1.1 Survey Methods Summary

The methods employed during baseline survey operations are described in full in the ECA Regional Monitoring Blueprint v0.3 (The ECA & Emu, 2005). A detailed description of the methods employed is provided for each component of the physical and biological monitoring, broken down into component parts of the work (drop down video, grab, 2m trawl, etc).

Changes in methodology from those proposed in the Blueprint v0.3 are noted and reasons for changes given. This information is provided in **Appendix 1**. A summary of the methods employed is provided below.

Physical Process Survey Methods

The physical nature of the seabed was investigated on a regional basis and also at the regional 'type site' Area 473 East. The following techniques were employed.

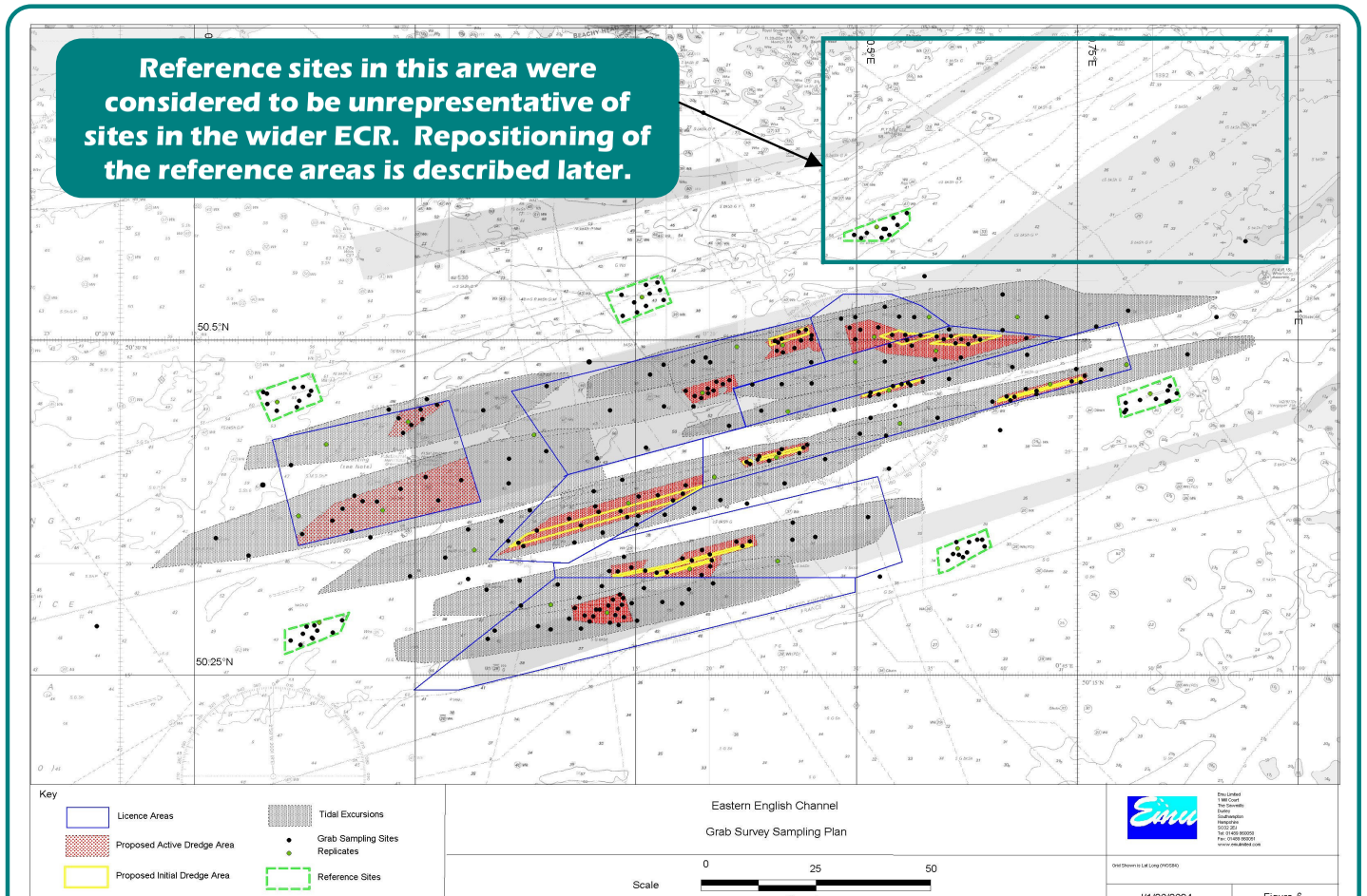
- ***The physical character of the seabed and habitats across the region was investigated during the baseline surveys through capture of drop camera images and acquisition of 0.1m² Hamon grab samples at approximately 375 sites. The Hamon grab samples were subsequently sieved to determine the particle size characteristics of the seabed.***
- ***Within the ECR 'type site', Area 473 East, the physical nature of the seabed was further investigated using drop camera and clamshell grab sampling at 74 sites. A seabed profile camera was deployed at 10 sites to capture images of the sediment/water interface. A towed video sled was also employed to acquire data along transects where impacts due to deposition of fine sediment are predicted.***

The camera images, grab samples and video sled footage will be used to ground truth geophysical survey data, notably sidescan sonar and swath bathymetry, to enable a more thorough description of the seabed within, and immediately surrounding, Area 473 East.

Biological Community Survey Methods

Sampling sites for characterisation of regional biological communities were chosen as per the rationale described in the Blueprint v0.3. The following survey techniques were employed to describe the regional habitats and biological communities:

- ***Biotopes and habitats were investigated in two areas to the southwest of the region through acquisition of high frequency sidescan sonar and seabed video footage.***
- ***Infaunal and epifaunal communities were sampled using a Hamon grab. Prior to grab sampling a drop camera was employed to capture an image of the seabed. The camera and grab were deployed at approximately 375 sites across the region. Additional habitat data was derived from the drop camera images.***
- ***Epifaunal communities were also sampled using a 2m scientific beam trawl. The 2m trawl was deployed at 48 sites.***
- ***Commercially important fish, shellfish species and demersal fish species in general, were sampled using a 4m beam trawl and 'Newhaven' scallop dredge survey gear. The two methods were employed at 48 sites. Invertebrate data from the 4m beam trawls were also used to link the fish populations with benthic epifaunal communities.***



The regional camera and grab sampling array as presented in the Blueprint v0.3. Some modification of the proposed array was required due to the unrepresentative nature of the seabed within some reference sites.

