GDK70816_GT034_STN_6_A1_0067	13.75	0.9
17/08/2016	08:57	DVFK_034	51.09707	1.25191	6	5475	DVFK_2GDK70816_GT034_STN_6_A1_0068	13.68	0.56
17/08/2016	08:57	DVFK_034	51.09708	1.25190	6	5476	DVFK_2GDK70816_GT034_STN_6_A1_0069	13.63	0.57
17/08/2016	08:58	DVFK_034	51.09705	1.25166	6	5477	Extra Fix	14.12	0.66
17/08/2016	09:00	DVFK_043	51.09700	1.25118	7	5478	DVFK_2GDK70816_GT043_STN_7_A1_0070	13.15	0.31
17/08/2016	09:00	DVFK_043	51.09708	1.25125	7	5479	DVFK_2GDK70816_GT043_STN_7_A1_0071	13.18	0.82
17/08/2016	09:01	DVFK_043	51.09708	1.25106	7	5480	DVFK_2GDK70816_GT043_STN_7_A1_0072	12.79	0.50
17/08/2016	09:02	DVFK_043	51.09711	1.25086	7	5481	DVFK_2GDK70816_GT043_STN_7_A1_0073	12.48	0.72
17/08/2016	09:03	DVFK_043	51.09713	1.25070	7	5482	DVFK_2GDK70816_GT043_STN_7_A1_0074	12.2	0.68

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
17/08/2016	09:03	DVFK_043	51.09715	1.25046	7	5483	DVFK_2GDK70816_GT043_STN_7_A1_0075	12.68	0.73
17/08/2016	09:04	DVFK_043	51.09720	1.25026	7	5484	DVFK_2GDK70816_GT043_STN_7_A1_0076	12.31	0.72
17/08/2016	09:05	DVFK_043	51.09723	1.24997	7	5485	DVFK_2GDK70816_GT043_STN_7_A1_0077	12.18	1.19
17/08/2016	09:06	DVFK_043	51.09726	1.24976	7	5486	DVFK_2GDK70816_GT043_STN_7_A1_0078	11.85	0.56
17/08/2016	09:07	DVFK_043	51.09727	1.24967	7	5487	DVFK_2GDK70816_GT043_STN_7_A1_0079	11.88	0.55
17/08/2016	09:08	DVFK_043	51.09735	1.24938	7	5488	DVFK_2GDK70816_GT043_STN_7_A1_0080	11.49	0.77
17/08/2016	09:09	DVFK_043	51.09738	1.24916	7	5489	DVFK_2GDK70816_GT043_STN_7_A1_0081	11.80	0.38
17/08/2016	09:09	DVFK_043	51.09745	1.24905	7	5490	Extra Fix	11.32	0.89
17/08/2016	09:14	DVFK_042	51.09656	1.24902	8	5491	DVFK_2GDK70816_GT042_STN_8_A1_0082	13.47	0.86
17/08/2016	09:14	DVFK_042	51.09656	1.24883	8	5492	DVFK_2GDK70816_GT042_STN_8_A1_0083	13.59	0.52
17/08/2016	09:15	DVFK_042	51.09658	1.24869	8	5493	DVFK_2GDK70816_GT042_STN_8_A1_0084	13.40	0.70
17/08/2016	09:15	DVFK_042	51.09657	1.24847	8	5494	DVFK_2GDK70816_GT042_STN_8_A1_0085	13.37	1.08
17/08/2016	09:16	DVFK_042	51.09663	1.24821	8	5495	DVFK_2GDK70816_GT042_STN_8_A1_0086	12.98	0.67
17/08/2016	09:17	DVFK_042	51.09663	1.24791	8	5496	DVFK_2GDK70816_GT042_STN_8_A1_0087	12.82	1.24
17/08/2016	09:18	DVFK_042	51.09671	1.24783	8	5497	DVFK_2GDK70816_GT042_STN_8_A1_0088	12.56	0.70
17/08/2016	09:19	DVFK_042	51.09670	1.24741	8	5498	DVFK_2GDK70816_GT042_STN_8_A1_0089	12.36	0.93
17/08/2016	09:21	DVFK_042	51.09676	1.24705	8	5499	DVFK_2GDK70816_GT042_STN_8_A1_0090	11.38	0.57
17/08/2016	09:21	DVFK_042	51.09677	1.24690	8	5500	DVFK_2GDK70816_GT042_STN_8_A1_0091	11.33	0.58
17/08/2016	09:25	DVFK_041	51.09710	1.24507	9	5501	DVFK_2GDK70816_GT041_STN_9_A1_0092	11.08	0.98
17/08/2016	09:26	DVFK_041	51.09719	1.24483	9	5502	DVFK_2GDK70816_GT041_STN_9_A1_0093	10.85	0.62
17/08/2016	09:27	DVFK_041	51.09725	1.24445	9	5503	DVFK_2GDK70816_GT041_STN_9_A1_0094	10.87	0.49
17/08/2016	09:27	DVFK_041	51.09722	1.24432	9	5504	DVFK_2GDK70816_GT041_STN_9_A1_0095	10.47	0.62
17/08/2016	09:28	DVFK_041	51.09718	1.24414	9	5505	DVFK_2GDK70816_GT041_STN_9_A1_0096	10.51	0.68
17/08/2016	09:28	DVFK_041	51.09722	1.24406	9	5506	DVFK_2GDK70816_GT041_STN_9_A1_0097	11.09	0.57
17/08/2016	09:28	DVFK_041	51.09722	1.24404	9	5507	DVFK_2GDK70816_GT041_STN_9_A1_0098	11.10	0.70
17/08/2016	09:28	DVFK_041	51.09723	1.24403	9	5508	DVFK_2GDK70816_GT041_STN_9_A1_0099	11.29	0.59
17/08/2016	09:30	DVFK_041	51.09724	1.24357	9	5509	DVFK_2GDK70816_GT041_STN_9_A1_0100	11.79	0.67

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
17/08/2016	09:31	DVFK_041	51.09727	1.24351	9	5510	DVFK_2GDK70816_GT041_STN_9_A1_0101	11.49	0.51
17/08/2016	09:31	DVFK_041	51.09730	1.24345	9	5511	DVFK_2GDK70816_GT041_STN_9_A1_0102	11.94	0.75
17/08/2016	09:32	DVFK_041	51.09730	1.24318	9	5512	DVFK_2GDK70816_GT041_STN_9_A1_0103	11.65	0.75
17/08/2016	09:32	DVFK_041	51.09726	1.24308	9	5513	DVFK_2GDK70816_GT041_STN_9_A1_0104	11.53	1.02
17/08/2016	09:33	DVFK_041	51.09735	1.24297	9	5514	Extra Fix	12.04	0.46
17/08/2016	09:39	DVFK_040	51.09626	1.23613	10	5515	DVFK_2GDK70816_GT040_STN_10_A1_0105	13.18	1.29
17/08/2016	09:40	DVFK_040	51.09608	1.23653	10	5516	DVFK_2GDK70816_GT040_STN_10_A1_0106	13.07	0.84
17/08/2016	09:40	DVFK_040	51.09599	1.23677	10	5517	DVFK_2GDK70816_GT040_STN_10_A1_0107	12.79	1.44
17/08/2016	09:41	DVFK_040	51.09595	1.23700	10	5518	DVFK_2GDK70816_GT040_STN_10_A1_0108	13.21	1.20
17/08/2016	09:42	DVFK_040	51.09597	1.23757	10	5519	DVFK_2GDK70816_GT040_STN_10_A1_0109	13.24	1.02
17/08/2016	09:43	DVFK_040	51.09601	1.23782	10	5520	DVFK_2GDK70816_GT040_STN_10_A1_0110	13.37	1.33
17/08/2016	09:43	DVFK_040	51.09601	1.23802	10	5521	DVFK_2GDK70816_GT040_STN_10_A1_0111	13.75	1.17
17/08/2016	09:43	DVFK_040	51.09600	1.23829	10	5522	DVFK_2GDK70816_GT040_STN_10_A1_0112	13.56	1.18
17/08/2016	09:44	DVFK_040	51.09606	1.23866	10	5523	DVFK_2GDK70816_GT040_STN_10_A1_0113	13.77	0.59
17/08/2016	09:50	DVFK_033	51.09615	1.23668	11	5524	DVFK_2GDK70816_GT033_STN_11_A1_0114	12.83	0.88
17/08/2016	09:52	DVFK_033	51.09625	1.23604	11	5525	DVFK_2GDK70816_GT033_STN_11_A1_0115	12.66	0.65
17/08/2016	10:13	DVFK_080_A1	51.08096	1.22292	12	5526	No Images taken	22.44	1.12
17/08/2016	10:13	DVFK_080_A1	51.08086	1.22283	12	5527	DVFK_2GDK70816_GT080_STN_12_A1_0116	22.59	0.41
17/08/2016	10:15	DVFK_080_A1	51.08088	1.22260	12	5528	No Images taken	21.92	1.14
17/08/2016	10:33	DVFK_080_A2/A3	51.08094	1.22064	12	5529	No Images taken	22.36	1.45
17/08/2016	10:58	DVFK_084	51.07062	1.16508	13	5530	DVFK_2GDK70816_GT084_STN_13_A1_0117	11.73	1.46
17/08/2016	10:58	DVFK_084	51.07059	1.16524	13	5531	Extra Fix	12.02	1.12
17/08/2016	10:59	DVFK_084	51.07053	1.16551	13	5532	Extra Fix	12.19	1.29
17/08/2016	10:59	DVFK_084	51.07052	1.16562	13	5533	DVFK_2GDK70816_GT084_STN_13_A1_0118	12.26	1.28
17/08/2016	11:00	DVFK_084	51.07055	1.16606	13	5534	DVFK_2GDK70816_GT084_STN_13_A1_0119	11.24	1.23
17/08/2016	11:07	DVFK_084_A2	51.07042	1.16836	13	5535	Extra Fix	12.30	1.57
17/08/2016	11:08	DVFK_084_A2	51.07054	1.16875	13	5536	Extra Fix	10.82	1.65

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
17/08/2016	11:08	DVFK_084_A2	51.07059	1.16891	13	5537	DVFK_2GDK70816_GT084_STN_13_A2_0120	11.79	1.50
17/08/2016	11:08	DVFK_084_A2	51.07066	1.16907	13	5538	Extra Fix	10.68	1.42
17/08/2016	11:14	DVFK_083	51.07043	1.17439	14	5539	Extra Fix	12.19	1.52
17/08/2016	11:14	DVFK_083	51.07051	1.17463	14	5540	DVFK_2GDK70816_GT083_STN_14_A1_0121	12.06	1.64
17/08/2016	11:15	DVFK_083	51.07074	1.17505	14	5541	DVFK_2GDK70816_GT083_STN_14_A1_0122	11.87	2.05
17/08/2016	11:15	DVFK_083	51.07085	1.17530	14	5542	DVFK_2GDK70816_GT083_STN_14_A1_0123	10.53	1.18
17/08/2016	11:16	DVFK_083	51.07106	1.17573	14	5543	Extra Fix	10.32	2.44
17/08/2016	11:20	DVFK_082	51.07174	1.17919	15	5544	Extra Fix	9.00	1.27
17/08/2016	11:21	DVFK_082	51.07185	1.17960	15	5545	DVFK_2GDK70816_GT082_STN_15_A1_0124	9.67	1.81
17/08/2016	11:22	DVFK_082	51.07193	1.18006	15	5546	DVFK_2GDK70816_GT082_STN_15_A1_0125	10.72	1.97
17/08/2016	11:22	DVFK_082	51.07196	1.18057	15	5547	DVFK_2GDK70816_GT082_STN_15_A1_0126	10.36	1.57
17/08/2016	11:23	DVFK_082	51.07203	1.18084	15	5548	Extra Fix	10.32	1.58
17/08/2016	11:23	DVFK_082	51.07213	1.18111	15	5549	DVFK_2GDK70816_GT082_STN_15_A1_0127	10.70	1.90
17/08/2016	11:24	DVFK_082	51.07230	1.18151	15	5550	Extra Fix	13.70	1.31
17/08/2016	11:35	DVFK_038	51.08052	1.21364	16	5551	Extra Fix	18.49	2.35
17/08/2016	11:36	DVFK_038	51.08080	1.21422	16	5552	DVFK_2GDK70816_GT038_STN_16_A1_0128	17.66	2.39
17/08/2016	11:37	DVFK_038	51.08122	1.21493	16	5553	DVFK_2GDK70816_GT038_STN_16_A1_0129	16.57	2.61
17/08/2016	11:37	DVFK_038	51.08149	1.21531	16	5554	Extra Fix	15.42	2.33
17/08/2016	12:19	DVFK_053	51.10226	1.27316	17	5555	DVFK_2GDK70816_GT053_STN_17_A1_0130	11.57	1.02
17/08/2016	12:19	DVFK_053	51.10227	1.27324	17	5556	DVFK_2GDK70816_GT053_STN_17_A1_0131	11.84	1.01
17/08/2016	12:19	DVFK_053	51.10230	1.27336	17	5557	DVFK_2GDK70816_GT053_STN_17_A1_0132	11.27	1.00
17/08/2016	12:20	DVFK_053	51.10235	1.27356	17	5558	DVFK_2GDK70816_GT053_STN_17_A1_0133	11.89	0.74
17/08/2016	12:21	DVFK_053	51.10238	1.27399	17	5559	DVFK_2GDK70816_GT053_STN_17_A1_0134	12.00	0.94
17/08/2016	12:22	DVFK_053	51.10249	1.27428	17	5560	DVFK_2GDK70816_GT053_STN_17_A1_0135	11.45	0.91
17/08/2016	12:22	DVFK_053	51.10256	1.27452	17	5561	DVFK_2GDK70816_GT053_STN_17_A1_0136	11.07	0.68
17/08/2016	12:23	DVFK_053	51.10262	1.27470	17	5562	DVFK_2GDK70816_GT053_STN_17_A1_0137	11.55	0.82
17/08/2016	12:24	DVFK_053	51.10270	1.27503	17	5563	DVFK_2GDK70816_GT053_STN_17_A1_0138	11.32	1.09