1.2 Field Operations Summary

The following describes the field operations undertaken during baseline monitoring activities in the East Channel Region.

The methods for sampling, including positioning, drop-video and grab deployment, duration of trawls and dredges, etc are described in Appendices referred to in this section.

A description of vessels used and timing/duration of survey operations is included in **Appendices 2** and **3** along with descriptions of gear used for sampling including dimensions, mesh sizes, etc.

All baseline survey operations, both physical and biological, were conducted between August and December 2005. A more detailed description of the operations can be found in related contractors reports (**Appendix 2**) and **Appendix 3** of this report.

Broad-scale physical, and biological, survey operations were undertaken during August and September 2005. Monitoring operations at the regional 'type site' Area 473 East, were undertaken during November and December 2005.

Appendices referred to in this section also provide details of how actual survey operations were modified when compared with those presented in the Blueprint v0.3 along with the reasons for the modification.

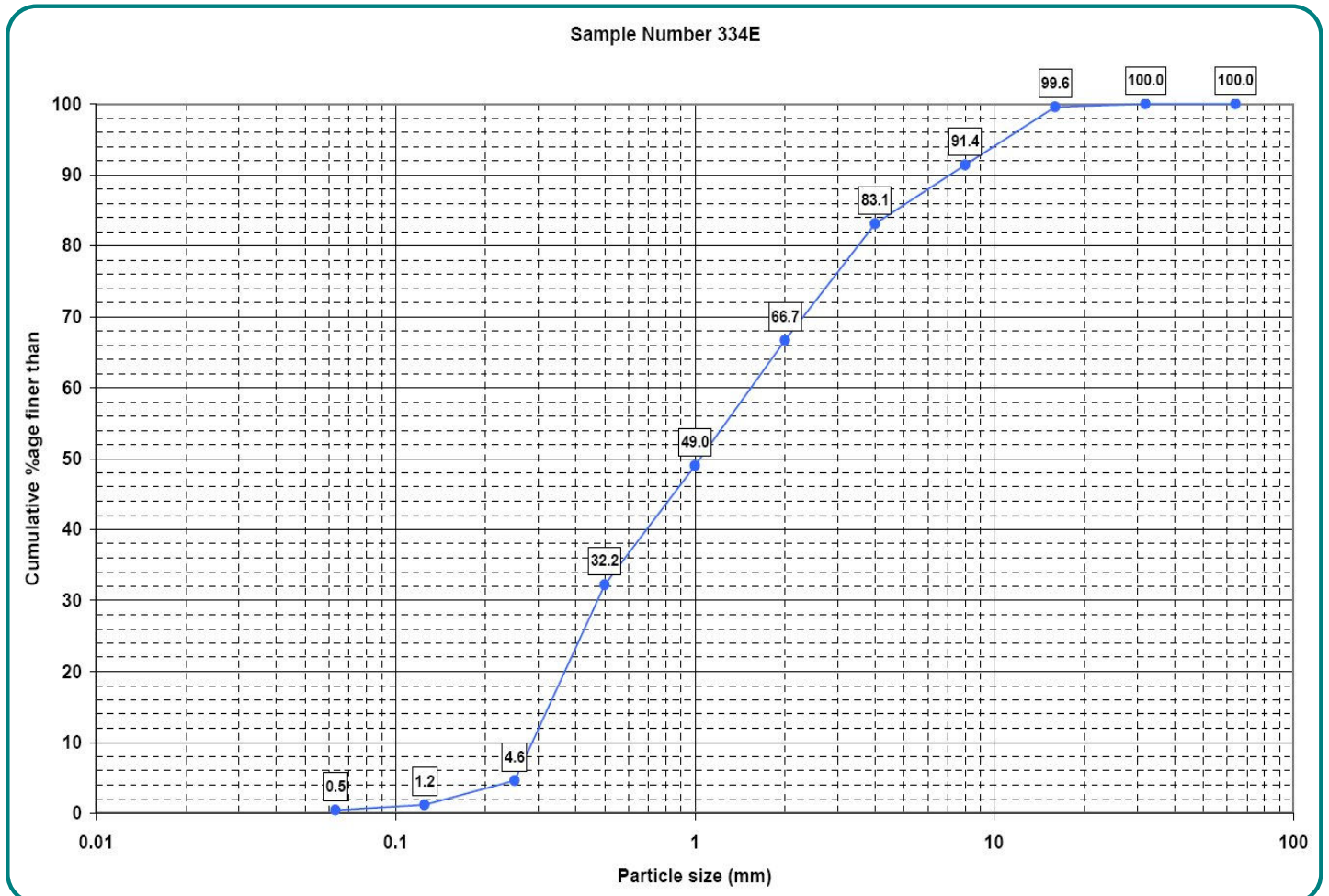
1.3 Aims of the Regional Seabed Sediment Sampling

The aim of regional seabed sampling is to provide photographic and sediment particle size data from numerous sites across the ECR. The sampling programme employed a drop camera and 0.1m² Hamon grab at approximately 375 sites to provide a broad-scale description of the seabed.

The data acquired from subsequent static image and sieve analysis provides baseline data regarding the character of sediment at the stations sampled. Repeat sampling will be undertaken during the life of the monitoring programme and comparative studies undertaken to determine if and how extraction activities have modified the seabed conditions.

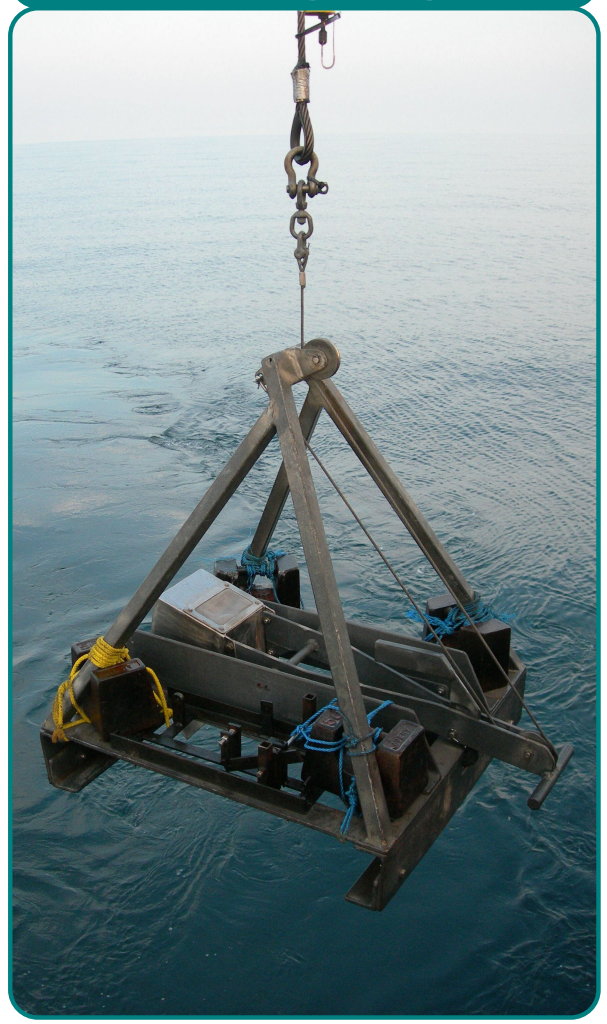
1.4 Regional Hamon Grab Sampling Methodology, Operations & Outputs

A Hamon grab was deployed at all sites across the region as part of the regional biological monitoring. The grab samples were sub-sampled to provide sediment for sieve analysis. Prior to grabbing all sites were investigated using a drop camera to ensure that sensitive habitats were not impacted by grabbing operations. A more detailed description of drop camera and Hamon grab sampling operations is contained within the description of biological monitoring and related Appendices.



Particle size distribution data from the Hamon grab samples will be used to detect changes in sediment composition. The position of sample sites ensures that both primary and secondary impacts are monitored along with reference areas beyond the influence of aggregate extraction.

A 0.1m² Hamon grab was used to acquire samples for both particle size analysis and benthic faunal community analysis



All Hamon grab samples were photographed at the surface prior to processing. Sub-samples of the sediment were taken for particle size and faunal analysis.

Regional Seabed Sediment Sampling Outputs (Appendix 4 unless otherwise stated)

- *Navigation report: UTEC (2005). EECA: Newhaven Benthic Survey Operations. Volume 1: Results. Revision 1. UTEC Reference: 530G, pp11 (Appendix 2).*
- *Survey (Parts 1 and 2) Field Log*
- *Grab log and inventory*
- *Video & stills image log and inventory*
- *PSA samples for further laboratory analysis*
- *Stills images of grab samples once recovered to the deck prior to processing*

Acquisition of seabed images prior to grab sampling prevented damage to sensitive habitats and also provides valuable qualitative information regarding the status of the seabed prior to aggregate extraction.

1.5 Aims of the Physical Monitoring at Area 473 East

The overall aim of the regional physical monitoring surveys at Area 473 East is to:

- ***Test the predictions made in the REA related to changes in dredging derived suspended and seabed sediment distribution and flux in the ECR, using a single regionally representative type site (473 East).***

The seabed sediment survey, the baseline activities for which were undertaken in 2005, has been planned in order to:

- ***Test the REA prediction of sea bed sediment deposition and transport in the ECR (Posford Haskoning, 2003 & Blueprint v0.3, Figure 11, 2005), which will permit a clear detailed understanding of scale and type of sea bed impact arising from deposition of fine sediment liberated by dredging and allow dredging process adjustment if required.***

In addition to the seabed sediment surveys that will be undertaken in Area 473 East, plume and tracer studies will also be carried out. These studies are currently in the planning phase with field operations due to be undertaken in 2007. Progress toward development of the plume and tracer studies is described later in this report.

1.6 Area 473 East Seabed Sediment Survey Methodology, Operations & Outputs

The methodology for the baseline seabed sediment survey was developed in order to provide a description of the seabed within and around Area 473 East.

Prior to the survey available sidescan sonar data (**Figure 2**) were reviewed to determine the seabed character within the survey area. The review showed that the seabed exhibits no significant variation in character, consisting almost entirely of a uniform sandy gravel seabed with isolated patches of coarser sediments. There was no evidence for the presence of sediment bedforms (see Area 473 East sidescan interpretation **Figure 3**).

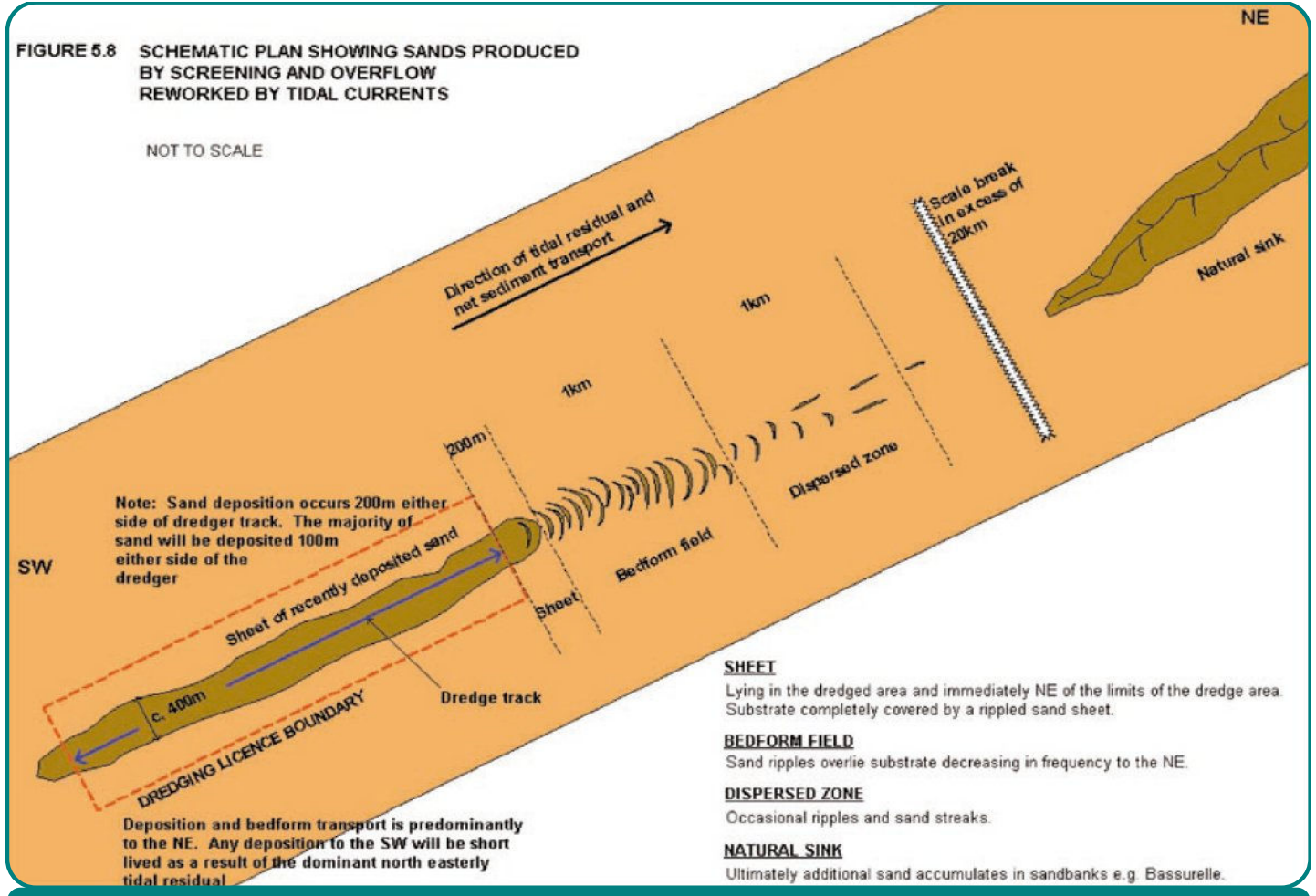
On this basis it was concluded that, due to the generally uniform nature of the seabed in the survey areas, sampling sites would be positioned in order to target areas likely to be influenced by sediment deposition as predicted in the REA model.