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
17/08/2016	12:24	DVFK_053	51.10276	1.27509	17	5564	DVFK_2GDK70816_GT053_STN_17_A1_0139	10.90	0.87
17/08/2016	12:25	DVFK_053	51.10284	1.27522	17	5565	Extra Fix	10.96	1.27
17/08/2016	12:30	DVFK_045	51.10374	1.27985	18	5566	DVFK_2GDK70816_GT045_STN_18_A1_0140	12.86	0.86
17/08/2016	12:30	DVFK_045	51.10375	1.27990	18	5567	DVFK_2GDK70816_GT045_STN_18_A1_0141	12.82	0.74
17/08/2016	12:31	DVFK_045	51.10376	1.28029	18	5568	DVFK_2GDK70816_GT045_STN_18_A1_0142	13.1	0.67
17/08/2016	12:31	DVFK_045	51.10380	1.28048	18	5569	DVFK_2GDK70816_GT045_STN_18_A1_0143	13.37	1.09
17/08/2016	12:33	DVFK_045	51.10391	1.28113	18	5570	DVFK_2GDK70816_GT045_STN_18_A1_0144	13.12	0.79
17/08/2016	12:33	DVFK_045	51.10396	1.28124	18	5571	DVFK_2GDK70816_GT045_STN_18_A1_0145	12.92	0.83
17/08/2016	12:34	DVFK_045	51.10408	1.28141	18	5572	DVFK_2GDK70816_GT045_STN_18_A1_0146	12.81	1.05
17/08/2016	12:35	DVFK_045	51.10415	1.28169	18	5573	DVFK_2GDK70816_GT045_STN_18_A1_0147	12.97	1.21
17/08/2016	12:35	DVFK_045	51.10412	1.28197	18	5574	DVFK_2GDK70816_GT045_STN_18_A1_0148	12.98	1.12
17/08/2016	12:36	DVFK_045	51.10415	1.28227	18	5575	DVFK_2GDK70816_GT045_STN_18_A1_0149	12.98	0.88
17/08/2016	12:49	DVFK_046	51.10423	1.28665	19	5576	DVFK_2GDK70816_GT046_STN_19_A1_0150	15.09	1.07
17/08/2016	12:50	DVFK_046	51.10423	1.28684	19	5577	DVFK_2GDK70816_GT046_STN_19_A1_0151	15.34	1.32
17/08/2016	12:50	DVFK_046	51.10423	1.28698	19	5578	DVFK_2GDK70816_GT046_STN_19_A1_0152	15.46	1.31
17/08/2016	12:51	DVFK_046	51.10426	1.28750	19	5579	DVFK_2GDK70816_GT046_STN_19_A1_0153	15.88	1.12
17/08/2016	12:51	DVFK_046	51.10426	1.28768	19	5580	DVFK_2GDK70816_GT046_STN_19_A1_0154	16.05	0.87
17/08/2016	12:52	DVFK_046	51.10426	1.28780	19	5581	DVFK_2GDK70816_GT046_STN_19_A1_0155	16.30	1.16
17/08/2016	12:52	DVFK_046	51.10424	1.28799	19	5582	DVFK_2GDK70816_GT046_STN_19_A1_0156	16.28	1.09
17/08/2016	12:52	DVFK_046	51.10424	1.28808	19	5583	DVFK_2GDK70816_GT046_STN_19_A1_0157	16.66	1.05
17/08/2016	12:52	DVFK_046	51.10423	1.28814	19	5584	DVFK_2GDK70816_GT046_STN_19_A1_0158	16.7	1.08
17/08/2016	12:53	DVFK_046	51.10419	1.28860	19	5585	DVFK_2GDK70816_GT046_STN_19_A1_0159	17.56	1.23
17/08/2016	12:54	DVFK_046	51.10415	1.28885	19	5586	DVFK_2GDK70816_GT046_STN_19_A1_0160	17.72	1.20
17/08/2016	13:02	DVFK_047	51.10887	1.30009	20	5587	DVFK_2GDK70816_GT047_STN_20_A1_0161	11.01	0.83
17/08/2016	13:02	DVFK_047	51.10886	1.30015	20	5588	DVFK_2GDK70816_GT047_STN_20_A1_0162	10.85	0.87
17/08/2016	13:02	DVFK_047	51.10883	1.30026	20	5589	DVFK_2GDK70816_GT047_STN_20_A1_0163	11.15	0.74
17/08/2016	13:03	DVFK_047	51.10887	1.30042	20	5590	DVFK_2GDK70816_GT047_STN_20_A1_0164	11.06	0.91

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
17/08/2016	13:03	DVFK_047	51.10889	1.30053	20	5591	DVFK_2GDK70816_GT047_STN_20_A1_0165	11.78	1.27
17/08/2016	13:04	DVFK_047	51.10880	1.30093	20	5592	DVFK_2GDK70816_GT047_STN_20_A1_0166	11.66	0.72
17/08/2016	13:04	DVFK_047	51.10876	1.30098	20	5593	DVFK_2GDK70816_GT047_STN_20_A1_0167	11.63	0.78
17/08/2016	13:05	DVFK_047	51.10878	1.30116	20	5594	Extra Fix	11.32	1.01
17/08/2016	13:05	DVFK_047	51.10880	1.30134	20	5595	DVFK_2GDK70816_GT047_STN_20_A1_0168	11.13	1.14
17/08/2016	13:06	DVFK_047	51.10881	1.30172	20	5596	Extra Fix	11.79	0.96
17/08/2016	13:06	DVFK_047	51.10882	1.30176	20	5597	DVFK_2GDK70816_GT047_STN_20_A1_0169	11.62	1.10
17/08/2016	13:06	DVFK_047	51.10883	1.30188	20	5598	DVFK_2GDK70816_GT047_STN_20_A1_0170	11.19	1.19
17/08/2016	13:07	DVFK_047	51.10881	1.30207	20	5599	DVFK_2GDK70816_GT047_STN_20_A1_0171	11.86	1.19
17/08/2016	13:07	DVFK_047	51.10879	1.30221	20	5600	DVFK_2GDK70816_GT047_STN_20_A1_0172	13.00	1.09
17/08/2016	13:10	DVFK_048	51.10857	1.30302	21	5601	Extra Fix	14.38	0.80
17/08/2016	13:11	DVFK_048	51.10855	1.30308	21	5602	DVFK_2GDK70816_GT048_STN_21_A1_0173	14.6	0.75
17/08/2016	13:11	DVFK_048	51.10856	1.30315	21	5603	DVFK_2GDK70816_GT048_STN_21_A1_0174	14.77	0.49
17/08/2016	13:12	DVFK_048	51.10857	1.30344	21	5604	DVFK_2GDK70816_GT048_STN_21_A1_0175	14.9	0.87
17/08/2016	13:13	DVFK_048	51.10855	1.30370	21	5605	DVFK_2GDK70816_GT048_STN_21_A1_0176	15.51	0.87
17/08/2016	13:13	DVFK_048	51.10859	1.30395	21	5606	DVFK_2GDK70816_GT048_STN_21_A1_0177	16.05	1.20
17/08/2016	13:14	DVFK_048	51.10857	1.30450	21	5607	Extra Fix	16.83	0.98
17/08/2016	13:15	DVFK_048	51.10859	1.30465	21	5608	Extra Fix	17.03	0.86
17/08/2016	13:15	DVFK_048	51.10860	1.30475	21	5609	Extra Fix	17.22	0.64
17/08/2016	13:17	DVFK_052	51.10859	1.30555	22	5610	DVFK_2GDK70816_GT052_STN_22_A1_0178	17.51	0.98
17/08/2016	13:18	DVFK_052	51.10853	1.30578	22	5611	DVFK_2GDK70816_GT052_STN_22_A1_0179	18.74	1.00
17/08/2016	13:18	DVFK_052	51.10854	1.30596	22	5612	DVFK_2GDK70816_GT052_STN_22_A1_0180	18.76	1.09
17/08/2016	13:19	DVFK_052	51.10855	1.30654	22	5613	DVFK_2GDK70816_GT052_STN_22_A1_0181	19.73	0.98
17/08/2016	13:20	DVFK_052	51.10857	1.30674	22	5614	DVFK_2GDK70816_GT052_STN_22_A1_0182	20.05	0.85
17/08/2016	13:20	DVFK_052	51.10858	1.30683	22	5615	DVFK_2GDK70816_GT052_STN_22_A1_0183	19.88	0.66
17/08/2016	13:20	DVFK_052	51.10857	1.30686	22	5616	DVFK_2GDK70816_GT052_STN_22_A1_0184	19.81	0.7
17/08/2016	13:21	DVFK_052	51.10857	1.30693	22	5617	DVFK_2GDK70816_GT052_STN_22_A1_0185	19.78	0.73