The field sampling array was designed to provide qualitative and quantitative data regarding the area of the seabed that will be influenced directly and indirectly by extraction operations.

The baseline seabed sediment survey employed four main survey techniques:

- ***Drop down video still photography.***
- ***Seabed profile image (SPI) photography.***
- ***Videosled transect survey.***
- ***Clamshell grab sampling.***

In line with current JNCC recommendations, the survey was undertaken to ensure that no sensitive seabed habitats/species were impacted by the work. All sites were investigated using the drop camera prior to sediment sampling by clamshell grab. No sensitive habitats were noted during the drop camera survey.



The REA model predicts development of sand deposits immediately surrounding, and to the north east of, active extraction areas. Sampling sites for the 473 East survey were positioned to investigate this prediction.

Survey operations were undertaken from the S/V Kommandor Iona by Utec Services Ltd. Survey operations report is included in **Appendix 3**. The location of sampling sites by gear type are shown in **Figures 4** to **6**.

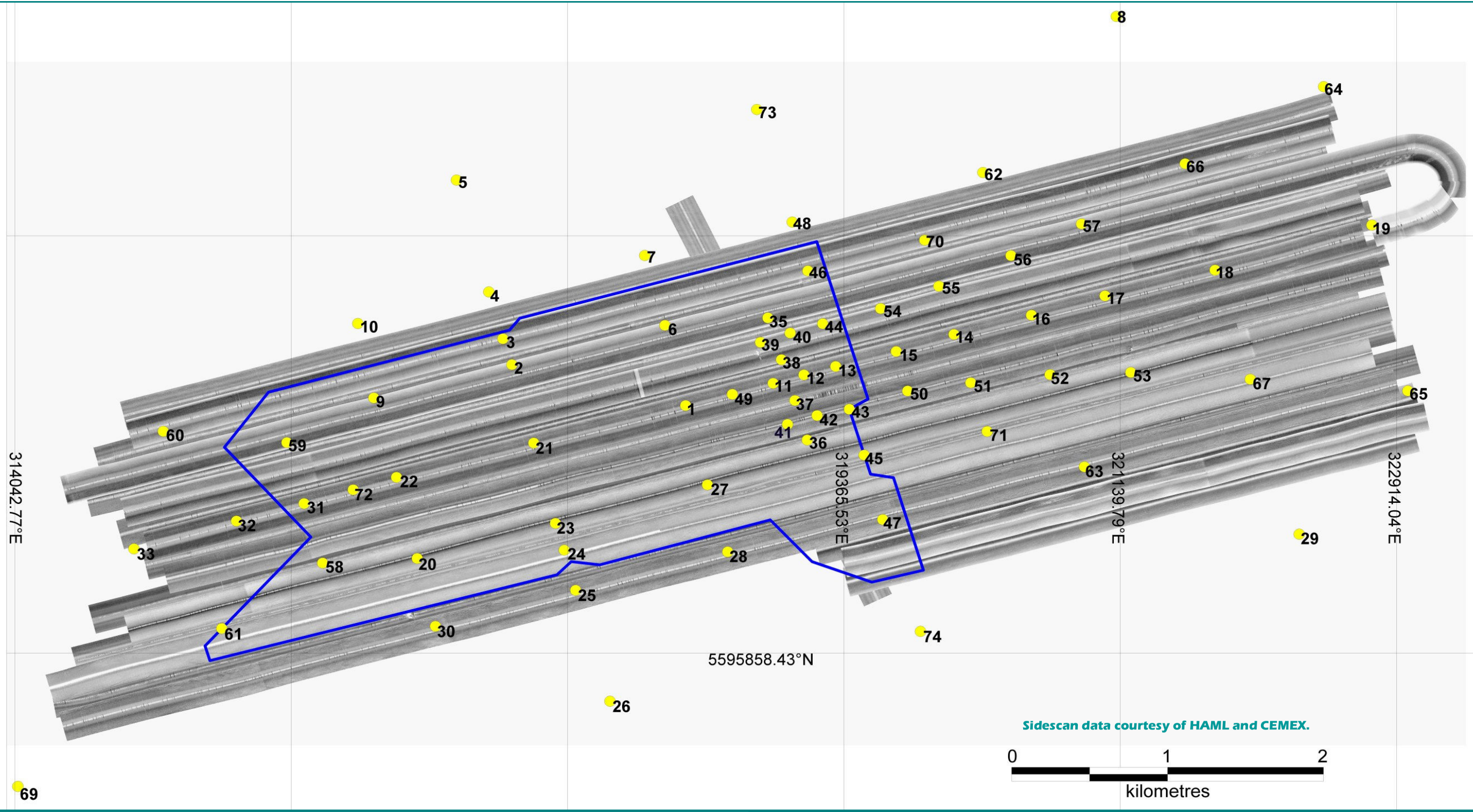
The SPI camera was deployed to begin at the 10 designated sites. SPI images were obtained at all sites. Following completion of the SPI work drop camera operations began.