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
17/08/2016	13:21	DVFK_052	51.10859	1.30708	22	5618	DVFK_2GDK70816_GT052_STN_22_A1_0186	19.81	1.12
17/08/2016	13:21	DVFK_052	51.10860	1.30716	22	5619	Extra Fix	19.81	1.00
17/08/2016	13:38	DVFK_049	51.10500	1.32141	23	5620	DVFK_2GDK70816_GT049_STN_23_A1_0187	19.25	1.43
17/08/2016	13:39	DVFK_049	51.10500	1.32152	23	5621	DVFK_2GDK70816_GT049_STN_23_A1_0188	19.14	1.35
17/08/2016	13:39	DVFK_049	51.10500	1.32172	23	5622	DVFK_2GDK70816_GT049_STN_23_A1_0189	19.37	1.37
17/08/2016	13:40	DVFK_049	51.10505	1.32226	23	5623	DVFK_2GDK70816_GT049_STN_23_A1_0190	19.32	1.04
17/08/2016	13:40	DVFK_049	51.10505	1.32232	23	5624	DVFK_2GDK70816_GT049_STN_23_A1_0191	19.49	1.06
17/08/2016	13:40	DVFK_049	51.10504	1.32256	23	5625	DVFK_2GDK70816_GT049_STN_23_A1_0192	19.12	1.35
17/08/2016	13:41	DVFK_049	51.10501	1.32292	23	5626	DVFK_2GDK70816_GT049_STN_23_A1_0193	19.05	1.21
17/08/2016	13:41	DVFK_049	51.10498	1.32311	23	5627	DVFK_2GDK70816_GT049_STN_23_A1_0194	19.3	1.25
17/08/2016	13:42	DVFK_049	51.10494	1.32326	23	5628	DVFK_2GDK70816_GT049_STN_23_A1_0195	19.41	1.08
17/08/2016	13:42	DVFK_049	51.10483	1.32364	23	5629	DVFK_2GDK70816_GT049_STN_23_A1_0196	19.47	1.43
17/08/2016	13:43	DVFK_049	51.10471	1.32394	23	5630	Extra Fix	20.01	1.05
17/08/2016	13:47	DVFK_050	51.10460	1.32684	24	5631	DVFK_2GDK70816_GT050_STN_24_A1_0197	19.39	1.41
17/08/2016	13:47	DVFK_050	51.10458	1.32712	24	5632	DVFK_2GDK70816_GT050_STN_24_A1_0198	19.66	1.58
17/08/2016	13:48	DVFK_050	51.10455	1.32752	24	5633	DVFK_2GDK70816_GT050_STN_24_A1_0199	19.54	1.15
17/08/2016	13:50	DVFK_050	51.10456	1.32840	24	5634	DVFK_2GDK70816_GT050_STN_24_A1_0200	19.45	1.14
17/08/2016	13:50	DVFK_050	51.10455	1.32851	24	5635	DVFK_2GDK70816_GT050_STN_24_A1_0201	19.23	1.18
17/08/2016	13:51	DVFK_050	51.10451	1.32879	24	5636	DVFK_2GDK70816_GT050_STN_24_A1_0202	19.37	1.18
17/08/2016	13:51	DVFK_050	51.10448	1.32890	24	5637	DVFK_2GDK70816_GT050_STN_24_A1_0203	19.62	1.38
17/08/2016	13:51	DVFK_050	51.10440	1.32914	24	5638	DVFK_2GDK70816_GT050_STN_24_A1_0204	21.09	1.56
17/08/2016	13:52	DVFK_050	51.10429	1.32946	24	5639	Extra Fix	19.63	1.23
17/08/2016	13:52	DVFK_050	51.10425	1.32958	24	5640	Extra Fix	19.94	0.91
17/08/2016	13:59	DVFK_054	51.10324	1.32793	25	5641	DVFK_2GDK70816_GT054_STN_25_A1_0205	19.55	1.40
17/08/2016	13:59	DVFK_054	51.10323	1.32815	25	5642	DVFK_2GDK70816_GT054_STN_25_A1_0206	19.31	1.29
17/08/2016	13:59	DVFK_054	51.10323	1.32831	25	5643	DVFK_2GDK70816_GT054_STN_25_A1_0207	19.14	1.15
17/08/2016	14:00	DVFK_054	51.10324	1.32850	25	5644	DVFK_2GDK70816_GT054_STN_25_A1_0208	19.32	1.40

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
17/08/2016	14:02	DVFK_054	51.10305	1.32958	25	5645	DVFK_2GDK70816_GT054_STN_25_A1_0209	19.76	1.13
17/08/2016	14:02	DVFK_054	51.10303	1.32964	25	5646	DVFK_2GDK70816_GT054_STN_25_A1_0210	19.84	1.10
17/08/2016	14:02	DVFK_054	51.10300	1.32976	25	5647	DVFK_2GDK70816_GT054_STN_25_A1_0211	19.78	1.02
17/08/2016	14:03	DVFK_054	51.10299	1.32991	25	5648	DVFK_2GDK70816_GT054_STN_25_A1_0212	19.77	0.74
17/08/2016	14:03	DVFK_054	51.10300	1.32994	25	5649	DVFK_2GDK70816_GT054_STN_25_A1_0213	20.07	0.88
17/08/2016	14:03	DVFK_054	51.10302	1.33003	25	5650	Extra Fix	20.24	0.93
17/08/2016	14:03	DVFK_054	51.10296	1.33000	25	5651	Extra Fix	20.09	0.79
17/08/2016	14:11	DVFK_078	51.10358	1.33105	26	5652	DVFK_2GDK70816_GT078_STN_26_A1_0214	19.27	1.47
17/08/2016	14:11	DVFK_078	51.10359	1.33124	26	5653	DVFK_2GDK70816_GT078_STN_26_A1_0215	19.35	1.04
17/08/2016	14:11	DVFK_078	51.10358	1.33130	26	5654	DVFK_2GDK70816_GT078_STN_26_A1_0216	19.69	1.37
17/08/2016	14:12	DVFK_078	51.10351	1.33155	26	5655	DVFK_2GDK70816_GT078_STN_26_A1_0217	19.92	1.26
17/08/2016	14:12	DVFK_078	51.10350	1.33165	26	5656	DVFK_2GDK70816_GT078_STN_26_A1_0218	19.9	1.12
17/08/2016	14:12	DVFK_078	51.10349	1.33170	26	5657	DVFK_2GDK70816_GT078_STN_26_A1_0219	19.52	0.98
17/08/2016	14:13	DVFK_078	51.10347	1.33183	26	5658	DVFK_2GDK70816_GT078_STN_26_A1_0220	19.62	0.93
17/08/2016	14:13	DVFK_078	51.10346	1.33187	26	5659	DVFK_2GDK70816_GT078_STN_26_A1_0221	19.93	0.79
17/08/2016	14:13	DVFK_078	51.10344	1.33203	26	5660	DVFK_2GDK70816_GT078_STN_26_A1_0222	19.53	0.63
17/08/2016	14:13	DVFK_078	51.10345	1.33210	26	5661	DVFK_2GDK70816_GT078_STN_26_A1_0223	19.50	0.88
17/08/2016	14:14	DVFK_078	51.10329	1.33260	26	5662	DVFK_2GDK70816_GT078_STN_26_A1_0224	19.24	1.37
17/08/2016	14:15	DVFK_078	51.10321	1.33276	26	5663	DVFK_2GDK70816_GT078_STN_26_A1_0225	19.44	1.64
17/08/2016	14:15	DVFK_078	51.10317	1.33292	26	5664	DVFK_2GDK70816_GT078_STN_26_A1_0226	19.67	1.44
17/08/2016	14:23	DVFK_081	51.10154	1.33481	27	5665	DVFK_2GDK70816_GT081_STN_27_A1_0227	20.89	0.88
17/08/2016	14:25	DVFK_081	51.10163	1.33425	27	5666	DVFK_2GDK70816_GT081_STN_27_A1_0228	20.76	0.98
17/08/2016	14:25	DVFK_081	51.10160	1.33420	27	5667	DVFK_2GDK70816_GT081_STN_27_A1_0229	20.87	0.68
17/08/2016	14:25	DVFK_081	51.10159	1.33413	27	5668	DVFK_2GDK70816_GT081_STN_27_A1_0230	20.8	1.17
17/08/2016	14:25	DVFK_081	51.10162	1.33403	27	5669	DVFK_2GDK70816_GT081_STN_27_A1_0231	20.84	0.67
17/08/2016	14:26	DVFK_081	51.10166	1.33384	27	5670	DVFK_2GDK70816_GT081_STN_27_A1_0232	20.83	0.86
17/08/2016	14:27	DVFK_081	51.10167	1.33366	27	5671	DVFK_2GDK70816_GT081_STN_27_A1_0233	20.11	1.38