All sites were photographed prior to grab operations. Once an image of a sampling site was obtained the grab was deployed at the site. The camera was deployed independently of the grab to prevent damage to either piece of equipment. Due to the seabed conditions some difficulty was experienced retaining a suitable sample at some sites. This was generally due to cobbles preventing total closure of the grab jaws. When this occurred, the sample retained was photographed, logged and sub-sampled (where sufficient sediment was retrieved) and the grab redeployed at the site for a further attempt.

This process was repeated up to a maximum of three attempts. Where repeated samples were taken at a site the best, in terms of largest volume of sediment retained and least level of sample disturbance, was kept for analysis.

Grab samples were photographed prior to sub-sampling and a qualitative description of the sediment noted. Evident fauna were identified where possible. Where the quality of the sample permitted, a short core sample (15-30cm) was taken from the grab sample and a larger bulk sample (7-12 litres) was taken and stored in formalin.

Grab samples were photographed again following sub-sampling to show the vertical profile of the sediment retained. Following completion of the camera and grab operations, the videosled was deployed and footage recorded along the prescribed transects.

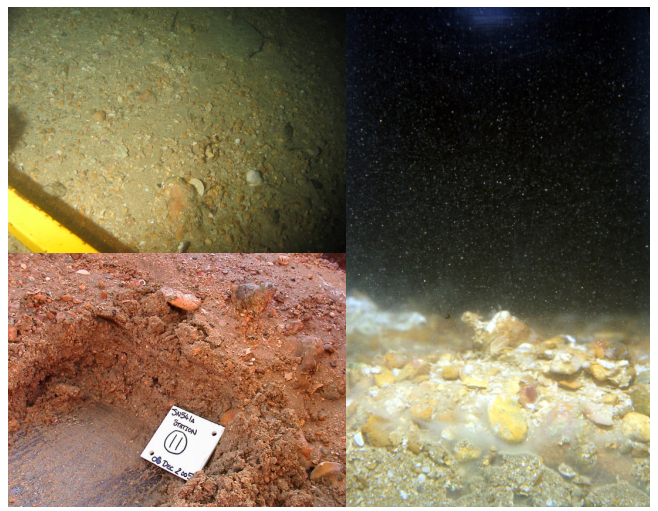


Sidescan data courtesy of HAML and CEMEX.

Photographs were taken of the seabed surface and the sediment samples retrieved at each site, when suitable samples were acquired.

Seabed profile images were also recorded at the ten high density sites in the centre of the survey array (Sites 11, 12, 35, 36, 37, 38, 39, 40, 41 & 42).

Seabed, clamshell grab and seabed profile images from Site 11 show comparable seabed sediment.



High frequency sidescan sonar data from Area 473 East was mosaiced and reviewed prior to the seabed sediment survey. This ensured that sampling sites were located with regard for natural sediment variation and to avoid any sensitive areas. The review of sidescan data did not highlight any sensitive habitats and showed there was no distinct sediment environments, other than mixed sand and gravel, that warranted specific investigation.

Area 473 Baseline Seabed Sediment Survey Outputs (Appendix 5 unless otherwise stated)

- *Navigation report: UTEC (2005). EECA: 473 Survey Operations. UTEC Reference: 541A, pp11. (Appendix 2)*
- *SPI Survey Report: Aquafact (2005). (Included in the above report – Appendix 2)*
- *Stills Images of the Seabed*
- *Video Transect Data*
- *Stills Images of Grab Samples Recovered to the Deck Prior to Processing*
- *Handcores for Logging and Particle Size Analysis*

1.7 Objectives of Regional Biological Monitoring Surveys

The objectives of the regional biological monitoring surveys, as described in the Blueprint v0.3, are as follows:

- *To provide a regional view of the pre-dredge status of seabed habitats and biota in the Eastern English Channel in the vicinity of the proposed dredging.*
- *To provide a regional reference point against which predictions concerning localisation of impacts due to dredging may be tested.*
- *To provide a coherent programme of monitoring within which the predictions concerning impacts due to dredging may be tested.*
- *Ensure results of monitoring in individual licence areas are compatible across the regional area.*
- *To develop thresholds that may be applied to enable limitation of impacts.*
- *To place the conservation importance of the area into a regional and national context through the development of a Habitat and Biodiversity Action Plan.*

1.8 Drop Down Video Survey Methodology, Operations and Outputs

Aim

Provide baseline information on the epibenthic communities across the ECR survey area and contribute to the ground-truthing of acoustic survey interpretations.

Requirement

Carry out an acoustic survey in two regions and along three transects followed by drop down video survey at predetermined locations, with the following objectives:

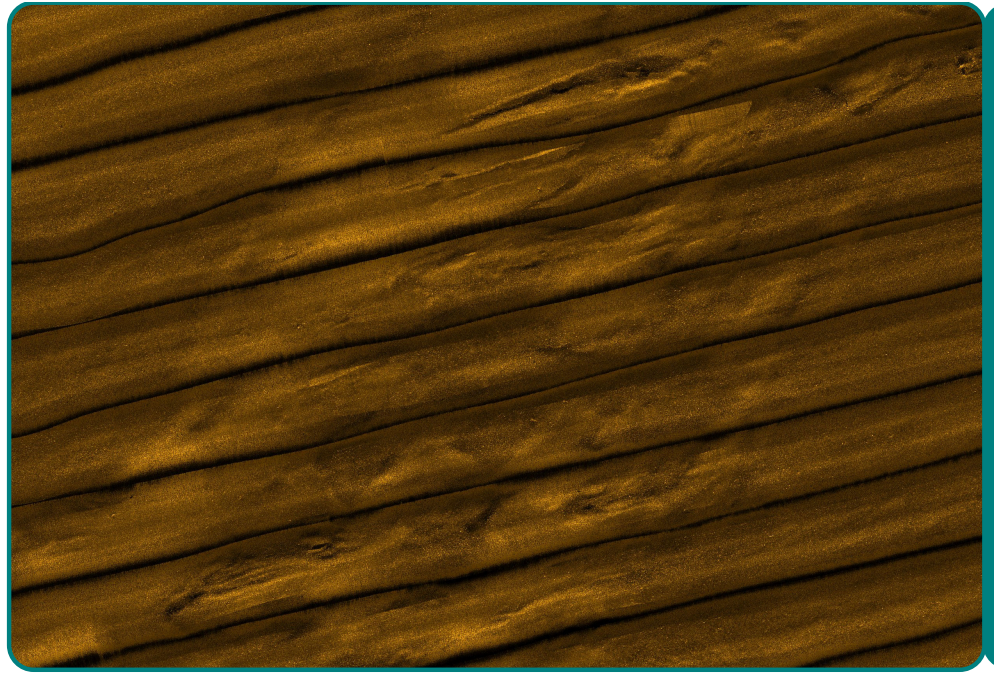
- *Define the character of the seabed from acoustically acquired data.*
- *Confirm the description of acoustically acquired habitat and biotope information.*
- *Provide standalone data at sites where grab sampling is not currently possible.*