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
17/08/2016	14:27	DVFK_081	51.10173	1.33352	27	5672	DVFK_2GDK70816_GT081_STN_27_A1_0234	20.74	1.12
17/08/2016	14:28	DVFK_081	51.10179	1.33336	27	5673	DVFK_2GDK70816_GT081_STN_27_A1_0235	20.65	0.50
17/08/2016	14:28	DVFK_081	51.10180	1.33332	27	5674	DVFK_2GDK70816_GT081_STN_27_A1_0236	20.51	0.58
17/08/2016	14:28	DVFK_081	51.10179	1.33327	27	5675	DVFK_2GDK70816_GT081_STN_27_A1_0237	20.59	0.70
17/08/2016	14:29	DVFK_081	51.10181	1.33318	27	5676	Extra Fix	20.23	0.62
17/08/2016	14:35	DVFK_079	51.10498	1.33074	28	5677	DVFK_2GDK70816_GT079_STN_28_A1_0238	18.34	1.36
17/08/2016	14:35	DVFK_079	51.10499	1.33087	28	5678	DVFK_2GDK70816_GT079_STN_28_A1_0239	18.38	1.09
17/08/2016	14:36	DVFK_079	51.10498	1.33112	28	5679	DVFK_2GDK70816_GT079_STN_28_A1_0240	18.3	0.96
17/08/2016	14:36	DVFK_079	51.10494	1.33131	28	5680	DVFK_2GDK70816_GT079_STN_28_A1_0241	18.3	0.75
17/08/2016	14:36	DVFK_079	51.10494	1.33137	28	5681	DVFK_2GDK70816_GT079_STN_28_A1_0242	18.23	0.84
17/08/2016	14:37	DVFK_079	51.10495	1.33146	28	5682	DVFK_2GDK70816_GT079_STN_28_A1_0243	18.00	0.71
17/08/2016	14:37	DVFK_079	51.10495	1.33154	28	5683	DVFK_2GDK70816_GT079_STN_28_A1_0244	18.42	0.83
17/08/2016	14:38	DVFK_079	51.10490	1.33172	28	5684	DVFK_2GDK70816_GT079_STN_28_A1_0245	18.52	0.61
17/08/2016	14:38	DVFK_079	51.10490	1.33187	28	5685	DVFK_2GDK70816_GT079_STN_28_A1_0246	18.27	0.66
17/08/2016	14:38	DVFK_079	51.10488	1.33194	28	5686	DVFK_2GDK70816_GT079_STN_28_A1_0247	18.51	0.50
17/08/2016	14:39	DVFK_079	51.10496	1.33221	28	5687	DVFK_2GDK70816_GT079_STN_28_A1_0248	18.51	1.12
17/08/2016	14:40	DVFK_079	51.10499	1.33239	28	5688	DVFK_2GDK70816_GT079_STN_28_A1_0249	18.29	0.78
17/08/2016	14:40	DVFK_079	51.10493	1.33246	28	5689	DVFK_2GDK70816_GT079_STN_28_A1_0250	18.15	0.76
17/08/2016	14:40	DVFK_079	51.10493	1.33248	28	5690	DVFK_2GDK70816_GT079_STN_28_A1_0251	18.51	0.46
17/08/2016	14:41	DVFK_079	51.10502	1.33268	28	5691	DVFK_2GDK70816_GT079_STN_28_A1_0252	18.37	1.02
17/08/2016	14:42	DVFK_079	51.10493	1.33306	28	5692	Extra Fix	18.54	0.94
17/08/2016	14:43	DVFK_079	51.10489	1.33315	28	5693	Extra Fix	18.11	0.77
18/08/2016	13:09	DVFK47_A2	51.10896	1.30028	64	6058	DVFK_2GDK70816_GT047_STN_64_A2_0265	11.79	0.99
18/08/2016	13:09	DVFK47_A2	51.10901	1.30049	64	6059	DVFK_2GDK70816_GT047_STN_64_A2_0266	10.89	1.04
18/08/2016	13:09	DVFK47_A2	51.10901	1.30057	64	6060	DVFK_2GDK70816_GT047_STN_64_A2_0267	10.89	1.13
18/08/2016	13:10	DVFK47_A2	51.10902	1.30068	64	6061	DVFK_2GDK70816_GT047_STN_64_A2_0268	12.44	1.12
18/08/2016	13:10	DVFK47_A2	51.10902	1.30080	64	6062	DVFK_2GDK70816_GT047_STN_64_A2_0269	12.16	1.15

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
18/08/2016	13:10	DVFK47_A2	51.10900	1.30111	64	6063	DVFK_2GDK70816_GT047_STN_64_A2_0270	12.52	1.36
18/08/2016	13:11	DVFK47_A2	51.10899	1.30121	64	6064	DVFK_2GDK70816_GT047_STN_64_A2_0271	12.4	1.31
18/08/2016	13:11	DVFK47_A2	51.10899	1.30127	64	6065	DVFK_2GDK70816_GT047_STN_64_A2_0272	12.58	1.24
18/08/2016	13:11	DVFK47_A2	51.10900	1.30135	64	6066	DVFK_2GDK70816_GT047_STN_64_A2_0273	12.44	1.41
18/08/2016	13:11	DVFK47_A2	51.10901	1.30145	64	6067	DVFK_2GDK70816_GT047_STN_64_A2_0274	12.76	1.44
18/08/2016	13:11	DVFK47_A2	51.10902	1.30156	64	6068	DVFK_2GDK70816_GT047_STN_64_A2_0275	12.62	1.45
18/08/2016	13:12	DVFK47_A2	51.10902	1.30180	64	6069	DVFK_2GDK70816_GT047_STN_64_A2_0276	12.53	1.61
18/08/2016	13:12	DVFK47_A2	51.10900	1.30189	64	6070	DVFK_2GDK70816_GT047_STN_64_A2_0277	12.91	1.33
18/08/2016	13:12	DVFK47_A2	51.10899	1.30199	65	6071	DVFK_2GDK70816_GT047_STN_64_A2_0278	12.77	1.42
18/08/2016	13:12	DVFK47_A2	51.10899	1.30209	65	6072	DVFK_2GDK70816_GT047_STN_64_A2_0279	12.68	1.41
18/08/2016	13:12	DVFK47_A2	51.10896	1.30225	65	6073	DVFK_2GDK70816_GT047_STN_64_A2_0280	13.63	1.47
18/08/2016	13:12	DVFK47_A2	51.10895	1.30234	65	6074	Missed image	13.87	1.35
18/08/2016	13:17	DVFK51_A1	51.10733	1.30336	65	6075	DVFK_2GDK70816_GT051_STN_65_A1_0281	19.85	0.95
18/08/2016	13:17	DVFK51_A1	51.10731	1.30318	65	6076	DVFK_2GDK70816_GT051_STN_65_A1_0282	20.01	0.85
18/08/2016	13:18	DVFK51_A1	51.10732	1.30306	65	6077	DVFK_2GDK70816_GT051_STN_65_A1_0283	19.5	0.71
18/08/2016	13:18	DVFK51_A1	51.10731	1.30292	65	6078	DVFK_2GDK70816_GT051_STN_65_A1_0284	19.51	0.71
18/08/2016	13:19	DVFK51_A1	51.10735	1.30268	65	6079	DVFK_2GDK70816_GT051_STN_65_A1_0285	18.95	0.93
18/08/2016	13:19	DVFK51_A1	51.10737	1.30263	65	6080	Missed image	18.77	1.04
18/08/2016	13:29	DVFK51_A2	51.10735	1.30145	66	6081	DVFK_2GDK70816_GT051_STN_66_A2_0286	17.49	1.82
18/08/2016	13:29	DVFK51_A2	51.10737	1.30161	66	6082	DVFK_2GDK70816_GT051_STN_66_A2_0287	17.86	1.52
18/08/2016	13:29	DVFK51_A2	51.10738	1.30170	66	6083	DVFK_2GDK70816_GT051_STN_66_A2_0288	17.44	1.34
18/08/2016	13:30	DVFK51_A2	51.10739	1.30183	66	6084	DVFK_2GDK70816_GT051_STN_66_A2_0289	17.73	1.17
18/08/2016	13:30	DVFK51_A2	51.10741	1.30190	66	6085	DVFK_2GDK70816_GT051_STN_66_A2_0290	17.51	1.03
18/08/2016	13:30	DVFK51_A2	51.10743	1.30199	66	6086	DVFK_2GDK70816_GT051_STN_66_A2_0291	17.41	0.89
18/08/2016	13:30	DVFK51_A2	51.10746	1.30211	66	6087	DVFK_2GDK70816_GT051_STN_66_A2_0292	17.38	1.14
18/08/2016	13:31	DVFK51_A2	51.10759	1.30246	66	6088	DVFK_2GDK70816_GT051_STN_66_A2_0293	17.64	1.03
18/08/2016	13:31	DVFK51_A2	51.10762	1.30251	66	6089	DVFK_2GDK70816_GT051_STN_66_A2_0294	17.63	1.09