Prior to video survey operations, the regional sidescan sonar survey was undertaken by Utec Services Ltd from the Kommandor Iona. The three regional transects were completed and two study areas to the south west of Area 461 were surveyed to provide full coverage, high resolution, digital sidescan sonar data. Data from the two survey blocks in the south west of the region was mosaiced and reviewed prior to video operations to identify areas of interest that were subsequently targeted by the video survey.

Where acoustically acquired data were collected a drop down video was employed to determine the nature of seabed. The equipment was used to identify habitat changes over transects of seabed in the order of 1km long. Along the 1km transect, 5 sampling locations were identified in relation to evident habitat types.

At each sampling location, 5 separate static replicates were recorded, with drift coverage at intervening areas over a total length of approximately 50m. Coverage of swath bathymetry and sidescan sonar data are presented in **Figures 7** and **8**. Whilst not plotted, sidescan data are available over the regional transects. This data will be incorporated into the regional data set at a later date.

Where grab sampling was not possible, a series of 5 separate static replicates was recorded at each site over a drift coverage of 100m.



Drop down video was employed to provide ground-truthing of sidescan sonar data, as shown on the left, acquired as part of the regional biotope and habitat survey. Two areas were surveyed in this way – one in an area likely to impacted and one that is beyond the potential impact of extraction activities.

Video and photographic records of the seabed were used to groundtruth acoustic data. The images were used to describe the character of the seabed by noting the proportion of sand, gravel, cobbles and shell and also evident epifauna.

The regional video surveys conducted onboard the survey catamaran Xplorer (17.11.05, 18.11.05 and 10.12.05). **Appendix 3** details key personnel involved and their role. Detailed descriptions of the methods employed in the field are documented in full within **Appendix 1** and Annex 3 of the Blueprint v0.3. Key points from these are summarised with details of any deviations (including rationale behind these) from those proposed within the Blueprint v0.3.

Acoustic (Bathymetry and Sidescan Sonar) Survey Outputs

- *Navigation data*
- *Swath bathymetry (xyz)*
- *Sidescan sonar data (xtf)*

Drop Down Video Survey Outputs (Appendix 6 unless otherwise stated)

- *Video survey field log, video positions and related information*
- *Video and stills image log and inventory*
- *Video recording sheet*
- *Video and stills image data analysis results*

An inventory of all video footage and stills images is presented in **Appendix 6**.

1.9 Benthic Infaunal and Epifaunal Community Hamon Grab Survey, Methodology, Operations and Outputs

Aim

Provide baseline information on the benthic communities across the ECR survey area.

Requirement

Carry out a combined grab sampling and drop down video survey at 375 predetermined locations with the following objectives:

- ***Gain and retain a real-time view of the seabed prior to sampling with grab to avoid damaging environmentally sensitive habitats.***
- ***Obtain either single or replicate seabed samples using a 0.1m² Hamon grab.***
- ***Obtain oblique digital stills images covering an area of at least 0.1m² (min. of 4 Mega Pixel resolution) to enable review of seabed character.***

Benthic infaunal and epifaunal communities were investigated by employing drop camera and grab sampling methods. The sampling operations were planned to target sites that would be both directly (Primary Impact Zones) and indirectly (Secondary Impact Zones) influenced by extraction operations. Within the PIZ, sites determined as immediate future active dredge zones (ADZ) were included. In addition, reference areas were sampled to provide comparative sites that would allow natural variations in faunal communities, similar too those evident in the PIZ and SIZ areas, to be investigated.

This section includes a summary of the survey methods employed during the baseline grabbing and drop down video survey carried out in August and September 2005 to achieve related ecological monitoring objectives of the Blueprint v0.3.

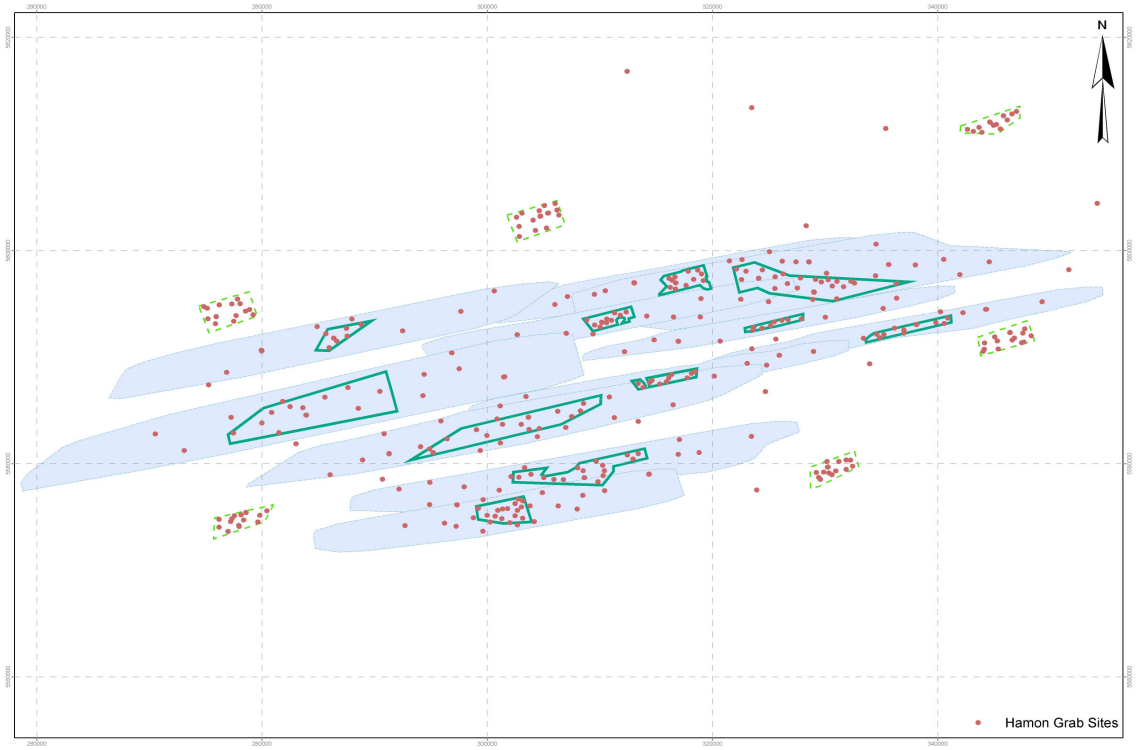
Part 1 of the benthic grabbing and drop down video survey was carried out over a 17 day period (07.08.05 to 23.08.05) on board the vessel Kommandor Iona from Newhaven. Part 2 of the survey was carried out over a 1 day period (11.09.05) on board the Arie Dirk, also operating from Newhaven.