Date	Time	Station Code	WGS84	WGS84	STN number	Hpro fix no.	Still label	Water depth (m)	SOG (knots)
18/08/2016	13:32	DVFK51_A2	51.10767	1.30261	66	6090	DVFK_2GDK70816_GT051_STN_66_A2_0295	17.77	1.06
18/08/2016	13:32	DVFK51_A2	51.10769	1.30263	66	6091	DVFK_2GDK70816_GT051_STN_66_A2_0296	17.64	0.73
18/08/2016	13:32	DVFK51_A2	51.10773	1.30272	66	6092	DVFK_2GDK70816_GT051_STN_66_A2_0297	17.65	0.73
18/08/2016	13:33	DVFK51_A2	51.10779	1.30286	66	6093	DVFK_2GDK70816_GT051_STN_66_A2_0298	17.59	0.71
18/08/2016	13:33	DVFK51_A2	51.10783	1.30296	66	6094	DVFK_2GDK70816_GT051_STN_66_A2_0299	17.47	0.72
18/08/2016	13:33	DVFK51_A2	51.10786	1.30301	66	6095	Missed image	17.31	0.64

7.8 Grab Survey Metadata

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	Cefas STN Number	Hydropro Fix Number	Water Depth (m)	Sediment depth in grab (cm)	Sediment use
19/08/2016	07:39	DVFK61	51.10749	1.32815	67	5377	15.13	-	Discarded
19/08/2016	07:43	DVFK61	51.10772	1.32816	67	5378	15.25	-	Discarded
19/08/2016	07:46	DVFK61	51.10739	1.32836	67	5379	15.06	-	Discarded
19/08/2016	07:52	DVFK64	51.10784	1.32567	68	5380	15.48	-	Picture taken of stone
19/08/2016	07:55	DVFK64	51.10808	1.32581	68	5381	15.5	-	Discarded
19/08/2016	07:58	DVFK64	51.10763	1.32572	68	5382	15.76	-	Discarded
19/08/2016	08:02	DVFK65	51.10899	1.32606	69	5383	15.02	-	Discarded
19/08/2016	08:06	DVFK65	51.10883	1.32581	69	5384	15.13	-	Discarded
19/08/2016	08:09	DVFK65	51.10847	1.32592	69	5385	15.47	-	Discarded
19/08/2016	08:15	DVFK63	51.11068	1.31498	70	5386	15.68	9.5	Biota
19/08/2016	08:22	DVFK63	51.11066	1.31481	70	5387	16.2	6	PSA
19/08/2016	08:28	DVFK59	51.11131	1.31236	71	5388	9.34	6.5	PSA
19/08/2016	08:56	DVFK59	51.11134	1.31237	71	5389	10.44	6	Biota
19/08/2016	09:01	DVFK60	51.11076	1.30959	72	5390	12.64	-	Discarded
19/08/2016	09:03	DVFK60	51.11067	1.30977	72	5391	13.03	-	Discarded
19/08/2016	09:06	DVFK60	51.11063	1.30965	72	5392	12.99	5.5	PSA
19/08/2016	09:11	DVFK60	51.11066	1.30970	72	5393	11.68	5	Biota
19/08/2016	09:16	DVFK62	51.10935	1.31073	73	5394	19.63	-	Discarded
19/08/2016	09:19	DVFK62	51.10942	1.31112	73	5395	19.82	2	Discarded
19/08/2016	09:22	DVFK62	51.10944	1.31109	73	5396	20.07	9.5	Biota
19/08/2016	09:27	DVFK62	51.10938	1.31098	73	5397	19.92	5	PSA
19/08/2016	09:32	DVFK31	51.11103	1.30517	74	5398	9.6	6	Biota
19/08/2016	09:35	DVFK31	51.11103	1.30531	74	5399	9.57	6	PSA

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	Cefas STN Number	Hydropro Fix Number	Water Depth (m)	Sediment depth in grab (cm)	Sediment use
19/08/2016	09:39	DVFK47	51.10891	1.30130	75	5400	11.56	-	Some biota taken
19/08/2016	09:48	DVFK4	51.10738	1.30156	76	5401	17.22	-	Discarded
19/08/2016	09:51	DVFK4	51.10728	1.30160	76	5402	17.78	-	Discarded
19/08/2016	09:53	DVFK4	51.10743	1.30131	76	5403	17.34	9	Biota
19/08/2016	09:59	DVFK4	51.10751	1.30142	76	5404	17.42	-	Discarded
19/08/2016	10:01	DVFK4	51.10741	1.30155	76	5405	17.6	3	Discarded
19/08/2016	10:04	DVFK4	51.10745	1.30152	76	5406	17.73	7	PSA
19/08/2016	10:08	DVFK24	51.10750	1.30126	77	5407	17.75	9	PSA
19/08/2016	10:14	DVFK24	51.10310	1.29851	77	5408	29.51	-	Discarded
19/08/2016	10:17	DVFK24	51.10311	1.29852	77	5409	29.82	-	Discarded
19/08/2016	10:23	DVFK24	51.10307	1.29846	77	5410	29.89	-	Discarded
19/08/2016	10:26	DVFK24	51.10299	1.29836	77	5411	29.7	-	Discarded
19/08/2016	10:29	DVFK24	51.10286	1.29856	77	5412	29.65	-	Discarded
19/08/2016	10:32	DVFK24	51.10288	1.29859	77	5413	29.88	-	Discarded
19/08/2016	10:38	DVFK16	51.09830	1.28925	78	5414	33.27	-	Discarded
19/08/2016	10:42	DVFK16	51.09847	1.28909	78	5415	33	-	Discarded
19/08/2016	10:45	DVFK16	51.09834	1.28890	78	5416	33.28	-	Discarded
19/08/2016	10:49	DVFK16	51.09846	1.28899	78	5417	33.22	-	Discarded
19/08/2016	10:58	DVFK22	51.09393	1.28984	79	5418	34.28	5	PSA
19/08/2016	11:04	DVFK22	51.09375	1.28985	79	5419	32.65	-	Discarded
19/08/2016	11:07	DVFK22	51.09368	1.28977	79	5420	32.24	-	Discarded
19/08/2016	11:12	DVFK22	51.09380	1.28971	79	5421	32.8	5.5	Biota
19/08/2016	11:18	DVFK3	51.09599	1.29497	80	5422	35.46	6	Biota
19/08/2016	11:23	DVFK3	51.09594	1.29499	80	5423	35.64	4	PSA
19/08/2016	11:31	DVFK23	51.10066	1.30531	81	5424	31.75	11	Biota

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	Cefas STN Number	Hydropro Fix Number	Water Depth (m)	Sediment depth in grab (cm)	Sediment use
19/08/2016	11:36	DVFK23	51.10076	1.30536	81	5425	31.76	14	PSA
19/08/2016	11:42	DVFK6	51.10265	1.31567	82	5426	28	10	Biota
19/08/2016	11:46	DVFK6	51.10268	1.31552	82	5427	27.2	-	Discarded
19/08/2016	11:50	DVFK6	51.10268	1.31542	82	5428	27.68	-	Discarded
19/08/2016	11:54	DVFK6	51.10259	1.31540	82	5429	27.32	-	Discarded
19/08/2016	11:58	DVFK6	51.10271	1.31548	82	5430	27.49	11	PSA
19/08/2016	12:09	DVFK21	51.10510	1.29172	83	5431	18.95	3	Discarded
19/08/2016	12:12	DVFK21	51.10487	1.29176	83	5432	19.77	5	PSA
19/08/2016	12:18	DVFK21	51.10492	1.29158	83	5433	19.05	8	Biota
23/08/2016	07:52	DVFK77	51.06897	1.16243	84	5434	12.26	7	PSA
23/08/2016	07:58	DVFK77	51.06895	1.16241	84	5435	12.34	8	Biota
23/08/2016	08:07	DVFK76	51.06858	1.18144	85	5437	23.92	5	PSA
23/08/2016	08:13	DVFK76	51.06856	1.18178	85	5438	24.49	6.5	Biota
23/08/2016	08:19	DVFK70	51.06786	1.19011	86	5439	28.04	-	Discarded
23/08/2016	08:22	DVFK70	51.06801	1.19018	86	5440	28.55	7	Biota
23/08/2016	08:27	DVFK70	51.06795	1.19006	86	5441	28.24	8.5	PSA
23/08/2016	08:33	DVFK68	51.07360	1.19143	87	5442	13.09	7	Biota
23/08/2016	08:37	DVFK68	51.07364	1.19151	87	5443	12.82	-	Discarded
23/08/2016	08:39	DVFK68	51.07356	1.19158	87	5444	13.34	5.5	PSA
23/08/2016	08:46	DVFK71	51.06752	1.20530	88	5445	22.67	-	Discarded
23/08/2016	08:49	DVFK71	51.06766	1.20545	88	5446	22.75	4.5	PSA
23/08/2016	08:54	DVFK71	51.06758	1.20532	88	5447	22.74	-	Discarded
23/08/2016	08:58	DVFK71	51.06768	1.20538	88	5449	22.71	5	Biota
23/08/2016	09:03	DVFK69	51.06952	1.20600	89	5450	24.77	-	Discarded
23/08/2016	09:07	DVFK69	51.06949	1.20605	89	5451	24.71	-	Discarded

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	Cefas STN Number	Hydropro Fix Number	Water Depth (m)	Sediment depth in grab (cm)	Sediment use
23/08/2016	09:09	DVFK69	51.06958	1.20597	89	5452	24.66	5	Biota
23/08/2016	09:13	DVFK69	51.06948	1.20594	89	5453	24.65	4.5	PSA
23/08/2016	09:23	DVFK75	51.07021	1.22077	90	5454	25.01	6	PSA
23/08/2016	09:28	DVFK75	51.07038	1.22107	90	5455	25.01	8	Biota
23/08/2016	09:34	DVFK74	51.07225	1.21487	91	5456	26.24	7.5	PSA
23/08/2016	09:39	DVFK74	51.07241	1.21501	91	5457	26.22	7.5	Biota
23/08/2016	09:45	DVFK67	51.07784	1.20570	92	5458	13.41	8.5	Discarded
23/08/2016	09:50	DVFK67	51.07792	1.20572	92	5459	13.33	7.5	Biota
23/08/2016	09:57	DVFK67	51.07786	1.20574	92	5460	13.16	9	PSA
23/08/2016	10:02	DVFK66	51.07952	1.20421	93	5461	8.12	6	PSA
23/08/2016	10:07	DVFK66	51.07950	1.20420	93	5462	8.33	-	Misfire
23/08/2016	10:08	DVFK66	51.07950	1.20421	93	5463	8.29	5.5	Biota
23/08/2016	10:17	DVFK27	51.08718	1.21346	94	5464	4.91	5.5	PSA
23/08/2016	10:22	DVFK27	51.08719	1.21354	94	5465	4.95	6	Biota
23/08/2016	10:28	DVFK26	51.08848	1.21365	95	5466	4.48	3	Discarded
23/08/2016	10:30	DVFK26	51.08847	1.21367	95	5467	4.54	7	PSA
23/08/2016	10:34	DVFK26	51.08844	1.21369	95	5468	4.64	7	Biota
23/08/2016	10:38	DVFK25	51.08905	1.21605	96	5469	5.28	7	PSA
23/08/2016	10:42	DVFK25	51.08912	1.21609	96	5470	5.48	5.5	Biota
23/08/2016	10:48	DVFK7	51.08719	1.22180	97	5471	11.46	5	PSA
23/08/2016	10:52	DVFK7	51.08730	1.22194	97	5472	11.47	7	Biota
23/08/2016	10:58	DVFK30	51.09115	1.21672	98	5473	5.54	4	Discarded
23/08/2016	11:00	DVFK30	51.09123	1.21703	98	5474	5.35	6	PSA and Contaminants
23/08/2016	11:05	DVFK30	51.09127	1.21703	98	5475	5.38	5	Contaminants
23/08/2016	11:11	DVFK30	51.09128	1.21699	98	5476	5.67	5.5	Biota

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	Cefas STN Number	Hydropro Fix Number	Water Depth (m)	Sediment depth in grab (cm)	Sediment use
23/08/2016	11:14	DVFK30	51.09132	1.21684	98	5477	5.7	5	Contaminants
23/08/2016	11:19	DVFK30	51.09128	1.21700	98	5478	5.89	5	Contaminants
23/08/2016	11:24	DVFK30	51.09118	1.21665	98	5479	5.94	-	salinity
23/08/2016	11:30	DVFK8	51.09485	1.22350	99	5480	6.38	9	Biota
23/08/2016	11:33	DVFK8	51.09478	1.22372	99	5481	6.47	6	PSA
23/08/2016	11:39	DVFK29	51.09157	1.22827	100	5482	10.34	6	Biota
23/08/2016	11:43	DVFK29	51.09156	1.22825	100	5483	10.46	9	PSA and Contaminants
23/08/2016	11:49	DVFK29	51.09163	1.22831	100	5484	10.87	9	Contaminants
23/08/2016	11:54	DVFK29	51.09156	1.22823	100	5485	10.9	-	salinity
23/08/2016	11:55	DVFK29	51.09153	1.22817	100	5486	11.01	-	Contaminants
23/08/2016	12:40	DVFK28	51.09419	1.23007	101	5487	11.24	8	Biota
23/08/2016	12:44	DVFK28	51.09428	1.23012	101	5488	11.4	13	PSA
23/08/2016	12:51	DVFK2	51.09064	1.23568	102	5489	18.18	7	Biota
23/08/2016	12:55	DVFK2	51.09071	1.23564	102	5490	17.99	7.5	PSA
23/08/2016	12:59	DVFK32	51.09301	1.23612	103	5491	15.28	-	Discarded
23/08/2016	13:01	DVFK32	51.09298	1.23624	103	5492	15.28	8	Biota
23/08/2016	13:05	DVFK32	51.09305	1.23609	103	5493	15.47	8.5	PSA
23/08/2016	13:09	DVFK20	51.09496	1.23882	104	5494	14.25	5.5	PSA and Contaminants
23/08/2016	13:15	DVFK20	51.09487	1.23884	104	5495	14.54	6	Biota
23/08/2016	13:19	DVFK20	51.09488	1.23879	104	5496	14.5	6	Contaminants
23/08/2016	13:23	DVFK20	51.09498	1.23865	104	5497	14.65	5.5	Contaminants
23/08/2016	13:24	DVFK20	51.09502	1.23941	104	5498	15.07	-	salinity
23/08/2016	13:30	DVFK73	51.08932	1.24768	105	5499	30.31	-	Discarded
23/08/2016	13:33	DVFK73	51.08913	1.24755	105	5500	29.73	-	Discarded
23/08/2016	13:36	DVFK73	51.08923	1.24737	105	5501	28.81	-	Discarded

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	Cefas STN Number	Hydropro Fix Number	Water Depth (m)	Sediment depth in grab (cm)	Sediment use
23/08/2016	13:41	DVFK5	51.09409	1.25166	106	5502	22.4	7	Biota
23/08/2016	13:45	DVFK5	51.09412	1.25157	106	5503	22.37	8	PSA
23/08/2016	13:51	DVFK72	51.09092	1.26086	107	5504	33.25	7	PSA
23/08/2016	13:57	DVFK72	51.09095	1.26082	107	5505	33.37	-	Discarded
23/08/2016	13:59	DVFK72	51.09095	1.26084	107	5506	33.33	7	Biota
23/08/2016	14:04	DVFK10	51.09174	1.26562	108	5507	33.94	-	Discarded
23/08/2016	14:07	DVFK10	51.09155	1.26552	108	5508	34.05	-	Discarded
23/08/2016	14:10	DVFK10	51.09155	1.26557	108	5509	33.93	8.5	Biota
23/08/2016	14:14	DVFK10	51.09156	1.26556	108	5510	34	7	PSA
23/08/2016	14:20	DVFK11	51.08839	1.27524	109	5511	33.34	5.5	PSA
23/08/2016	14:27	DVFK11	51.08815	1.27529	109	5512	33.13	6	Biota
23/08/2016	14:35	DVFK18	51.08014	1.27419	110	5514	33.58	-	Discarded
23/08/2016	14:39	DVFK18	51.08015	1.27448	110	5515	33.04	-	Discarded
23/08/2016	14:42	DVFK18	51.08035	1.27443	110	5516	31.42	8.5	PSA
23/08/2016	14:48	DVFK18	51.08027	1.27448	110	5517	32.06	-	Discarded
23/08/2016	14:53	DVFK18	51.08015	1.27430	110	5518	32.89	-	Discarded
23/08/2016	14:55	DVFK18	51.08016	1.27433	110	5519	32.73	-	Discarded
23/08/2016	15:01	DVFK17	51.07984	1.28441	111	5520	27.39	4	PSA
23/08/2016	15:07	DVFK17	51.07990	1.28445	111	5521	26.92	-	Discarded
23/08/2016	15:09	DVFK17	51.07993	1.28446	111	5522	26.89	-	Discarded
23/08/2016	15:11	DVFK17	51.07995	1.28437	111	5523	27.06	-	Discarded
23/08/2016	15:18	DVFK9	51.08907	1.28226	112	5524	36.81	7	PSA
23/08/2016	15:24	DVFK9	51.08900	1.28234	112	5525	36.93	-	Discarded
23/08/2016	15:27	DVFK9	51.08894	1.28201	112	5526	36.66	6.5	Biota
23/08/2016	15:34	DVFK19	51.09602	1.27658	113	5527	31.54	-	Discarded

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	Cefas STN Number	Hydropro Fix Number	Water Depth (m)	Sediment depth in grab (cm)	Sediment use
23/08/2016	15:37	DVFK19	51.09591	1.27672	113	5528	31.39	-	Discarded
23/08/2016	15:39	DVFK19	51.09600	1.27645	113	5529	31.4	-	Discarded
23/08/2016	15:45	DVFK56	51.09821	1.26858	114	5530	20.25	-	Discarded
23/08/2016	15:47	DVFK56	51.09814	1.26871	114	5531	19.88	7	PSA
23/08/2016	15:53	DVFK56	51.09800	1.26856	114	5532	18.96	-	Discarded
23/08/2016	15:55	DVFK56	51.09811	1.26860	114	5533	20.03	-	Discarded
23/08/2016	15:59	DVFK57	51.09828	1.26812	115	5534	20.83	-	Discarded
23/08/2016	16:01	DVFK57	51.09818	1.26812	115	5535	20.59	5	PSA
23/08/2016	16:08	DVFK57	51.09828	1.26820	115	5537	20.68	7	Biota
23/08/2016	16:12	DVFK58	51.09833	1.26883	116	5538	20.33	-	Discarded
23/08/2016	16:14	DVFK58	51.09836	1.26885	116	5539	20.11	-	Discarded
23/08/2016	16:17	DVFK58	51.09845	1.26881	116	5540	20.59	-	Discarded
25/08/2016	09:57	DVFK14	51.08982	1.31031	165	5721	26.25	-	Discarded
25/08/2016	10:00	DVFK14	51.09004	1.31033	165	5722	26.79	-	Discarded
25/08/2016	10:02	DVFK14	51.09005	1.31044	165	5723	26.2	-	Discarded
25/08/2016	10:09	DVFK15	51.08940	1.30550	166	5724	26.41	-	Discarded
25/08/2016	10:11	DVFK15	51.08926	1.30557	166	5725	26.75	3.5	PSA
25/08/2016	10:16	DVFK15	51.08927	1.30547	166	5726	26.79	-	Discarded
25/08/2016	10:19	DVFK15	51.08940	1.30564	166	5727	26.44	-	Discarded
25/08/2016	10:25	DVFK12	51.09118	1.29946	167	5728	19.64	-	Discarded
25/08/2016	10:26	DVFK12	51.09119	1.29939	167	5729	19.41	-	Discarded
25/08/2016	10:28	DVFK12	51.09124	1.29944	167	5730	19.45	9	PSA
25/08/2016	10:32	DVFK12	51.09121	1.29936	167	5731	19.25	-	Discarded
25/08/2016	10:34	DVFK12	51.09114	1.29936	167	5732	19.28	4	Biota
25/08/2016	10:42	DVFK1	51.09869	1.28377	168	5733	26.96	8.5	PSA

Date	Time UTC	Station Code	WGS84 Latitude DD.DDDDD	WGS84 Longitude DD.DDDDD	Cefas STN Number	Hydropro Fix Number	Water Depth (m)	Sediment depth in grab (cm)	Sediment use
25/08/2016	10:47	DVFK1	51.09871	1.28366	168	5734	26.95	5	Contaminants
25/08/2016	10:53	DVFK1	51.09869	1.28369	168	5735	27.23	6	Contaminants
25/08/2016	10:57	DVFK1	51.09877	1.28373	168	5736	26.8	9	Biota
25/08/2016	11:02	DVFK1	51.09868	1.28375	168	5737	26.66	5	Contaminants
25/08/2016	11:05	DVFK1	51.09867	1.28366	168	5738	26.99	8	Contaminants
25/08/2016	11:12	DVFK13	51.10076	1.27455	169	5739	14.27	5.5	PSA
25/08/2016	11:16	DVFK13	51.10073	1.27441	169	5740	13.74	8	Biota
25/08/2016	11:28	DVFK4_B2	51.10778	1.30050	170	5741	12.05	-	Discarded
25/08/2016	11:32	DVFK4_B2	51.10736	1.30139	170	5742	13.15	6	Contaminants
25/08/2016	11:36	DVFK4_B2	51.10735	1.30143	170	5743	13.2	-	Discarded
25/08/2016	11:38	DVFK4_B2	51.10730	1.30138	170	5744	13.17	-	Discarded
25/08/2016	11:40	DVFK4_B2	51.10738	1.30144	170	5745	13.47	-	Discarded
25/08/2016	11:41	DVFK4_B2	51.10748	1.30142	170	5746	13.29	-	Misfire
25/08/2016	11:43	DVFK31_B2	51.10748	1.30151	171	5747	13.14	-	Contaminants
25/08/2016	11:47	DVFK31_B2	51.11092	1.30525	171	5748	6.42	-	Contaminants
25/08/2016	11:50	DVFK31_B2	51.11086	1.30527	171	5749	6.78	-	Salinity
25/08/2016	11:57	DVFK31_B2	51.11098	1.30520	171	5751	6.67	-	Contaminants

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