Appendix 3 details key personnel involved and their role. Full details of all operational activities associated with Part 1 of the grabbing and drop down video survey are listed in the Newhaven Benthic Survey Operations Report, Vol 1, Rev 1 which is presented in **Appendix 2** of this report for reference. It includes:

- ***Site positions and details for all deployments.***
- ***Daily progress reports.***
- ***Full details on horizontal positioning QC.***

Full details associated with Part 2 of the survey are listed as a field log in **Appendix 4**. Positions of drop camera and grab sites are shown in **Figures 9** and **10**. Detailed descriptions of the methods employed in the field are documented in the Blueprint v0.3.

Key points from these are summarised in **Appendix 1** together with details of any deviations that occurred during sampling (including rationale behind these) from those proposed within the Blueprint v0.3.



The regional grab survey acquired samples from 375 sites across the region from sites within the proposed dredging areas, sites within areas of secondary impact and reference sites

Drop cameras provide a effective method of determining the character of the seabed before grabbing equipment is deployed. This enables best use of the grabbing equipment, by avoidance of unsuitable seabed, and prevents damage to sensitive habitats and species.

Regional Drop Camera & Hamon Grab Outputs (Appendix 4 unless otherwise stated)

- *Navigation report: UTEC (2005). EECA: Newhaven Benthic Survey Operations. Volume 1: Results. Revision 1. UTEC Reference: 530G, pp11. (Appendix 2)*
- *Survey (Parts 1 and 2) Field Log*
- *Grab log and inventory*
- *Video & stills image log and inventory*
- *Macrobenthic samples for further laboratory analysis*
- *Video and stills image data for further analysis*
- *Stills images of grab samples once recovered to the deck prior to processing*

An example inventory of grab samples collected at each site during both parts 1 and 2 of the survey is presented in **Appendix 4**. Additional notes on the quality of grab samples obtained (in particular where samples <5L were accepted) are listed in **Appendix 4**. **Appendix 4** presents an example inventory for initial video footage and stills images and **Appendix 4** contains all seabed images and images of grab samples once recovered to the deck prior to processing respectively.

1.10 Epibenthic Community Survey Methodology, Operations and Outputs

Aim

Provide baseline information on the epibenthic communities determined from 2m beam trawl surveys across the ECR survey area.

Requirement

Carry out a beam trawling survey at 48 predetermined locations, with the following objectives:

- ***Obtain real-time seabed footage using a drop down video system prior to trawling to avoid damaging environmentally sensitive habitats.***
- ***Undertake beam trawling at all sites using a 2m scientific beam trawl fitted with a 5mm inner mesh (cod end).***

This section includes a summary of the survey operations and field methods used during the baseline 2m scientific beam trawl survey (carried out in August 2005) to achieve relevant objectives of the Blueprint v0.3.

The 2m scientific beam trawl survey was conducted over an 11 day period (08.08.05 to 18.08.05) onboard the 18m survey vessel Arie Dirk operating out of Newhaven or Eastbourne Marina on a daily basis.

All 2m trawl locations are plotted on **Figure 11**.

Detailed descriptions of the methods employed in the field are documented in full within **Appendix 1**, and Annex 3 of the Blueprint v0.3. Key points are summarised together with details of any deviations (including rationale behind these) from those proposed within the Blueprint v0.3.

Appendix 7 present a summary of survey events for the full survey period. Full details of all operational activities associated with the 2m beam trawling are listed in the form of daily progress reports within **Appendix 7**.

The 2m beam trawl samples species that live attached to, or upon, the seabed surface.

2m beam trawl samples were acquired using the Arie Dirk seen here steaming to the survey area from Sovereign Harbour, Eastbourne.

2m Beam Trawl Survey Outputs (Appendix 7 unless otherwise stated)

- *2m Beam Trawl Survey Field Log*
- *2m Beam Trawl Positions and Related Information*
- *Stills Images of 2m Trawl Samples once Recovered to the Deck Prior to Processing*
- *Video Image Log and Inventory from 2m Beam Trawls*
- *2m Beam Trawl Results – Samples Details*
- *2m Beam Trawl Results – Fish and Shellfish Measurements*
- *2m Beam Trawl Results – Full Species Lists*

A full inventory of beam trawl samples collected is presented in **Appendix 7**. **Appendix 7** presents the photographs taken of the beam trawl samples prior to processing, with sub-sample photographs taken where appropriate.

1.11 Scallop Dredge Survey Methodology, Operations and Outputs

Aim

Provide baseline information for commercially important epifaunal species, specifically scallop species, against which an assessment of the effects of dredging activity can be measured across the ECR survey area.

Requirement

Carry out a scallop dredge survey at 48 predetermined locations, with the following objectives:

- ***Sample the commercially important scallop species (Aequipecten opercularis and Pecten maximus).***
- ***Sample other commercially important fauna and associated epibenthic communities.***

In order to comply with the Blueprint v0.3, the occurrence and distribution of ***Aequipecten opercularis*** **(Queen Scallop),** ***Pecten maximus*** **(King Scallop),** ***Cancer pagurus*** **(Brown crab),** ***Buccinum undatum*** **(Common whelk) and** ***Maja squinado*** **(Spider crab)** have been determined.

This section includes a summary of the survey operations and field methods used during the baseline scallop dredging survey carried out in September 2005.

The scallop dredging survey was carried out over a six day period (09.09.05 – 10.09.05 and 18.09.05 to 21.09.05) on board the vessel MV Arie Dirk working out of Eastbourne Marina. Positions of dredge sites are shown in **Figure 11**.

Appendix 8 presents details of events for the full survey period for the scallop dredging. Site positions and related metadata for all deployments are presented within **Appendix 8**.

Detailed descriptions of the methods employed in the field are documented in full within **Appendix 1** and Annex 3 of the Blueprint v0.3. Key points from these are summarised, with details of any deviations (including rationale behind these) from those proposed within the Blueprint v0.3, in **Appendix 1**.

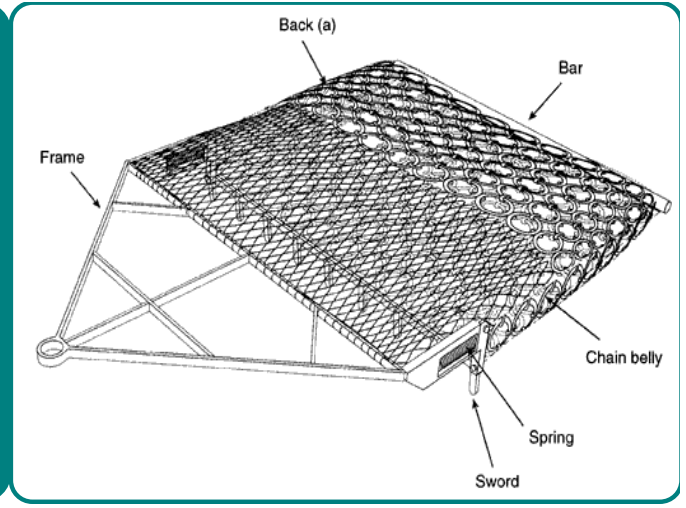
Scallop Dredge Survey Outputs (Appendix 8 unless otherwise stated)

- ***Scallop Dredge Survey Field Log***
- ***Scallop Dredge Positions and Related Information***
- ***Stills Images of Scallop Dredge Samples once Recovered to the Deck Prior to Processing***
- ***Scallop Dredge Results – Samples Details***
- ***Scallop Dredge Results – Fish Measurements***
- ***Scallop Dredge Results – Shellfish Measurements***
- ***Scallop Dredge Results – Full Species Lists***

A full inventory of scallop dredge samples collected at each site is presented in **Appendix 8**, and images of all scallop dredge samples once recovered to the deck prior to processing are presented **Appendix 8**. Field measurements for fish and all shellfish are presented in **Appendix 8**.

Scallop dredges employ a toothed bar (teeth are know as swords) to comb the seabed sediment and remove scallop which are retained in chain mesh 'bags'.

Image from - A Fishing Industry Guide to Offshore Operations, Scottish Executive Rural Affairs Department, 2001.



Scallop dredge samples were taken from 48 sites across the ECR. A 'Newhaven' dredge was employed during the sampling.

1.12 4m Beam Trawl Survey Methodology, Operations and Outputs

Aim

Provide baseline information for the commercially important species listed, against which an assessment of the effects of dredging activity can be measured across the ECR survey area.

Investigate the relationships between the demersal fish populations and epibenthic communities.

Use certain relatively long lived demersal species, to determine changes within the population structure, which in turn may be related to dredging activity.

Requirement

Carry out a 4m commercial beam trawling survey at 48 predetermined locations with the following objective:

- ***Sample demersal fish species and associated epibenthic communities.***

This section includes a summary of the survey operations and field methods used during the baseline 4m beam trawling survey carried out in August 2005 to achieve relevant ecological objectives of the Blueprint v0.3.

The 4m beam trawling survey was carried out from the MFV Sara Lena operating from Shoreham over an 8 day period (23.08.05 – 30.08.05). Positions of dredge sites are shown in **Figure 11**.

Appendix 3 details key personnel involved in the survey and their role. **Appendix 9** presents details of events for the full survey period for the 4m beam trawling. Site positions and related metadata for all deployments are presented within **Appendix 9**.

Detailed descriptions of the methods employed in the field are documented in full within **Appendix 1**, and Annex 3 of the Blueprint v0.3.

Key points from these are summarised together with details of any deviations (including rationale behind these) from those proposed within the Blueprint v0.3.

4m Beam Trawl Survey Outputs (Appendix 9 unless otherwise stated)

- ***4m Trawl Survey Field Log***
- ***4m Trawl Positions and Related Information***
- ***Stills Images of Trawl Samples once Recovered to the Deck Prior to Processing***
- ***4m Trawl Results - Samples Details***
- ***4m Trawl Results – Fish Measurements***
- ***4m Trawl Results – Shellfish Measurements***
- ***4m Trawl Results – Full Species Lists***

A full inventory of 4m beam trawl samples collected at each site is presented in **Appendix 9**, and images of all 4m trawl samples once recovered to the deck prior to processing are presented **Appendix 9**. Field measurements for fish and all shellfish are presented in **Appendix 9**.

A 4m beam trawl was deployed at the same 48 sites as the scallop dredge gear. The trawl is designed to sample demersal (bottom dwelling) fish species and also samples shellfish species.

4m beam trawl samples were taken from 48 sites across the ECR. Cefas beam trawl gear was employed during the sampling.

Report Part 1 – Section 1: Summary

→ The methods, operations and outputs summarised in Part 1 – Section 1 should be viewed in conjunction with the details presented in the Blueprint v0.3 and related Appendices to this report.

→ Physical monitoring concentrated on describing the character of the seabed both across the region and at Area 473 East where detailed physical process monitoring is being undertaken.

→ Activities at Area 473 East included drop-camera, SPI camera, clamshell grab and video transect surveys and sediment sampling for particle size analysis.

→ Biological community monitoring concentrated on describing the habitats, and associated infaunal, epifaunal, fish and shellfish communities, across the region.

→ Acoustic, drop-camera, Hamon grab, 2m beam trawl, scallop dredge and 4m beam trawl surveys were employed to acquire diverse datasets capable of describing the ecological setting of the region.

Notes: