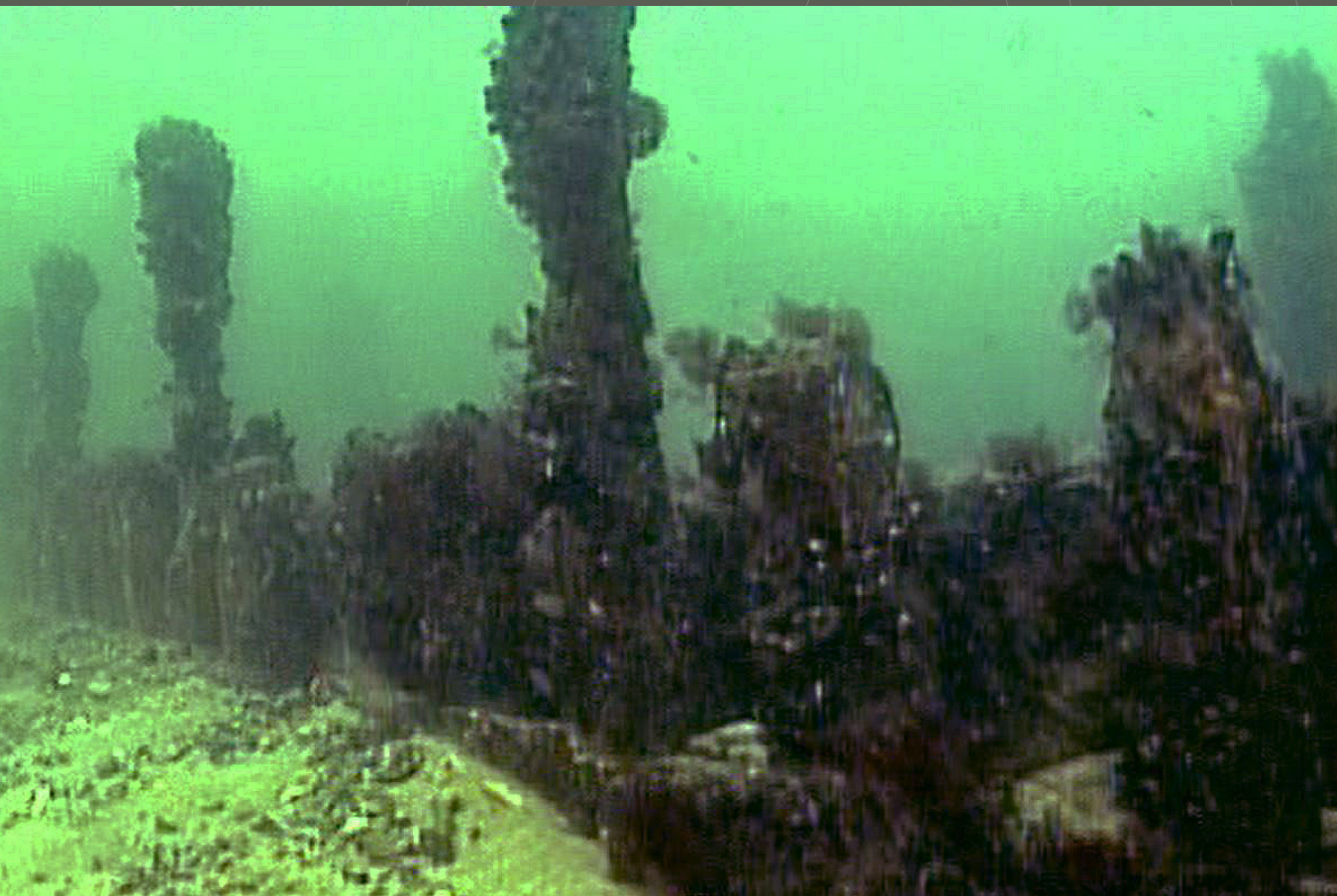


BALTIC PIPE, DANISH BALTIC SECTOR

Screening of geophysical data and target inspections

VIR 2813



Mikkel H. Thomsen



VIKINGESKIBS
MUSEET

BALTIC PIPE, DANISH BALTIC SECTOR
Screening of geophysical data and target inspections

VIR 2813

SLKS 18/00033

Mikkel H. Thomsen

September 2020

Cover illustration: Video image of wreck BP01_VIRSS0071, starboard side. © Rambøll/MIG.

Vikingskibsmuseet, Vindeboder 12, 4000 Roskilde. Telefon: 46 30 02 00, Fax: 46 30 02 01,
email: museum@vikingskibsmuseet.dk www.vikingskibsmuseet.dk

VIR 2813
BALTIC PIPE
401751-141
SLKS 18/00033

Screening of geophysical data and target inspections for the proposed Baltic Pipe gas pipeline, Danish Baltic sector

Contents

Abstract	1
Dansk resumé	1
Introduction	2
Project data	2
Topography, terrain and subsoil	2
Coordinate system	2
Methodology	2
Results	4
Future work	6
Literature	7

Appendices:

- Appendix 1: Target list
- Appendix 2: Video inspection manual
- Appendix 3: Maps

Abstract

The Viking Ship Museum has screened geophysical and ROV video data for the Danish sector of the proposed Baltic Pipe gas pipeline across the Baltic Sea. A total of 237 objects have been reviewed as potential cultural history objects, 104 of which were subjected to visual inspection by ROV. This video footage was screened by the Viking Ship Museum, resulting in 137 confirmed or potential cultural history objects, for which individual exclusion zones have been proposed. The Danish Agency for Culture and Palaces has later approved these zones and the manner in which the lay corridor is to bypass them. Additionally, a paleo-terrain interpreted by Rambøll as the most accurate representation of the Mesolithic terrain surface has been analysed and likely 'hotspots' for Mesolithic settlements identified.

Dansk resumé

Vikingskibsmuseet har udført en marinarkæologisk screening af geofysiske og ROV-video data for den danske sektor af den planlagte Baltic Pipe gasrørledning over Østersøen. Totalt 237 objekter har været under overvejelse som potentielle kulturhistoriske objekter, heraf blev 104 visuelt inspiceret med ROV. Vikingskibsmuseet har screenet disse videooptagelser, hvilket har resulteret i 137 bekræftede eller formodede kulturhistoriske objekter, for hvilke der er foreslået friholdelseszoner. Slots- og Kulturstyrelsen har senere godkendt disse zoner og måden, hvorpå rørledningskorridoren skal passere dem. Desuden er et palæo-terræn, af Rambøll tolket som den bedste repræsentation af terrænoverfladen i Mesolitikum, blevet analyseret, og sandsynlige 'hotspots' for bosættelse i Ældre Stenalder identificeret.

Introduction

Energinet (DK) and Gaz-System (PL) are preparing to build a natural gas pipeline connecting the existing Europipe II pipeline in the North Sea to Poland via Denmark and crossing Swedish EEZ. The section crossing the Baltic Sea will be owned and operated by Gaz-System, who is represented in Denmark by Rambøll A/S.

The Viking Ship Museum (VIR) has been tasked to perform archaeological screening of geophysical data and inspection of potential underwater cultural heritage objects in the Danish sector of the Baltic Sea. Additionally, the Viking Ship Museum has acted as consultant to Gaz-System regarding potential underwater cultural heritage objects in Polish waters. The Swedish sector is processed by Bohusläns Museum (BM). The present report covers the Danish sectors off the islands of Zealand (Sjælland) and Bornholm.

Project data

The desk-based assessments were completed at the Viking Ship Museum in Roskilde, Denmark, by maritime archaeologist Mikkel H. Thomsen.

The project archive is kept at the Viking Ship Museum under file no. 2813. Should an archaeological object become subjected to further study, it will be assigned an individual file number, under which archival material as well as potential artefact collections will be kept.

Topography, terrain and subsoil

The majority of the route lies in relatively deep waters. Only at the landfalls on the Danish island of Zealand (Sjælland) and on the Polish coast, as well as the crossing of the shallow Rønne Banke west of the Danish island of Bornholm, does the pipeline come into contact with a paleo-terrain that has been habitable land since the last Ice Age. In the deeper basins, the surface geology is largely soft mud or silt, whereas in shallower sections, sand, glacial till, and possibly even chalk outcrops are dominating. The proposed pipeline follows and crosses what throughout history has been some of the busiest shipping routes of the world, meaning that a high number of maritime cultural heritage objects are to be expected.

Coordinate system

In the present report and the associated digital files archived at VIR, geographic coordinates are listed in UTM Zone 33 North, WGS 84. Elevations/water depths to MSL.

Methodology

The archaeological screening was performed on side scan sonar data delivered to VIR as turnkey SonarWiz projects.

Initially, potential underwater cultural heritage objects were picked in the side scan sonar data, where appropriate cross-checked in multibeam sonar data, and assigned a proposed first generation exclusion zone in the form of a circle centred on the sonar anomaly and with a radius reflecting the size and nature of the object (200, 50, or occasionally 100 m). The targets were also correlated to the surveyor's target ID where applicable.

First generation zones conflicting with the proposed lay corridor were then subjected to more detailed sonar study and the same group of objects - as well as a number of so-called *seabed clearance targets*,

initially picked for engineering purposes rather than archaeological interest - were subjected to visual inspection using a video-equipped ROV. Based on this new information, a number of exclusion zones could be lifted and for the remainder, an exclusion zone based on the actual perimeter of the object as observed in the sonar and video data (and thus usually smaller than the first generation zone) could be designed (specified in the column *2nd generation exclusion zone* in Appendix 1).

Finally, the resulting exclusion zones were presented to the Danish Agency for Culture and Palaces (Slots- og Kulturstyrelsen, SLKS) for approval.

The visual target inspections have been undertaken in a series of short-notice weather-dependent campaigns, making it difficult to ensure archaeological supervision of the work on board. Instead, a video inspection manual for the ROV-pilot and online/offline data processors was developed, successfully allowing the collection of data without the presence of an on-board archaeologist and the successive delivery of video data to VIR for desktop screening. The manual is attached as Appendix 2.

Table 1: Abbreviations.

Term:	English:	Danish:
BM	Bohusläns Museum (SE)	
DVR 90		Dansk Vertikal Reference 1990
EEZ	Exclusive Economic Zone	Eksklusiv økonomisk zone
GIS	Geographical information system	Geografisk informationssystem
ROV	Remotely operated vehicle	Fjernstyret undervandsfartøj
RSL	Relative sea-level (curve)	Relativ havspejlskurve
SLKS	Agency for Culture and Palaces	Slots- og Kulturstyrelsen
UCH	Underwater cultural heritage	Undersøisk kulturarv
UTM	Universal transverse Mercator	
UXO	Un-exploded ordnance	Ueksploderet ammunition
VIR	Viking Ship Museum, Roskilde	Vikingskibsmuseet i Roskilde
WGS 84	World geodetic system 1984	

In addition to the screening for object lost at sea, the data were screened for areas potentially holding settlement remains from historical periods where the area was dry, habitable land. This process entails several stages, of which the first is to identify and, if possible, date the geological units identified in the sub-bottom profiler and borehole data, leading to the creation of a digital terrain model of the best-guess terrain surface of the historical period of interest; in this case the Mesolithic (c. 9.000-3.900 BC). Next, it is necessary to quantify the relative sea-level rise for the location to recreate the paleo-coastline of the period(s) of interest. Finally, this paleo-landscape should be analyzed and preferred habitation sites identified, whereupon an assessment of the degree to which the proposed project can damage potential archaeological remains can begin. The first two stages were undertaken by geologist Stig B. Marstal, Rambøll (2019) supplemented by a renewed assessment utilizing the full swath of available survey lines by Joanna Przychodzen and Niels Richardt, Rambøll (2020); the latter is the subject of this report.

Results

A total of 200 sonar anomalies have been picked by VIR in Danish waters (two hereof by BM in sonar files crossing the DK/SE border). The targets have been successively delivered as a series of point-object GIS files with the naming convention:

BP[section no.]_VIRcontacts[version no. where applicable].shp

68 of these have been visually inspected using ROV-mounted video together with 37 so-called *seabed clearance targets* with the aim of lifting or redesigning the first-generation exclusion zones (note that these figures include duplicate targets).

It has proven difficult to identify, and indeed date, many of the objects due to visibility constraints and marine growth. Many objects are thus classed as *inconclusive* regarding their status as potential underwater cultural heritage. It is quite possible that a human inspection dive can clarify this in many cases. However, for the present project, it has proven possible to design pipelay corridor and exclusion zones respectively, so that confliction is avoided.

Upon the visual inspection, only objects with a confirmed or inconclusive status as underwater cultural heritage retained their exclusion zone, which, where appropriate, was redesigned to reflect the actual observed perimeter of the object on the seabed. This resulted in 136 exclusion zones to be respected during construction, operation and decommissioning of the pipeline (see Appendix 3.1 and 3.2).

The exclusion zones have been successively delivered as a series of polygon GIS files with the naming convention:

BP[section no.]_VIRfeatures[version no. where applicable]_ply_buffered

Of these, only eight are conflicting with the lay corridor:

BP01_VIRSSS0044, BP01_VIRSSS0063, BP09_L11, BP09_VIRSSS0005, BP09_VIRSSS0006, BP09_VIRSSS0072, BP22_O33, BP22_VIRSSS0005

For these objects a so-called lay-avoid procedure has been agreed, in which the lay vessel pulls to the opposite side of the lay corridor (a one-sided reduction of lay tolerance) when passing the object; leaving the intended safe distance to the object's exclusion zone ($\frac{1}{2}$ lay corridor width, except in the case of BP09_VIRSSS0005 where a slightly shorter distance has been accepted). Additionally, where appropriate, temporarily excavated material is to be deposited only on the side of the pipeline facing away from the object. These mitigation measures have been approved by Torben Malm, SLKS, at a meeting at Rambøll Head Office 2019-03-29.

Archaeological sonar data screening is no guarantee that an area is clear of archaeological objects. After finalizing the archaeological screening, an object of potential historical value was indeed discovered during the client's UXO survey: the magnetic anomaly *M-B06-0002-NHP* (see Figure 1). Upon closer examination, including careful excavation for visual inspection, this proved to be a man-made object. The footprint of the magnetic anomaly in its entirety suggests that it could represent an unknown, buried wreck, in which case it is most likely protected by the Museum Act. The detailed magnetic mapping of the object and its immediate surroundings meant that, rather than necessitating

further investigation, it was deemed archaeologically safe, and technically feasible, to establish an exclusion zone with a radius of 100 m and reroute the pipeline around this to the north. This is implemented in the current route rev. E (see Appendix 3.1). These measures were approved by the SLKS in an email of 05-08-2019. This chance find brings the total sum up to:

- 69 (partly) inspected objects;
- 137 exclusion zones, of which
- 9 are conflicting with the installation corridor.

All nine have been resolved either by rerouting (M-B06-0002-NHP) or through implementation of the aforementioned lay-avoid procedure.

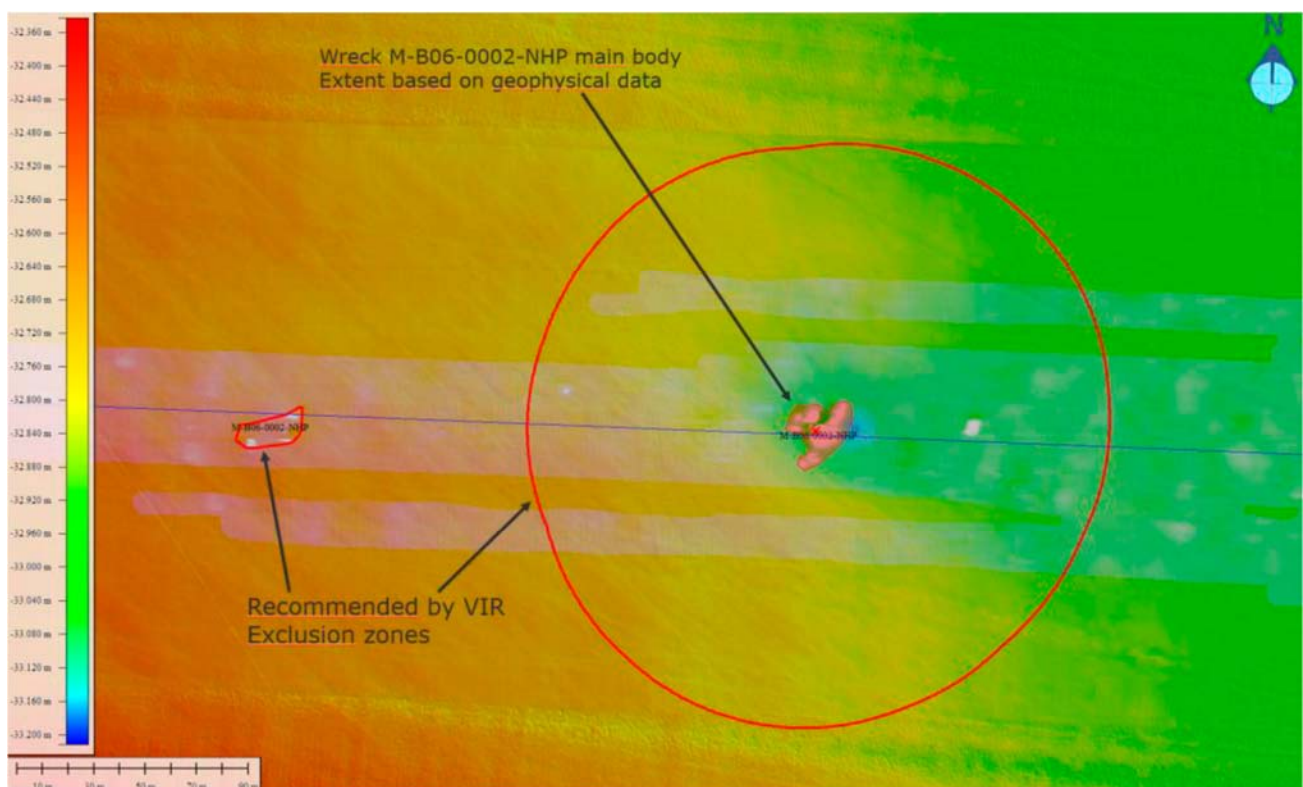


Figure 1: Magnetic anomaly M-B06-0002-NHP with exclusion zone on bathymetric map. Illustration: Rambøll.

The Baltic Sea has a complicated geological history, and the reconstruction of a reliable relative sea level curve (RSL) is difficult. This is compounded by the vast expanse occupied by the pipeline project, necessitating the creation of several RSL curves, each representative of a suitable segment of the pipeline. For the present project, Rambøll has created five such RSL curves: *Faxe Bugt*, *South of Sweden*, *Rønne Banke*, *North of Poland*, and *Polish Coast*. The difference between these reflect the difference in isostatic uplift, which in turn is a function of the distance from the mass centre of the last glaciation. For the Danish sections, the RSL curves *Faxe Bugt* and *Rønne Banke* were used. They both indicate that 15m below MSL is the lowest possible location of a terrain surface habitable during the period since the last ice age. However, at *Rønne Banke* drowned forest has been observed as deep as 19m below MSL; not only in the present project where fallen trees were observed in the video record of several SSS target inspections (see Appendix 1, pp. 20-23), but also by fishermen's chance finds in the

past (Fischer, A. pers. comm; <http://www.kulturarv.dk/fundogfortidsminder/>). Add to this a general uncertainty factor in the creation of the geological model and the RSL curves. Therefore the identification of potential Stone Age ‘hotspots’ presented in this report was performed to -17m for Faxe Bugt and -20m for Rønne Banke. In the renewed assessment, this was confirmed by radiocarbon dating of terrestrial sediments extracted from the Baltic Pipe project vibrocores (Przychodzen & Richardt 2020; 8-10).

Where possible, identification of ‘hotspots’ relies on analyzing the topography of the paleo-landscape, based on a well-proven assumption that people in the Mesolithic settled on the coasts (including freshwater lakes and rivers) and preferred a topography favoring a marine subsistence (Fischer 1993, 2007). The paleo-terrain produced by Rambøll is based on an integrated re-interpretation of the vibrocore results and the seismic profiles. The resulting paleo-terrain model is based on all 7-15 lines constituting the survey corridor (the width of which varies along its length). The resulting terrain model is thus regarded as a reliable representation of the Mesolithic terrain. All such potential coastlines above -17/-20m respectively *and* within the construction (trenching) depth of the pipeline were analyzed, resulting in the identification of three Mesolithic ‘hotspots’ in the Danish nearshore sector, defined in the GIS file:

NewMesoAOIs.tab

The hotspots are defined as line segments (Σ length: 181.5 m) for which Mesolithic habitation under threat from disturbance cannot be ruled out (see Appendix 3.3).

Future work

For the present route design (Revision E), as defined in the GIS file:

1100029714_RevE_Line.shp

it has been determined that pipelay can proceed (using the agreed lay-avoid procedure where appropriate) without further archaeological mitigation measures with regards to maritime cultural heritage objects lying exposed on the seabed.

The three Mesolithic habitation ‘hotspots’ - line segments where the pipeline comes into contact with the coastal zone of a relevant paleo-terrain - should be surveyed archaeologically whereupon necessary mitigation measures, most likely removal by excavation, can be initiated where appropriate.

It should be noted that activities other than actual pipelay (anchoring, wire sweep, trenching, rock dumping and other seabed intervention works) exceeding the standard lay corridor is not covered by this report. However, it may be undertaken following the same principles, that is: *within* the archaeologically screened area, *respecting* the exclusion zones.

Should cultural heritage objects be encountered during construction of the pipeline in spite of the efforts to identify and avoid them, the contractor is obliged to stop work on site and notify the Agency for Culture and Palaces as per the Danish Museum Act § 29h sect. 1.





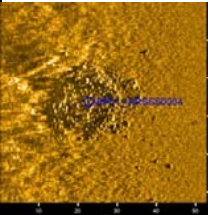
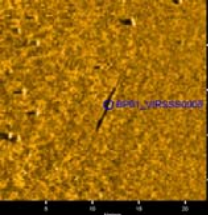
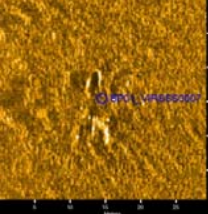
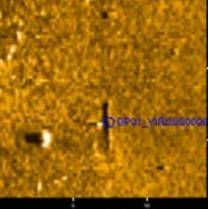
Literature

Fischer, A., 1993: *Stone Age settlements in the Småland Bight. A theory tested by diving.* Miljøministeriet, Skov-og Naturstyrelsen, København.

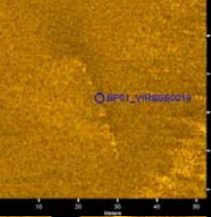
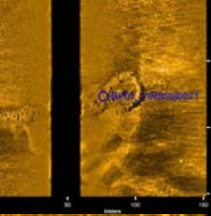
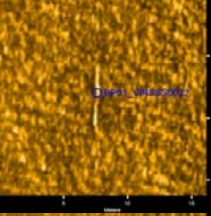
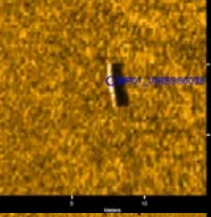

Fischer, A., 2007: Coastal fishing in Stone Age Denmark - evidence from below and above the present sea level and from human bones. In: Milner, N., Craig, O.E. and Bailey, G.N. (eds), *Shell middens in Atlantic Europe.* Oxford, pp 54-69.

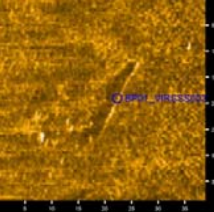
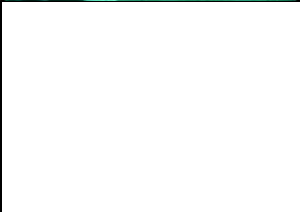
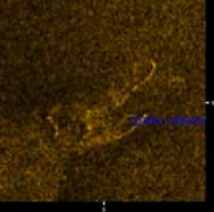

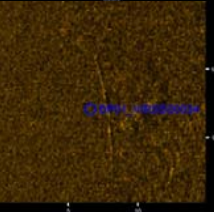

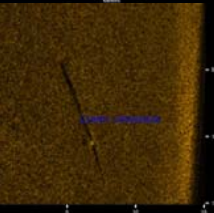

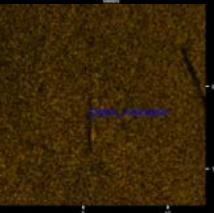

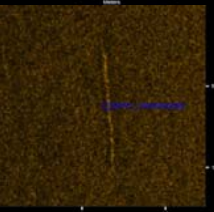
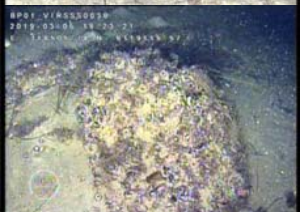
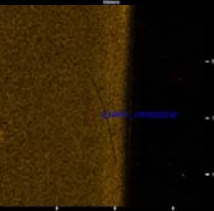

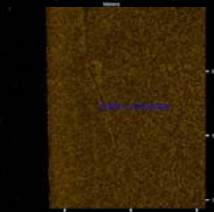
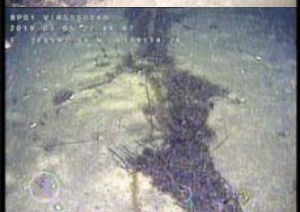
Marstal, S.B. 2019: *Baltic Pipe offshore pipeline – permitting and design. Geoarchaeological desktop study.* (Rambøll client report for Gaz-System S.A.).

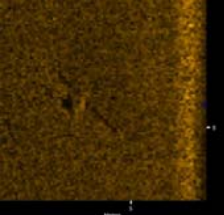

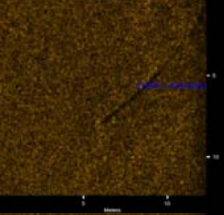

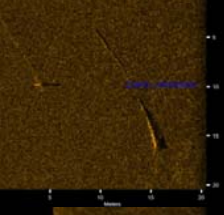
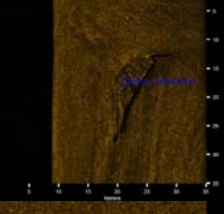
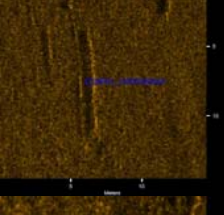
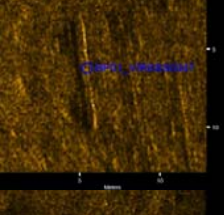

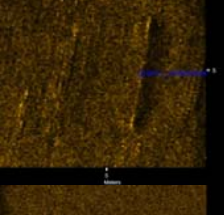
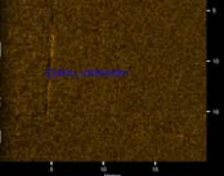
Przychodzen, J. & Richardt, N, 2020: *Baltic Pipe project. Geoarchaeological reconstruction of Stone Age landscape.* (Rambøll client report for Vikingskibsmuseet and Gaz-System S/A).

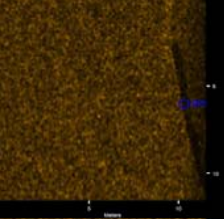
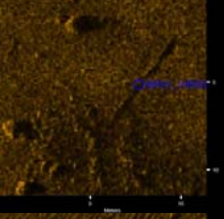
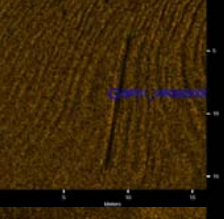
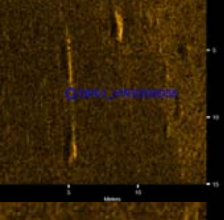
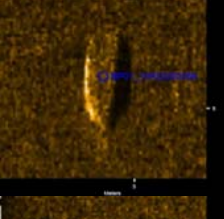

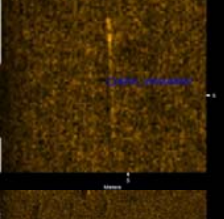
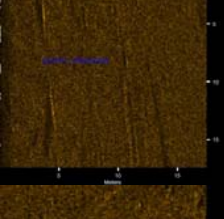

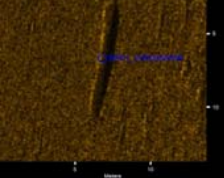
Target ID	Pick history	KP	UTM 33 [m] (WGS-84)		VIR SSS interpretation					Visual		VIR comments (Y = same as first-hand ROV desc.)	UCH Yes/Inconclusive/No	2nd generation exclusion zone Yes/No	Confliction with Route Rev. E Yes/No	
			Easting	Northing	Image	Desc	Uclass1	Tlength	Twidth	Theight	Image					First-hand ROV interpretation and description
BP01_B5657	Seabed clearance target	4,523	321059,57	6118515,29								Boulder, diameter 20-30 cm.	Y	N	N	N
BP01_B5660	Seabed clearance target	4,526	321056,36	6118514,63								Boulder, diameter 20-30 cm.	Y	N	N	N
BP01_L17	Seabed clearance target	4,407	320952,72	6118579,53								Boulder, diameter 30 cm.	Y	N	N	N
BP01_LI07	VIR pick	2,007	318615,92	6119113,41								Linear log, diameter 20 cm, length 14.7 m, orientation W-E. To the north lies a form (fishermen nets, most probably the same which were seen near dive 0040) covered in biology, orientation W-E, its E side ends with the stake (height 80 cm) covered in seabed life forms.	Pres. fishing stake (a section standing); pres. modern	N	N	N
BP01_VIRSS0004	VIR pick		325293,74	6117601,73		Poss. wreck/ballast pile. Linear feature nearby. BP01_S18, 1058	mound	28,91	25,02	0,73				I	Y	N
BP01_VIRSS0005	VIR pick		324925,78	6117670,91		Linear object. BP01_L01	linear	7,98	0,34	0,11				I	Y	N
BP01_VIRSS0007	VIR pick		327431,36	6117097,54		Pres. man-made. Poss. modern. BP01_L05, L06	unknown	11,12	5	0,16				I	Y	N
BP01_VIRSS0008	VIR pick		327668,53	6117011,52		Linear object. BP01_L08	linear	3,53	0,12	0,11				I	Y	N


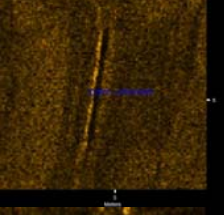

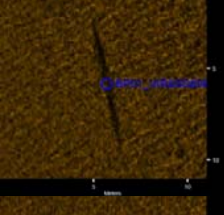
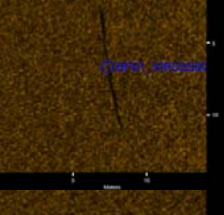
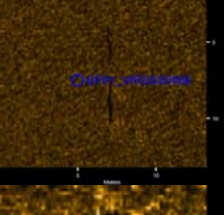
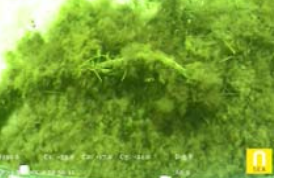
BP01_VIRSS0009	VIR pick		327591,25	6117015,97		Linear object; poss. same as VIRSS0008. BP01_L07	linear	11,85	0,27	0,17				I	Y	N
BP01_VIRSS0010	VIR pick		327753,87	6117093,32		Linear object. BP01_L09	linear	7,87	0,34	0,11				I	Y	N
BP01_VIRSS0011	VIR pick		327790,73	6117071,53		Unknown object. Poss rudder/sternpost. BP01_L10	unknown	7,55	1,49	0,18				I	Y	N
BP01_VIRSS0012	VIR pick		328569,61	6116818,24		Poss. wreck. Debris field w. min. 6 linear objects. BP01_3074, 3076, etc.	debris	29,22	33,42	0,37				I	Y	N
BP01_VIRSS0013	VIR pick		326044,80	6117520,50		Linear object. BP01_2	linear	7,77	0,56	0,1				I	Y	N
BP01_VIRSS0014	VIR pick		325759,59	6117430,64		Rectangular, poss. semi-buried, object, NMH	unknown	15,47	6,92	0,03				I	Y	N
BP01_VIRSS0015	VIR pick		326658,05	6117250,89		Poss. wreck/ballast pile. Linear feature nearby. BP01_1328, 1334, etc.	mound	39,93	15,22	0,2				I	Y	N
BP01_VIRSS0016	VIR pick		325112,54	6117638,39		Oval hole in mound. Poss. dredging pit(s) w. ass. spill dump. [btw.] BP01_957, 952, etc.	unknown	15,94	7,48	0,13				I	N	N

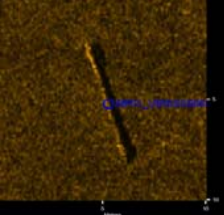
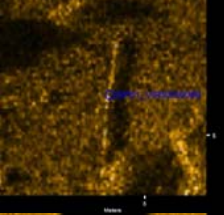
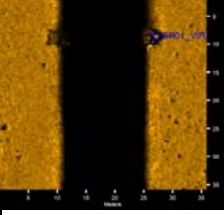




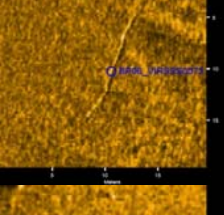
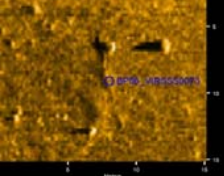
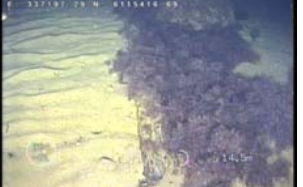
BP01_VIRSS0017	VIR pick		325598,29	6117728,38		Poss. wreck/ballast pile. [within] BP01_S18	mound	32,5	25,12	0,36					I	Y	N
BP01_VIRSS0018	VIR pick		325713,03	6117595,31		Pres. wreck. Debris trail in vicinity. [near] BP01_1277	wreck	30,9	6,76	0,2					I	Y	N
BP01_VIRSS0019	VIR pick		325768,54	6117527,50		Poss. semi-buried object	linear angled	29,16	1,83	0,01					I	Y	N
BP01_VIRSS0021	VIR pick		325944,27	6117700,18		Atypical formation of two circular mounds w. smaller central mound. Trail leading into these. Poss dredging spill dump. BP01_S18	mound	106,68	29,23	1,6					I	Y	N
BP01_VIRSS0022	VIR pick	10,484	326789,12	6117010,79		Linear object	linear	5,04	0,44	0,03		Linear wooden object, diameter 10-15 cm, length 5.5 m, orientation WNW-ESE, partly covered by plants and seabed.	Spar/log/stake		I	Y	N
BP01_VIRSS0025	VIR pick		324902,31	6117567,98		Linear object	linear	3,26	0,33	0,14					I	Y	N
BP01_VIRSS0026	VIR pick	8,155	324538,13	6117555,81		Poss. wreck/ballast pile. Seemingly w. linear features. BP01_362, 393	mound	26,39	16,49	0,83		Field of boulders covered by plants.	Natural boulder field (heterogeneous)		N	N	N
BP01_VIRSS0029	VIR pick	10,746	327012,28	6116810,03		Linear object. BP01_L03	linear	9,8	0,55	0,12		Linear wooden object, diameter 20 cm, length 8.5 m, orientation W-E, covered by plants.	Spar/log/stake		I	Y	N

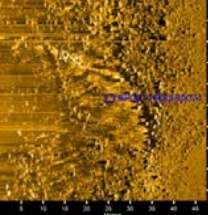
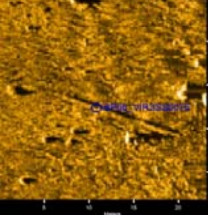
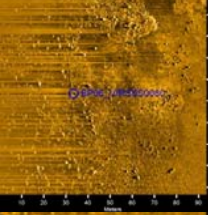
BP01_VIRSS0031	VIR pick		324774,55	6117151,04		Linear object	linear	16,74	0,72	0,29				I	Y	N
BP01_VIRSS0032	VIR pick	6,839	323304,59	6117955,77		Pres. modern line debris	cable	6,39	3,19	0,1		Old long rope, partly covered by plants.	Y	N	N	N
BP01_VIRSS0034	VIR pick	5,267	321785,26	6118364,43		Linear object. BP01_L18	linear angled	8,8	0,22	0,05		Wooden log, diameter 10 cm, length 7 m, orientation W-E, covered by plants.	Pres. fishing stake; pres. modern	N	N	N
BP01_VIRSS0036	VIR pick	1,901	318507,50	6119111,35		Linear object - part of group	linear	9,63	0,29	0,15		Two linear objects; first log with diameter 20 cm, length 4.7 m, orientation W-E; second log with diameter 15 cm; length 11 m orientation W-E. Partly covered by sand. On the northern side of 4.7 m log lies a boulder 40x40 cm.	Pres. fishing stake w. rope; pres. modern	N	N	N
BP01_VIRSS0037	VIR pick	1,9	318505,32	6119104,75		Linear object - part of group	linear	4,89	0,24	0,13		Two linear objects; first log with diameter 20 cm, length 4.7 m, orientation W-E; second log with diameter 15 cm; length 11 m orientation W-E. Partly covered by sand. On the northern side of 4.7 m log lies a boulder 40x40 cm.	Pres. fishing stake w. rope; pres. modern	N	N	N
BP01_VIRSS0038	VIR pick	1,892	318497,43	6119105,19		Linear object - part of group	linear	7,76	0,29	0,09		Two linear objects; first log with diameter 20 cm, length 4.7 m, orientation W-E; second log with diameter 15 cm; length 11 m orientation W-E. Partly covered by sand. On the northern side of 4.7 m log lies a boulder 40x40 cm.	Pres. fishing stake w. rope; pres. modern	N	N	N
BP01_VIRSS0039	VIR pick	1,941	318546,85	6119103,95		Pres. modern line debris	cable	8,88	0,12	0,09		Linear object, diameter 20 cm, length 10.3 m, orientation W-E. Boulder 40x40cm. Mound 80x20 cm. Piece of wood 100x20 cm.	Pres. fishing stake; pres. modern	N	N	N
BP01_VIRSS0040	VIR pick	1,98	318589,54	6119118,91		Linear object. [near] BP01_LI07	linear	6,2	0,15	0,05		Linear object, diameter 20 cm, length 5.8 m, orientation SW-NE, along the southern edge of the log lies something (probably fishermen net) covered in sand and biology. Second object; long and winding fishermen net covered in biology moving from NW to SE.	Pres. fishing stake w. rope; pres. modern	N	N	N

BP01_VIRSS0041	VIR pick	1,992	318596,86	6119092,21		Linear object. [near] BP01_[no_id]	linear	3,32	0,13	0,12		Boulder 50x50 cm. Linear wooden log, diameter 20 cm, length 3 m, orientation SW-NE, covered in biology.	Pres. fishing stake and boulder; pres. modern	N	N	N
BP01_VIRSS0042	VIR pick	1,988	318602,67	6119139,21		Linear object. BP01_Li10	linear	7,14	0,18	0,11		Linear log, diameter 25 cm, length 6.9 m, orientation NW-SE.	Pres. fishing stake; pres. modern	N	N	N
BP01_VIRSS0043	VIR pick		318635,72	6119129,63		Pres. modern line debris. BP01_Li08	cable	13,96	0,23	0,37				I	N	N
BP01_VIRSS0044	VIR pick		318822,10	6119015,66		Wooden shipwreck. Debris field around-. BP01_WR01. MAG37	wreck	17,56	4,15	1,48				I	Y	Marginal
BP01_VIRSS0045	VIR pick		319025,32	6118912,76		2 parallel lines. BP01_[no_id]	linear	9,83	1,28	0,26				I	Y	N
BP01_VIRSS0047	VIR pick	3,162	319707,29	6118750,04		Linear object	linear	7,44	0,54	0,26		Boulders, diameter 50 cm, partly covered by plants. Non man made objects/natural.	Boulders/not found	N	N	N
BP01_VIRSS0048	VIR pick		318808,79	6118924,94		Linear object	linear	5,34	0,17	0,22				I	Y	N
BP01_VIRSS0051	VIR pick		318524,25	6119068,16		Linear object	linear	12,49	0,2	0,1				I	Y	N

BP01_VIRSS0052	VIR pick		323253,15	6117862,53		Linear object	linear	8,25	0,18	0,12				I	Y	N
BP01_VIRSS0053	VIR pick		323069,70	6117916,13		Linear object	linear	6,54	0,28	0,15				I	Y	N
BP01_VIRSS0054	VIR pick		323001,94	6117934,40		Linear object	linear	10,93	0,51	0,15				I	Y	N
BP01_VIRSS0055	VIR pick		322898,89	6118009,39		Linear object	linear	10,51	0,47	0,16				I	Y	N
BP01_VIRSS0056	VIR pick	7,966	324364,09	6117606,81		Small boat; poss. modern	wreck	3,9	1,24	0,25		Boulder approx 40x80 cm, covered by plants.	Y	N	N	N
BP01_VIRSS0057	VIR pick	7,068	323535,74	6117946,36		Linear object	linear	4,96	0,26	0,06		No object found.	Y	N	N	N
BP01_VIRSS0058	VIR pick	2,704	319295,09	6118964,01		Linear object; semi-buried	linear	11,68	0,28	0,3		Boulder, diameter 60 cm.	Boulder/not found	N	N	N
BP01_VIRSS0059	VIR pick	2,907	319514,01	6118976,50		Linear object; wide	linear	8,25	0,91	0,34		No object found.	Boulders/not found	N	N	N

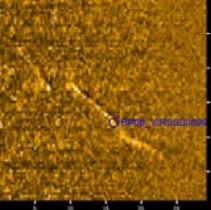
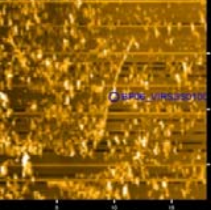
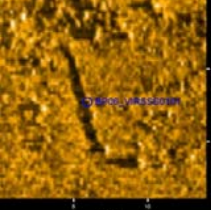
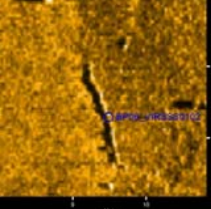
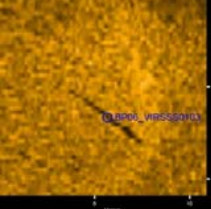
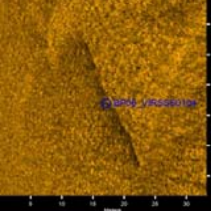
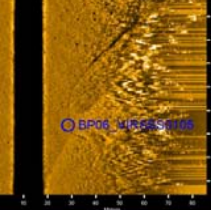
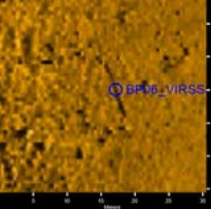
BP01_VIRSS0060	VIR pick	3,236	319827,89	6118890,66		Linear object	linear	6,65	0,15	0,1		Wooden log, diameter 10 cm, length 5 m. Boulder, diameter 60 cm, covered by plants.	Wooden lath; pres. Modern	N	N	N
BP01_VIRSS0061	VIR pick	2,125	318746,22	6119155,74		Linear object; free span	large rocks	3,45	0,32	0,4		Linear wooden log, diameter 15 cm, length 5 m, orientation W-E.	Pres. fishing stake (freespan; sound wood); pres. modern	N	N	N
BP01_VIRSS0062	VIR pick	2,321	318936,12	6119108,55		Linear object. [near] BP01_[no_Id]	linear	6,1	0,24	0,12		No object found.	Boulder/not found	N	N	N
BP01_VIRSS0063	VIR pick	7,549	323981,25	6117763,23		Linear object	linear	4,8	0,25	0,05		Wooden log, diameter 15 cm, length 6.2 m, orientation W-E. Several boulders.	Spar/log/stake (near wreck)	I	Y	Marginal
BP01_VIRSS0064	VIR pick		321595,20	6118296,68		Linear object	linear	6,99	0,2	0,11				I	Y	N
BP01_VIRSS0065	VIR pick		323221,85	6117898,86		Linear object	linear	8,48	0,21	0,08				I	Y	N
BP01_VIRSS0066	VIR pick		323259,60	6117890,95		Linear object; poss. same as BP01_VIRSS0065	linear	6,45	0,14	0,08				I	Y	N
BP01_VIRSS0067	VIR pick	1,419	318048,36	6119268,75		Linear object. BP01_L11	linear	5,12	0,18	0,08		No object found. [First] inspection aborted after CVI because of risk to entangle ROV in the fishing nets	Upon second (complete) inspection: No object similar to sonar anomaly found. Modern rope/not found.	N	N	N

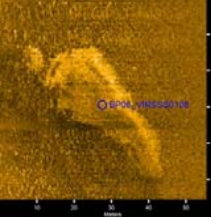
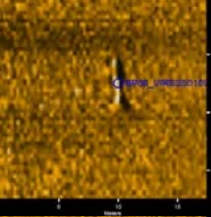
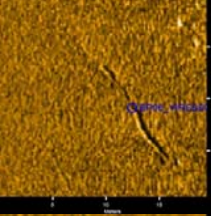

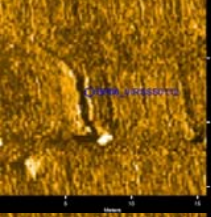
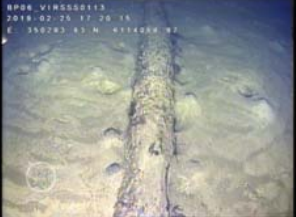
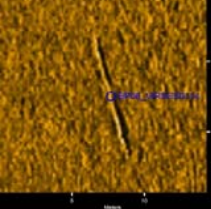
BP01_VIRSS0068	VIR pick		318350,00	6119043,87		Linear object. BP01_L14	linear	6,38	0,2	0,13				I	Y	N
BP01_VIRSS0069	VIR pick		317221,11	6119317,78		Linear object. BP01_L19	linear	4,15	0,24	0,08				I	Y	N
BP01_VIRSS0071	VIR pick	7,687	324232,07	6117902,81		Wreck in nadir strip; vis. in MBES; measurements tentative. BP01_MAG48	wreck	21,13	3,76	2,35		Ship wreck, covering approx. 10x15 m, orientation N-S. Parts of wreck with 1-2 m elevation above seabed. Wooden shipwreck, relatively in good condition. The shipwreck is oriented N-S. 13 m long, 7 m width. Several elements (frames, planks) are scattered around	Wooden shipwreck; almost certainly old	Y	Y	N
BP06_L01	VIR pick	20,19	336361,36	6115491,07								Anchor, length 2.5 m, orientation SW-NE. Another object, log or separated part of anchor found 5 m to the W, length 2 m, orientation N-S.	Y	Y	Y	N
BP06_Li01	VIR pick	20,071	336245,62	6115524,51								Log, slightly bended, diameter 0.2 m, length 3.5 m, orientation W-E, heavily covered by seabed biology.	Pres. stempost or frame element; almost entirely overgrown	I	Y	N
BP06_Li11	VIR pick	38,307	354372,87	6113555,96								No objects found. Small tracks observed in seabed, possibly from cables from fishing-net (trawling) or similar.	Y	N	N	N
BP06_VIRSS0072	VIR pick		333376,87	6115894,71		Linear object; poss. line debris	linear angled	11,3	0,35	0,08				I	Y	N
BP06_VIRSS0073	VIR pick	21,023	337190,72	6115415,49		Linear object	linear angled	6,94	0,34	0,13		Field of boulders and ripplemarks. Linear object, diameter 5 cm, length 8.4 m, orientation W-E. Near the E end of the log a boulder is located; 2 m from the center of the log to the NNE another boulder is located.	Spar/log/stake	I	Y	N

BP06_VIRSS0074	VIR pick	24,229	340379,77	6115081,39		Poss. wreck; evenly spaced protruding elements; obscured by boulder field	unknown	34,73	12,06	0,41		Field of boulders.	Natural boulder field (heterogeneous). Yacht radar reflector (modern)	N	N	N
BP06_VIRSS0075	VIR pick		342779,12	6114913,85		Linear object	linear	18,34	0,84	0,29				I	Y	N
BP06_VIRSS0076	VIR pick		345267,59	6114646,48		Wreck; pres. tug STELLA MOJAC, wrecked 20-11-1976; debris in vicinity. BP06_WR01. MAG2	wreck	23,86	5,78	4,55				I	N	N
BP06_VIRSS0077	VIR pick		345259,62	6114686,32		Line(?) debris near wreck; poss. attached to object either end. BP06_Li06. MAG BP06_2	debris	7,03	0,86	0,76				I	N	N
BP06_VIRSS0078	VIR pick		344871,18	6115019,72		Linear object	linear	5,6	0,74	0,12				I	Y	N
BP06_VIRSS0079	VIR pick		342685,09	6115267,51		Line debris; pres. modern. BP06_Li04	cable	34,55	0,66	0,11				I	N	N
BP06_VIRSS0080	VIR pick		342841,69	6115255,80		Line debris; pres modern. BP06_Li04	cable	75,7	0,75	0,1				I	N	N
BP06_VIRSS0081	VIR pick		342516,17	6115238,85		Linear object	linear angled	7,11	0,77	0,62				I	Y	N

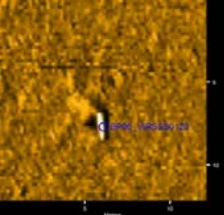
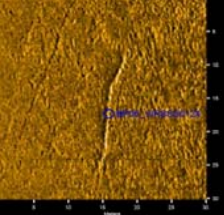
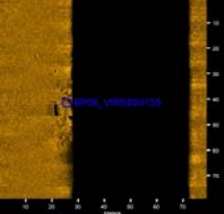





BP06_VIRSS0082	VIR pick		342524,43	6115257,09		Line debris; pres. modern	cable	45,08	0,82	0,14				I	N	N
BP06_VIRSS0083	VIR pick		340435,22	6115363,80		Line debris; pres. modern. BP06_Li03	cable	121,86	0,4	0,14				I	N	N
BP06_VIRSS0084	VIR pick		337570,47	6115668,70		Linear object	linear	11,27	0,74	0,12				I	Y	N
BP06_VIRSS0085	VIR pick		336649,15	6115848,19		Linear object	linear angled	4,55	0,72	0,33				I	Y	N
BP06_VIRSS0086	VIR pick		336942,94	6115746,42		Linear object	linear angled	11,12	0,72	0,15				I	Y	N
BP06_VIRSS0087	VIR pick		337175,99	6115779,36		Linear object. BP06_Li02	linear	9,88	0,39	0,17				I	N	N
BP06_VIRSS0088	VIR pick		333691,91	6116075,70		Poss. debris field	debris	49,05	21,53	0,3				I	Y	N
BP06_VIRSS0089	VIR pick		345399,60	6114758,18		Boat-shaped anomaly; hardly vis. in MBES; poss. debris in vicinity	unknown	48,26	10,17	2,63				I	Y	N

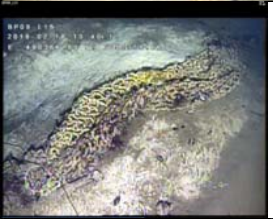



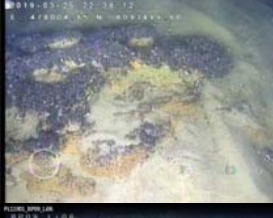
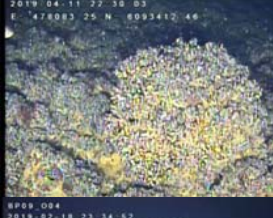
BP06_VIRSS0091	VIR pick		345601,30	6114725,64		Linear object. BP06_L05	linear	6,93	0,56	0,08				I	N	N
BP06_VIRSS0092	VIR pick		344607,06	6114842,10		Linear object. BP06_L04	linear	12,62	0,76	0,26				I	N	N
BP06_VIRSS0093	VIR pick		335811,29	6115760,45		Boat-shaped anomaly in though	unknown	14,31	6,63	0,11				I	Y	N
BP06_VIRSS0094	VIR pick		334462,85	6115902,01		Linear object	linear	21,65	0,56	0				I	Y	N
BP06_VIRSS0095	VIR pick	14,739	330955,84	6116162,61		Linear object; poss. seabed scar	linear	36,16	1,16	0		No object found.	Y	N	N	N
BP06_VIRSS0096	VIR pick	26,48	342602,18	6114704,18		Two parallel linear objects; largest measured	linear	3,85	0,43	0,21		No object found. Boulder Ø40 found during grid survey, being natural.	Y	N	N	N
BP06_VIRSS0097	VIR pick		340672,10	6115506,34		Pres. line debris; not full length measured	cable	76,14	0,37	0,09				I	N	N
BP06_VIRSS0098	VIR pick		350972,15	6113762,92		Linear object	linear	20,26	1,19	0,03				I	Y	N

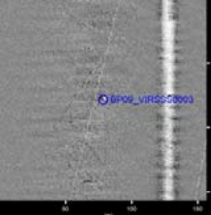
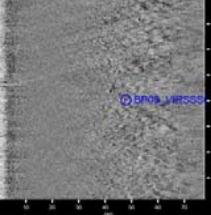

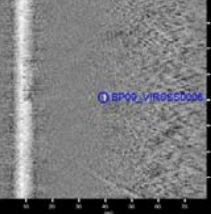
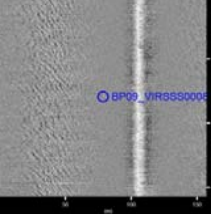
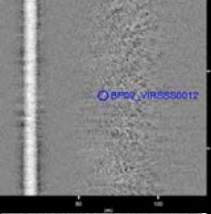
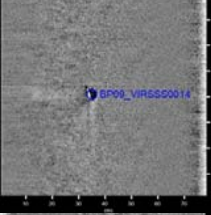
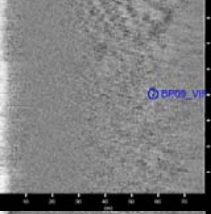
BP06_VIRSS0099	VIR pick		350626,37	6113827,81		Linear object; 1-2 segments	linear angled	25,83	1,24	0				I	Y	N
BP06_VIRSS0100	VIR pick		339395,11	6115222,23		Linear object	linear	10,85	0,46	0,27				I	Y	N
BP06_VIRSS0101	VIR pick		339792,71	6115288,56		Linear object	linear	8,49	0,35	0,2				I	Y	N
BP06_VIRSS0102	VIR pick		338935,20	6115369,72		Linear object. BP06_L02	linear	7,47	0,46	0,16				I	N	N
BP06_VIRSS0103	VIR pick		334283,73	6115842,89		Linear object NMH	linear no height	4,74	0,25	0				I	Y	N
BP06_VIRSS0104	VIR pick	17,042	333236,78	6115877,24		Linear object NMH	linear no height	23,36	0,48	0	No object found.	Y		N	N	N
BP06_VIRSS0105	VIR pick		336679,41	6115199,71		Linear object w. pres. line debris attached/nearby	linear	52,04	0,69	0				I	Y	N
BP06_VIRSS0106	VIR pick		341235,71	6114682,01		Linear object	linear	10	0,62	0,2				I	Y	N

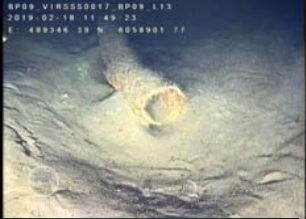
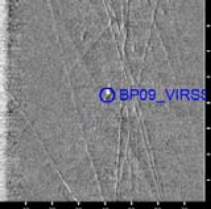

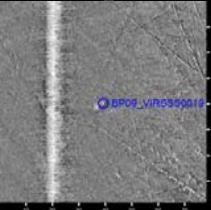

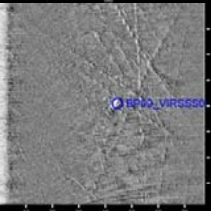

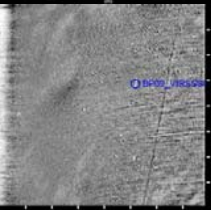
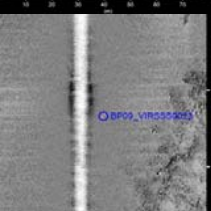
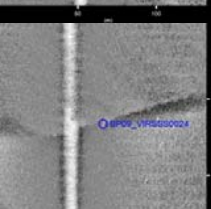
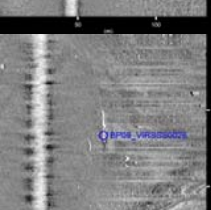
BP06_VIRSS0107	VIR pick		363210,45	6112610,16		Unknown, blurry object. Poss. fish dwelling around obstruction. Poss. MAG BP06_59	unknown	30,55	15,48	0,54					I	Y	N
BP06_VIRSS0108	VIR pick	46,936	362953,13	6112740,51		Unknown, blurry object. Poss. fish dwelling around obstruction	unknown	44,42	17,99	1,46		No object found.	Poss. boulder		N	N	N
BP06_VIRSS0109	VIR pick		354981,53	6113560,10		Linear object	linear	4,28	0,71	0,13					I	Y	N
BP06_VIRSS0110	VIR pick		349482,44	6114225,33		Linear object	linear angled	14,39	0,25	0,12					I	Y	N
BP06_VIRSS0111	VIR pick	32,259	348367,59	6114274,92		Linear object	linear angled	9,33	0,35	0,12		Linear wooden log, man-made. Diameter 20 cm, length 8 m. Partly covered by mussels.	Complex timber/articulated timber construct. Objects in vicinity may be Med./Ren. earthenware sherds!		Y	Y	N
BP06_VIRSS0112	VIR pick	35,065	351157,03	6113968,60		Linear object. [Near] BP06_1454, 1455	linear	4,57	0,33	0,12		Few boulders.	Scattered boulders; some appear dragged by trawl!		N	N	N
BP06_VIRSS0113	VIR pick	34,189	350285,73	6114066,57		Linear object. BP06_L10. MAG BP06_38	linear angled	11,89	0,38	0,14		Linear log, diameter 20 cm, length 12.2 m. orientation NW-SE. Around the middle of the log, on its' NE side an additional small log (or rock) was spotted, several other objects (mainly boulders of different sizes) also spotted scattered around the area.	Pres. fishing stake (pointed); pres. modern		N	N	N
BP06_VIRSS0114	VIR pick		356144,08	6113542,71		Linear object. BP06_L13	linear	9,43	0,3	0,1					I	N	N

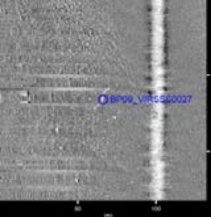
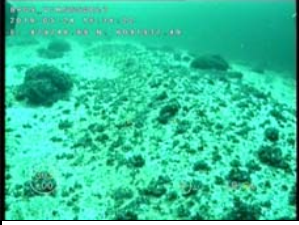
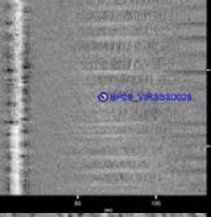
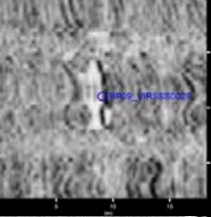
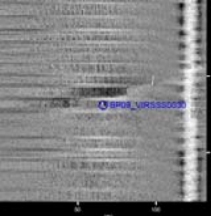
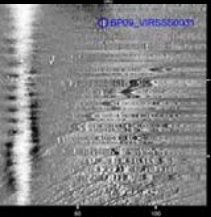
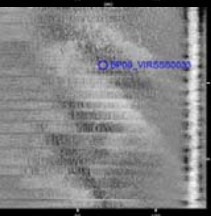
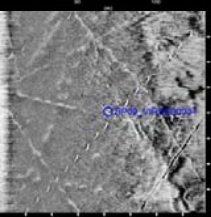
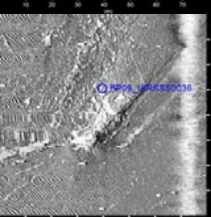
BP06_VIRSS0115	VIR pick	45,187	361223,99	6113006,93		Linear object	linear	5,68	0,24	0,09		Linear wooden object, looks natural, partly covered by plants, diameter 10-15 cm, length 5 m, orientation NW-SE.	Pres. fishing stake (pointed); pres. modern	N	N	N
BP06_VIRSS0116	VIR pick		357965,32	6113678,83		Wreck; surrounding debris field; poss. fishing vessel MARIE K 974, wrecked 11-02-1944. BP06_WR03	wreck	32,76	7,52	3,46				I	Y	N
BP06_VIRSS0117	VIR pick		348867,52	6114497,62		Linear object. BP06_L08	linear	8,66	0,57	0,25				I	N	N
BP06_VIRSS0118	VIR pick		352169,36	6114080,36		Linear object; near wreck. BP06_Li10, L12. MAG BP06_52	linear	5,69	0,46	0,15				I	Y	N
BP06_VIRSS0119	VIR pick		352324,42	6114062,50		Linear object. BP06_L13	linear	3,85	0,6	0,14				I	Y	N
BP06_VIRSS0120	VIR pick		348548,85	6114441,12		Linear object. BP06_Li07	linear	11,35	0,79	0,17				I	Y	N
BP06_VIRSS0121	VIR pick		348608,13	6114527,81		Linear object	linear	8,92	0,51	0,17				I	Y	N
BP06_VIRSS0122	VIR pick		350392,93	6114100,44		Linear object. BP06_L11. MAG BP06_38	linear	11,22	0,4	0,1				I	N	N

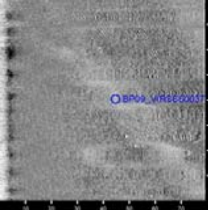

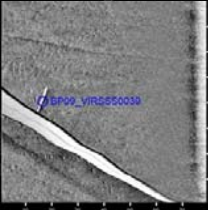

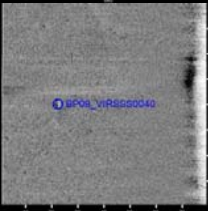
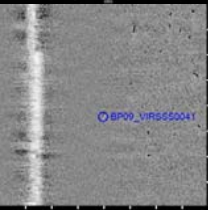
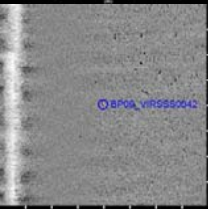
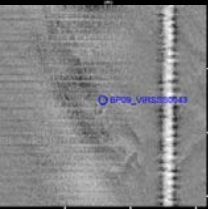
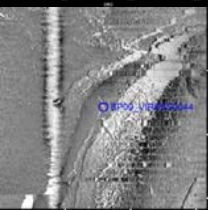
BP06_VIRSS0123	VIR pick		347702,79	6114384,71		Linear object. BP06_45	linear	1,62	0,61	0,22				I	Y	N
BP06_VIRSS0124	VIR pick		359213,36	6113272,46		Linear object NMH. BP06_Li12. Poss. MAG BP06_31	linear no height	18,41	0,32	0				I	Y	N
BP06_VIRSS0125	VIR pick		352179,39	6114085,28		Wreck in nadir strip; vis. in MBES; measurements tentative; pres. schooner AMALIA, wrecked 14-03-1923, allegedly with a cargo of iron. BP06_WR02. MAG BP06_52	wreck	31,94	6,67	1,17				I	Y	N
BP09_L08	VIR pick	184,552	491568,50	6081305,88								Wooden log (natural) ca. 1.5x0.2 m, a bottle and some rubbish lying close by and, towards west, most probably a boulder almost totally covered with marine plants and mussels, inspected together with BP_L08, possibly it the same object	Same as BP09_L09 (?)	N	N	N
BP09_L09	VIR pick	184,546	491569,67	6081313,23								Wooden log (natural) ca. 1.5x0.2 m, a bottle and some rubbish lying close by and, towards west, most probably a boulder almost totally covered with marine plants and mussels, inspected together with BP_L09, possibly it the same object	Metal(?) pipe and bottle. Another bottle, an angular object, and few boulders in vicinity. All most likely modern	N	N	N
BP09_L11	Seabed clearance target	198,352	489686,66	6067753,71								wooden mast from a small ship partially buried, ca. 7m long, potentially archeological	Y	Y	Y	Marginal
BP09_L12	Seabed clearance target	202,248	489232,25	6063883,73								wooden log (beam/bar), ca. 3-4 m long, mmo or natural, a piece of rubbish (most probably a lastic bag) lying next to it, the same object as BP09_VIRSS0020 and BP09_VIRSS0019		I	(Y)	N
BP09_L13	Seabed clearance target	207,287	489339,21	6058903,11								mmo- pipe or tube, ca. 15 cm in diameter, the same as the target BP09_VIRSS0017		I	N	N

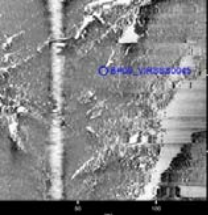
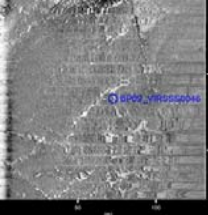
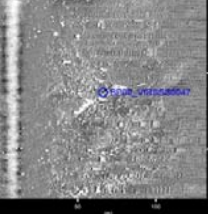
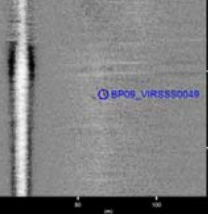
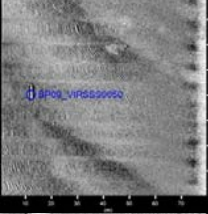

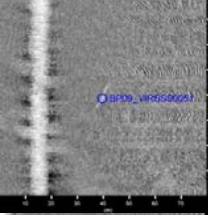

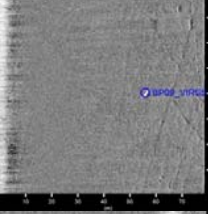
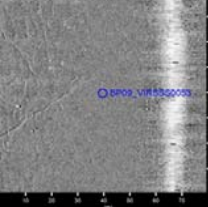
BP09_L15	Seabed clearance target	213,916	490360,74	6052353,90						mmo-rubbish: entangled rope or fishing nets	Fishing net, modern	N	N	N
BP09_L16	Seabed clearance target	216,871	490722,06	6049419,64						wooden log (beam/bar) ca. 3-4m long, mmo or natural, inspected together with BP09_VIRSS0006 as, most probably, it is the same object		I	(Y)	N
BP09_L18	Seabed clearance target	217,462	490868,15	6048843,83						no object found, target possibly chosen for roV-inspection based on a small pocket/hole in the seabed visible on sss, inspection combined with seabed clearance target ID=BP09_VIRSS0016		I	N	N
BP09_L19	Seabed clearance target	219,412	491252,06	6046929,60						mmo-modern: very thin, long object (fishing beam/stick), rubbish, a boulder situated south and a small piece of wood in the E-direction, possibly also rubbish	Metal(?) rod/pipe, boulder, linear object up against boulder. All. pres. modern	N	N	N
BP09_L25	Seabed clearance target	216,738	491020,85	6049599,54						wooden log	Spar/log/stake; pres. same as BP09_VIRSS0012	I	(Y)	N
BP09_LI04	Seabed clearance target	166,208	478011,21	6093480,78						Some kind of outcrop, length 17 m.	Unknown; pres. geol.	N	N	N
BP09_LI06	Seabed clearance target	166,32	478084,15	6093411,68						Boulder, diameter 40cm and Boulder, diameter 80cm	Y	N	N	N
BP09_O04	VIR pick	188,724	491404,59	6077187,95						boulder, probably leftover related to Nord Stream pipeline rock dumping	Scattered boulders; conspicuous row of boulders	N	N	N

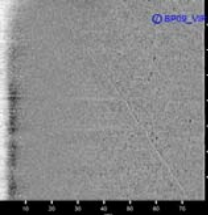
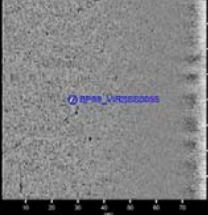
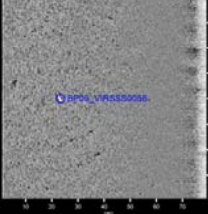
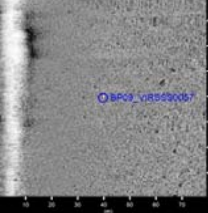
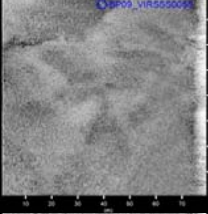
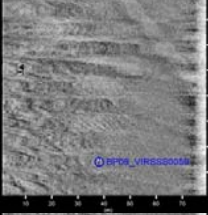
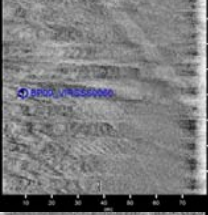
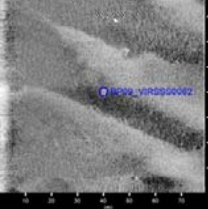

BP09_VIRSS0003	VIR pick		488496,89	6061615,09		Linear object; poss. w. branch	linear	5,68	0,94	0,11				I	Y	N
BP09_VIRSS0005	VIR pick	216,085	490629,04	6050200,61		Linear object	linear	3,18	0,18	0,05		mmo-probably modern: flat wooden log or a board (plank), diameter ca. 0.5 m	Worked, though somewhat irregular plank. No apparent fasteners	I	Y	Total (however, max. lay-avoid accepted)
BP09_VIRSS0006	VIR pick	216,866	490724,36	6049424,52		2 linear objects. BP09_L16	linear angled	3,42	0,24	0,24		wooden log (beam/bar) ca. 3-4m long, mmo or natural, inspected together with ID=BP09_L16 as, most probably, it is the same object	Curved, maybe tapering, timber of sub-rectangular cross-section. No apparent fasteners	I	Y	Marginal
BP09_VIRSS0008	VIR pick		491794,50	6045375,49		Linear object	linear	3,97	0,26	0,23				I	Y	N
BP09_VIRSS0012	VIR pick		491023,55	6049597,58		Linear object	linear	4,38	0,7	0,18				I	Y	N
BP09_VIRSS0014	VIR pick		491478,76	6045358,27		Unknown, angular object. BP09_B9731	unknown	4,94	3	0,27				I	Y	N
BP09_VIRSS0015	VIR pick	217,635	490886,27	6048671,66		Unknown curved debris	debris	4,19	0,78	0,04		No object found, target possibly chosen for roV-inspection based on a small pocket in the seabed visible on sss	Y	N	N	N
BP09_VIRSS0016	VIR pick	217,455	490863,75	6048850,07		Linear object. BP09_L18	linear	2,91	0,61	0,23		no object found, target possibly chosen for roV-inspection based on a small pocket in the seabed visible on sss, inspection combined with seabed clearance target ID=BP09_L18	Y	N	N	N

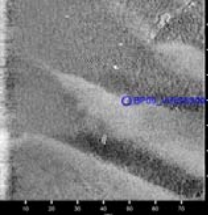
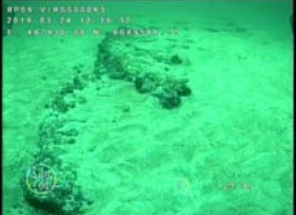
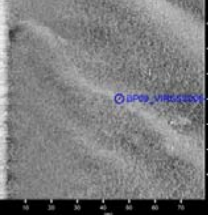

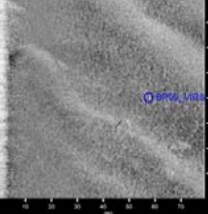

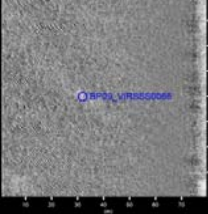
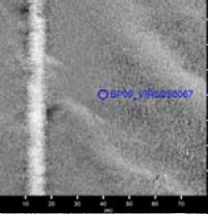

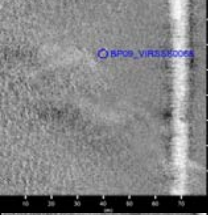
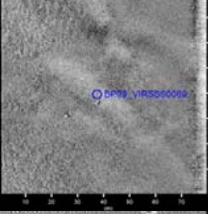
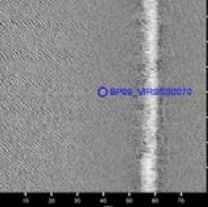
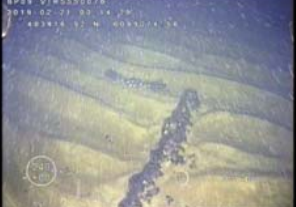
BP09_VIRSS0017	VIR pick	207,289	489349,33	6058903,07		Linear object. BP09_L13	linear	3,5	0,72	0,16		mmo-modern: pipe or tube, ca. 15 cm in diameter, the same as the target BP09_L13	Metal(?) pipe and other debris in pronounced scour pit	N	N	N
BP09_VIRSS0018	VIR pick	202,954	489096,58	6063190,06		Unknown; w. linear structures/branches	debris	7,98	2,35	0,08		Entangled fishing nets or a small natural biological form, ca. 0.2-0.3 cm, situated inside a small pocket	Fishing net in pronounced scour pit	N	N	N
BP09_VIRSS0019	VIR pick	202,245	489232,42	6063885,97		Linear object; semi-buried. BP09_L12	linear	6,9	0,62	0,21		Wooden log (beam/bar), ca. 3 m long and ca. 0.3m wide, a piece of rubbish (most probably a lastic bag) lying next to it, the same object as BP09_VIRSS0020 and BP09_L12	Spar/log/stake	I	(Y)	N
BP09_VIRSS0020	VIR pick	202,242	489221,74	6063890,67		Linear object in pit	linear	3,93	0,58	0,11		Wooden log (beam/bar), ca. 3 m long and 0.3m wide, a piece of rubbish (most probably a lastic bag) lying next to it, the same object as BP09_VIRSS0019 and BP09_L12	Same as BP09_VIRSS0019 (?)	I	Y	N
BP09_VIRSS0021	VIR pick		465395,17	6099366,48		Linear object	linear angled	5,12	0,22	0,08				I	Y	N
BP09_VIRSS0023	VIR pick		489895,09	6083050,05		Linear object	linear	5,26	0,41	0,19				I	Y	N
BP09_VIRSS0024	VIR pick		483180,09	6088927,22		Linear object. BP09_L05	linear	7,92	0,4	0,34				I	N	N
BP09_VIRSS0026	VIR pick		477652,85	6093873,35		Area w. parallel linear objects	linear	47,2	10,43	0,6				I	Y	N

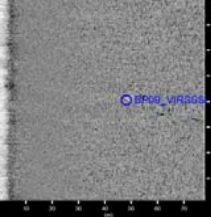
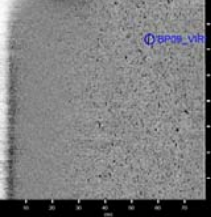

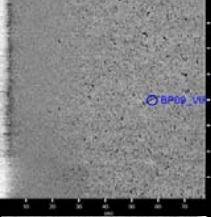

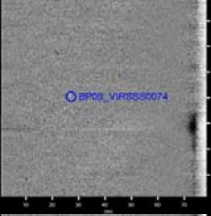
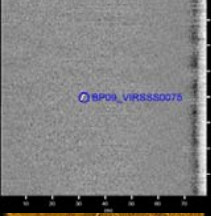
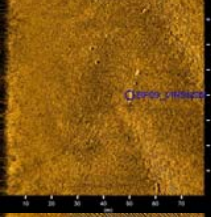
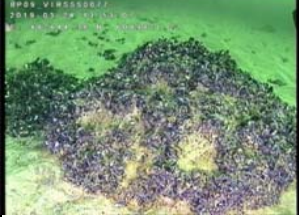
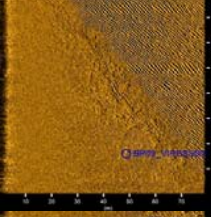
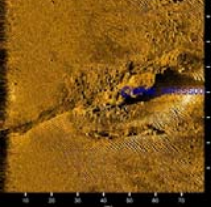
BP09_VIRSS0027	VIR pick	168,542	479736,92	6091941,45		Linear object; poss. wire debris	linear angled	17,33	0,67	0,26		Unknown object, thickness 10 cm, length 5 m, maybe clay formation or some kind of outcrop. FHR: Debris - field of stones and outcrop. Non MMO.	Y	N	N	N
BP09_VIRSS0028	VIR pick		481613,14	6090416,96		Linear object	linear	4,03	1,04	0,31				I	Y	N
BP09_VIRSS0029	VIR pick		482742,09	6089274,34		Linear object; poss. line debris; maybe part of BP09_VIRSS0088	linear angled	6,88	0,55	0,3				I	Y	N
BP09_VIRSS0030	VIR pick		483142,41	6088916,13		Linear object; poss. w. branch. BP09_B7661	linear angled	4,47	1,22	0,13				I	Y	N
BP09_VIRSS0031	VIR pick		477769,03	6093913,84		Linear object; pres. line debris (or moving object); this pos. conf. in MBES	linear	12,49	0,97	0,27				I	Y	N
BP09_VIRSS0033	VIR pick		482970,70	6089210,28		Linear object. BP09_B7651	linear	8,17	0,58	0,53				I	Y	N
BP09_VIRSS0034	VIR pick		460890,67	6100398,01		Linear object	linear	5,93	0,47	0,09				I	Y	N
BP09_VIRSS0036	VIR pick		478095,77	6093642,34		Poss. wreck; debris field w. linear features. Poss. surrounding linear debris	debris	39,49	16,61	1,49				I	Y	N

BP09_VIRSS0037	VIR pick	172,666	483006,21	6089452,74		Linear object	linear	6,37	0,35	0,09		Linear wooden object ca. 4.35 m long and Ø25 cm, partially covered in sand.	Several wooden objects; poss. MMOs; (some) poss. fallen trees. Heavily encrusted in mussels	I	Y	N
BP09_VIRSS0038	VIR pick	179,267	487971,30	6085104,05		3 linear objects, longest measured. BP09_B7721, BP09_B7726	linear	4,75	0,48	0,05		No object found.	Scattered debris; pres modern	N	N	N
BP09_VIRSS0039	VIR pick	188,547	491388,91	6077383,16		Linear object resting against pipeline. Poss. MAG2	linear	11,06	0,54	0,15		Wooden log, carried by the water and abandoned next to the Nord Stream pipeline	Fishing stake (pointed); pres. modern	N	N	N
BP09_VIRSS0040	VIR pick		491675,08	6079745,49		Linear object in pit. BP09_B9036, BP09_B9045	linear	3,63	0,36	0,09				I	Y	N
BP09_VIRSS0041	VIR pick		489152,69	6083952,81		Linear object	linear angled	3,1	0,41	0,18				I	Y	N
BP09_VIRSS0042	VIR pick		489036,84	6084045,83		Linear object. BP09_B8104	linear	2,26	0,48	0,07				I	Y	N
BP09_VIRSS0043	VIR pick		482831,02	6090153,81		Linear object	linear	4,4	0,66	0,28				I	Y	N
BP09_VIRSS0044	VIR pick		478472,28	6093859,13		Debris field w. linear features (poss. same as BP09_VIRSS0045)	debris	78,89	50,17	0,64				I	Y	N

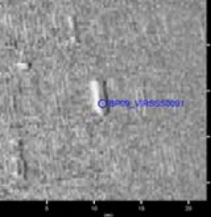
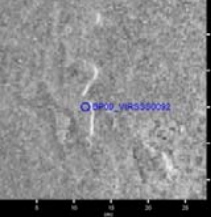
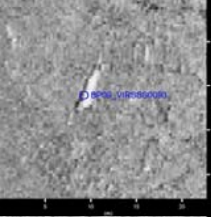
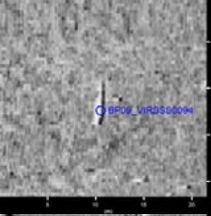
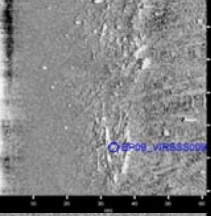
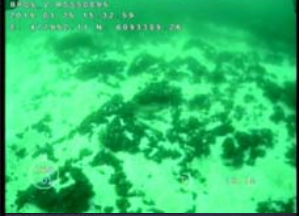
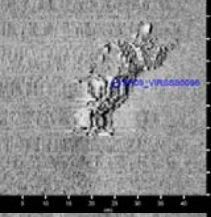

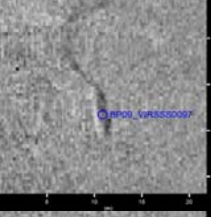

BP09_VIRSS0045	VIR pick		478357,41	6093809,76		Debris field w. linear features (poss. same as BP09_VIRSS0044). BP09_B12026	debris	111,62	87,55	0,98				I	Y	N
BP09_VIRSS0046	VIR pick		478216,86	6093877,74		Linear object (poss. part of BP09_VIRSS0044/0045)	linear	17,87	0,91	0,15				I	Y	N
BP09_VIRSS0047	VIR pick		477422,71	6094591,89		Linear object; poss. longer and semi-buried. BP09_B5015	linear	16,41	1,42	1,28				I	Y	N
BP09_VIRSS0049	VIR pick		490699,32	6082895,36		2 linear objects, NMH; longest measured	linear no height	4,89	0,44	0				I	Y	N
BP09_VIRSS0050	VIR pick	172,631	483048,23	6089554,63		1-2 parallel linear objects; poss. connected. Poss. railing. BP09_B7650	linear	8,27	2,3	0,15		Wooden log, the longest one is ca. 5 m long, small wooden elements, dark object ca. 40 x 60 cm - can it be tar? Next wooden log ca 3 m long found at the last profile - profiles extended. Objects can be related to targets: BP09_VIRSS0051/64/65/67/37. MMO, archaeology.	Several wooden objects; poss. MMOs; poss. fallen trees. Heavily encrusted in mussels	I	Y	N
BP09_VIRSS0051	VIR pick	172,609	482971,42	6089500,86		Linear object. Poss line debris	linear	12,2	0,26	0,17		Wooden log, length 12 m, diameter 30 cm, orientation NW-SE, covered by biological formation.	Several wooden objects; poss. MMOs; poss. fallen trees. Heavily encrusted in mussels. Gytja/peat under thin sand veneer	I	Y	N
BP09_VIRSS0052	VIR pick		491723,86	6074833,21		Linear object	linear	3,42	0,39	0,2				I	Y	N
BP09_VIRSS0053	VIR pick		490643,41	6077002,16		Linear object; poss. line debris	linear angled	8,92	0,22	0,06				I	Y	N

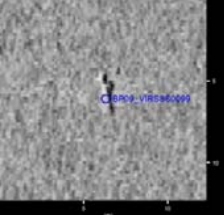
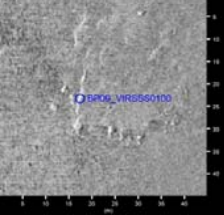



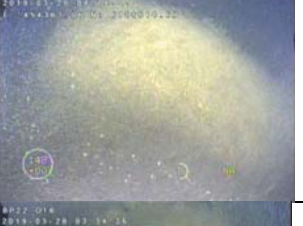

BP09_VIRSS0054	VIR pick		489707,03	6084670,22		Linear object	linear	2,45	0,46	0,08				I	Y	N
BP09_VIRSS0055	VIR pick		487925,96	6085644,85		Linear object	linear	2,45	0,65	0,21				I	Y	N
BP09_VIRSS0056	VIR pick		487882,19	6085600,08		Linear object	linear	4,83	0,48	0,2				I	Y	N
BP09_VIRSS0057	VIR pick		487404,66	6084929,74		One or more linear objects	linear	2,6	0,23	0,17				I	Y	N
BP09_VIRSS0058	VIR pick		483116,22	6089134,22		Linear object	linear	5,03	0,32	0,15				I	Y	N
BP09_VIRSS0059	VIR pick		460739,06	6101125,81		Linear object in pit	linear	4,35	0,45	0,13				I	Y	N
BP09_VIRSS0060	VIR pick		460702,64	6101097,54		Linear object w. protruding elements	linear	4,58	0,78	0,33				I	Y	N
BP09_VIRSS0062	VIR pick	172,508	482915,88	6089589,77		2 parallel linear objects	linear	4,4	1,65	0,17		Unknown object, thickness 10 cm, length 5 m, maybe clay formation or some kind of outcrop. Probably non MMO, natural. (BP09_VIRSS0062 the same object as BP09_VIRSS0063)	Peat/gyttja outcrop	N	N	N





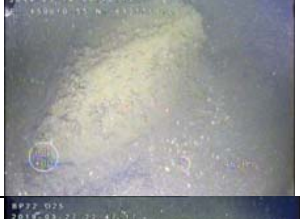



BP09_VIRSS0063	VIR pick	172,524	482933,35	6089586,26		Linear object	linear	2,79	0,16	0,11		Unknown object, thickness 10 cm, length 5 m, maybe clay formation or some kind of outcrop. Probably non MMO, natural. (BP09_VIRSS0062 the same object as BP09_VIRSS0063)	Peat/gyttja outcrop	N	N	N
BP09_VIRSS0064	VIR pick	172,621	483004,15	6089519,98		Linear object NMH	linear no height	4,54	0,25	0		First wooden log mostly covered by sand and biological formation. It is ca. 3.8 m long. West end if more exposed, it is bigger and looks like wooden stump. The first object looks natural, however most part of it is buried and it is close to BP09_VIRSS0037/67/51/65. Two more objects (ca. 4 m and 2.5m) object were found ca. 12 m to the south; one was hewn and it is man-made (archaeological), another one if fully covered by biological formations and half buried. Small wooden object - ca. ca. 0.8-1 m to north-west from the as given coordinate. Next wooden log (frame) to the east from the center position (to the south from BP09_VIRSS0050). Small dark object - tar? (combined with BP09_VIRSS0063)	Several wooden objects; Pres. fallen trees. Heavily encrusted in mussels. Pres. peat chunks	N	N	N
BP09_VIRSS0065	VIR pick	172,631	483019,29	6089521,65		Linear object. BP09_B7649	linear	3,38	0,46	0,12		First wooden log mostly covered by sand and biological formation. It is ca. 3.8 m long. West end if more exposed, it is bigger and looks like wooden stump. The first object looks natural, however most part of it is buried and it is close to BP09_VIRSS0037/67/51/65. Two more objects (ca. 4 m and 2.5m) object were found ca. 12 m to the south; one was hewn and it is man-made (archaeological), another one if fully covered by biological formations and half buried. Small wooden object - ca. ca. 0.8-1 m to north-west from the as given coordinate. Next wooden log (frame) to the east from the center position (to the south from BP09_VIRSS0050). Small dark object - tar? (combined with BP09_VIRSS0064)	Several wooden objects; Pres. fallen trees. Heavily encrusted in mussels. Pres. peat chunks	N	N	N
BP09_VIRSS0066	VIR pick		482904,91	6089482,74		Group of linear objects	linear	5,81	1,65	0,09				I	Y	N
BP09_VIRSS0067	VIR pick	172,654	483015,28	6089482,71		Poss. linear object	linear	3,81	0,25	0,21		Wooden log, length 6 m, diameter 30 cm, orientation NW-SE, covered by biological formation.	Log/fallen tree	N	N	N
BP09_VIRSS0068	VIR pick		483022,57	6089403,40		Linear object	linear	5,22	0,32	0,11				I	Y	N
BP09_VIRSS0069	VIR pick		483081,95	6089335,17		Linear object. BP09_B7657, BP09_B7658	linear	2,25	0,45	0,07				I	Y	N
BP09_VIRSS0070	VIR pick	173,224	483415,17	6089073,37		Linear object	linear	4,89	0,25	0,21		Linear wooden object ca. 4.2 m long, covered in sand.	Wooden linear objects; the largest/most exposed w. fasteners. Heavily encrusted in mussels	I	Y	N




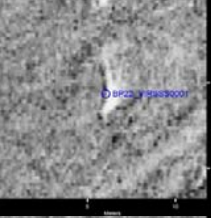
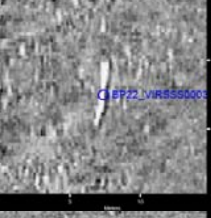


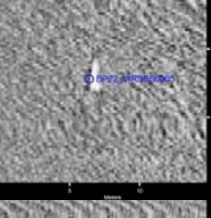

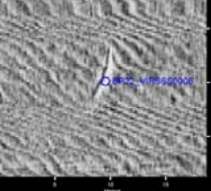

BP09_VIRSS0071	VIR pick	178,542	487452,07	6085611,06		Linear object	linear	2,9	0,45	0,18		No object found. Wooden object covered with plant and mussels found during grid survey, probably moved by waves.	Target is probably a length of flex hose c. 15 m from target pos.	N	N	N
BP09_VIRSS0072	VIR pick	179,36	488073,08	6085078,34		Linear object	linear	5,5	0,48	0,12		mmo, ca. 4 m long straight wooden object (beam/bar) or an old mast), diameter ca. 10 cm, significant plant and mussels accumulations along the object, possibly small fishing net next to the object or, more likely, biological form	Spar/log/stake. Many small MMOs in vicinity. Some modern fishing net	I	Y	Marginal
BP09_VIRSS0073	VIR pick	180,091	488628,09	6084602,82		Linear object NMH. BP09_B7908	linear no height	7,37	0,56	0		mmo-modern, a tire with pieces of fishing nets, spread out o the length of ca. 10m, totally covered with thin layer of marine sediments and plants	Line debris w. tire attached. Smaller MMOs in vicinity thus most likely also modern	N	N	N
BP09_VIRSS0074	VIR pick		489521,00	6083672,52		Linear object. BP09_B8192	linear	2,24	0,24	0,13				I	Y	N
BP09_VIRSS0075	VIR pick		489997,43	6083266,54		Linear object. BP09_L06	linear	3,77	0,34	0,17				I	Y	N
BP09_VIRSS0077	VIR pick	172,138	482643,12	6089840,19		Linear object; poss. semi-buried	linear	14,08	1,34	0,06		Boulders, diameter 50-100 cm.	Wrong/insufficient area covered. Later re-surveyed, and object no longer present in area; pres. modern, movable object	I	N	N
BP09_VIRSS0078	VIR pick		480263,20	6091920,76		Linear object	linear	6,06	0,33	0,08				I	Y	N
BP09_VIRSS0079	VIR pick		477979,03	6093925,92		Poss. wreck; no other good files. Poss. geology	unknown	25,12	7,96	2,6				I	Y	N

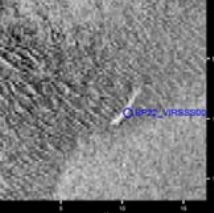

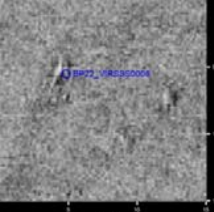




BP09_VIRSS0080	VIR pick		489223,46	6063883,51		Prob. MMO; poss. ass. w. BP09_VIRSS0019 & 0020	unknown	0	0	0				I	N	N
BP09_VIRSS0081	VIR pick		446049,05	6103798,60		Linear object; poss. object attached one end	linear	23,48	1,68	0,23				I	Y	N
BP09_VIRSS0082	VIR pick		489880,67	6066236,01		Linear object; poss. smaller fragments nearby	linear	9,8	0,74	0,08				I	Y	N
BP09_VIRSS0083	VIR pick		445231,16	6103426,50		Linear object	linear	8,96	1,43	0,04				I	Y	N
BP09_VIRSS0084	VIR pick		445595,54	6103323,55		Curved linear object NMH	linear angled	13,3	2,82	0				I	Y	N
BP09_VIRSS0088	VIR pick		482752,83	6089285,88		Poss. wreck. Debris field w. linear features. BP09_VIRSS0029 and 0100 may be part hereof	debris	54,06	40,21	0,25				I	Y	N
BP09_VIRSS0089	VIR pick		480732,44	6091099,02		Linear object, NMH	linear no height	11,32	1,44	0				I	Y	N
BP09_VIRSS0090	VIR pick		477904,93	6093411,24		Linear object; maybe more in vicinity	linear	9,47	0,53	0,23				I	Y	N

BP09_VIRSS0091	VIR pick		479189,72	6092097,80		Oval to rectangular object	unknown	3,87	0,86	0,25				I	Y	N
BP09_VIRSS0092	VIR pick		479908,98	6091405,53		2 linear objects, NMH	linear no height	9,7	0,37	0				I	Y	N
BP09_VIRSS0093	VIR pick		479441,91	6091791,78		Linear object	linear	6,89	0,67	0,32				I	Y	N
BP09_VIRSS0094	VIR pick		482628,93	6089124,15		Linear object	linear	4,75	0,57	0,19				I	Y	N
BP09_VIRSS0095	VIR pick	166,27	477950,02	6093323,01		Poss. wreck. Field/trail of linear features	debris	57,42	10,39	0,5		Probably field of outcrop/natural formation. Whole objects are cover by mussels. The shape could suggest on SSS the shipwreck. Probably non MMO, natural. Length 30 m.	Y	N	N	N
BP09_VIRSS0096	VIR pick	164,6	476557,35	6094305,29		Poss. wreck/ballast pile	mound	29,61	10,2	0,78		Field of stones, diameter less than 50 cm.	Y	N	N	N
BP09_VIRSS0097	VIR pick		479916,56	6091340,18		Oval to rectangular object; poss. something attached	unknown	6,13	1,27	0,15				I	Y	N
BP09_VIRSS0098	VIR pick		482684,04	6088704,73		Linear object	linear	4,92	0,44	0,28				I	Y	N

BP09_VIRSS0099	VIR pick		482673,78	6088729,62		Linear object	linear	0	0,39	0,07				I	Y	N
BP09_VIRSS0100	VIR pick		482648,10	6089245,82		Linear object in poss. debris field. Poss. part of BP09_VIRSS0088	linear	15,04	0,35	0,07				I	Y	N
BP22_L05	Seabed clearance target	149,475	464404,16	6102919,52								Biological form. Diameter 30-40 cm, seabed erosion of 25 cm around object.	MMO (pres. modern) or angular boulder in scour pit	N	N	N
BP22_O13	Seabed clearance target	137,705	453429,64	6106635,00								Boulder ca. 1.5 m. Natural.	Y	N	N	N
BP22_O14	Seabed clearance target	138,488	454212,72	6106615,24								Boulder. Diameter 0.4 m	Y	N	N	N
BP22_O15	Seabed clearance target	138,633	454357,73	6106614,61								Boulder. Diameter 1.0 m	Y	N	N	N
BP22_O16	Seabed clearance target	138,943	454667,94	6106626,34								Boulder. Diameter 0.5 m	Y	N	N	N
BP22_O17	Seabed clearance target	139,484	455210,22	6106760,96								OBJECT NOT FOUND	Y	N	N	N

BP22_O19	Seabed clearance target	142,125	457712,47	6105964,54						Boulder. Diameter 0.7 m	Y	N	N	N
BP22_O20	Seabed clearance target	142,825	458400,48	6105790,37						Boulder. Diameter 0.5 m	Y	N	N	N
BP22_O21	Seabed clearance target	142,854	458401,38	6105729,66						Boulder. Diameter 0.2 m	Y	N	N	N
BP22_O22	Seabed clearance target	142,85	458420,02	6105772,41						Boulder. Diameter 0.5 m	Y	N	N	N
BP22_O23	Seabed clearance target	143,291	458809,89	6105567,67						Boulder. Diameter 1.0 m	Y	N	N	N
BP22_O25	Seabed clearance target	145,709	460970,91	6104481,65						Boulder. Diameter 0.4 m	Y	N	N	N
BP22_O26	Seabed clearance target	145,72	460973,69	6104463,60						Boulder. Diameter 0.5 m	Y	N	N	N
BP22_O27	Seabed clearance target	145,721	460977,28	6104467,93						Boulder. Diameter 0.5 m	Y	N	N	N

BP22_O30	Seabed clearance target	145,764	460997,25	6104412,12							Boulder. Diameter 0.6 m	Y	N	N	N	
BP22_O31	Seabed clearance target	145,787	461139,09	6104636,38							Broken fishing net - modern rubbish. + small stone or small hillock covered by sea animals. Similar to object BP_O25, BP22_O26 and BP22_O27. MMO.	Y	N	N	N	
BP22_O33	Seabed clearance target	155,801	469857,51	6099697,63							Several boulders. Smaller boulders with diameter; 0.3 m and few big; diameter 1.5m; covered by mussels. Natural.	Boulders and large, angular (stone?) slabs	I	Y	Marginal	
BP22_VIRSS0001	VIR pick	134,488	450214,04	6106773,29		(Curved) linear object	linear angled	3,4	0,4	0,27		OBJECT NOT FOUND	Y	N	N	N
BP22_VIRSS0003	VIR pick	152,141	466662,11	6101484,02		Linear object	linear	4,88	0,37	0,16		Square object, 10x10cm, 3.9 m long. Partly covered by biological plants and mussels. Orientation WNW-ESE.	Wooden (deck) beam; slightly curved; almost certainly old	Y	Y	N
BP22_VIRSS0004	VIR pick		465802,09	6101942,44		Object w. one straight edge; poss. semi-buried	unknown	7,13	2,96	0,21				I	Y	N
BP22_VIRSS0005	VIR pick	156,438	470446,40	6099448,78		Linear object	linear	2,32	0,4	0,2		Wooden log, ca. 3m long, Ø=0.3m. Probably natural - wooden stump. Non MMO, natural.	Spar/log	I	Y	Marginal
BP22_VIRSS0006	VIR pick	159,382	473043,12	6098062,13		Linear object	linear angled	5,06	0,43	0,12		A cable, hose or wire, covered by biological formation. Modern rubbish. Modern MMO, modern rubbish.	Hose, modern	N	N	N

BP22_VIRSS0007	VIR pick	156,469	470426,18	6099342,70		Linear object	linear	3,5	0,33	0,26		Wooden log, ca. 4 m long, $\phi=0.2m$, one end covered by mussels. Probably natural - wooden stump. Non MMO, natural.	Spar/log/stake	I	Y	N
BP22_VIRSS0008	VIR pick	149,173	463991,73	6102783,05		Linear object in poss. debris field	linear	2,98	0,71	0,09		No object found. Three minor dips/holes in seabed.	Y	N	N	N
BP22_VIRSS0010	VIR pick		469114,03	6099482,89		Linear object; poss. objects attached either end	linear	4,97	0,41	0,43				I	Y	N
Contact0155	BM pick	132,97	448695,70	6106796,94								3 small wooden boards, probably modern man-made.	Y	N	N	N
Contact0163	BM pick	132,216	447941,86	6106773,07								OBJECT NOT FOUND	Y	N	N	N
M-806-0002-NHP	NBU observation (UXO campaign)	44,246	360280,10	6112972,60				10	5	1,5		During the 10x10m grid survey found TSS440 hit of 1817microvolts, object (wooden structure with metal parts) found. A visual on the object, following dredging operations, revealed that the object turned out to be too big to relocate with the ROV, on client's request a MBES grid survey was conducted over the area. Target of possible archaeological interest. Two items of debris - metal relocated 50m North of route centreline. Both items have been wet stored at the same location (360278,8 mE/6113033,1 mN)	Man-made object; wooden and metallic parts. MAG footprint (c. 20x7m plus surrounding smaller anomalies) consistent with typical vessel size pre-WW1.	I	Y	N (when rerouted locally)

VIR file no. 2813

Baltic Pipe, DK-PL

General:

The ROV should be configured with the best possible camera and lights available.

Camera field of view should be clear of obstructions from the ROV itself, camera dome, reflections from dome, etc.

Lights should be placed and adjusted so as to avoid - as far as possible - illuminating particles in the water column.

Often better results are achieved with natural, ambient light only. If needed, try both.

The ROV must be positioned using LBL/USBL. A mappable log file (CSV, SHP or similar) must be delivered for each dive/target. This file should as a minimum contain the following columns: easting, northing, depth, heading, timestamp. If possible, also log "event"-markers for example to indicate saved still photos or other points of interest – with description. Abort dive if logging fails and repeat when fixed.

The ROV should always be piloted by a highly skilled pilot, capable of manoeuvring delicately without colliding with the object or stirring up silt, etc. For the same reason proper tether management is important.

An ROV technician should be on board in case of equipment or software failure.

Procedure:

The first objective is to **locate** the target on the seabed, starting from the coordinates in the target catalogue and moving out to a distance covering the accumulated positioning error. Currently a square, 25 x 25 m area centred on the target coordinates is thought to be enough. *However, this is pending information on the ROV's own positioning accuracy.* Use a line spacing that matches visibility on the day so as to achieve full visual coverage. If the object is not found within this area, the dive can be aborted. This decision can be made by the pilot.

If/when the object is found, the next objective is to **identify** it. Do - as a minimum - a complete 360° fly-over, viewing the object from all sides and if needed from different altitudes. Add close-ups of important details. If the object is *clearly not man-made* or *clearly modern*, the dive can be aborted. This decision is normally made by an on-board archaeologist. For the present project we suggest, that the pilot can decide so, if: 1) the object found is clearly similar to the sonar target in shape and size AND 2) it is either clearly not man-made or clearly modern.

If the object is man-made and not clearly modern, the third objective is to **determine its extent** – including loose parts/fragments – on the surrounding seabed. Ideally, the full suggested exclusion zone should be covered; however, in normal Baltic visibility this is rarely possible within reasonable time. Normally the on-board archaeologist would decide when it is safe to abort the dive; for the present project we can only advice using common sense: make the best use of the ROV's sonar to seek out protruding objects in the vicinity; look at the sediment to assess whether there is a possibility for sediment-covered objects or not; possibly give priority to the sector towards the proposed pipeline route... A suggested minimum coverage is

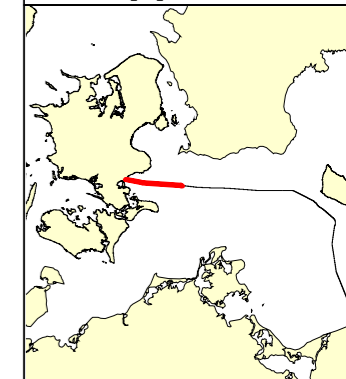
25 m around the perimeter of visible object(s) – at least in the direction of the pipeline route. Any loose parts found should be documented in the same manner as the main object (see above).

At this stage the objects must remain undisturbed. (Sampling etc. requires permission from the Heritage Agency).

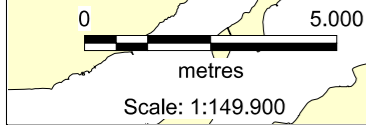
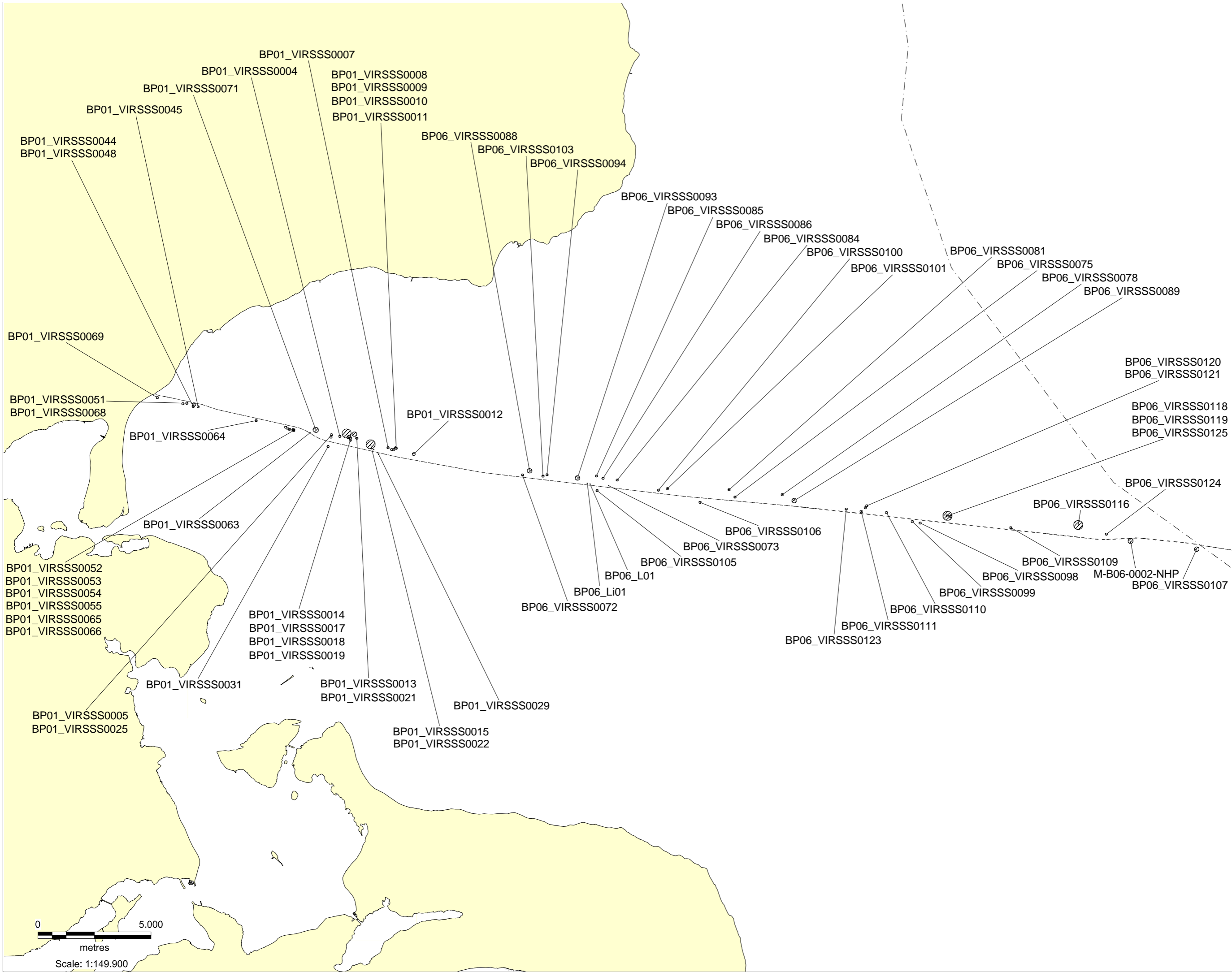
Deliverables:

Upon return, the following should be delivered to VIR (for all dives; also where nothing was found):

1. Video files; named/indexed in a manner that clearly explains which file(s) belong to which target.
2. ROV trackplot (see above); also aptly named.
3. Target reports (if any)
4. ROV sonar files (if any)



- Exclusion zone
- Installation corridor
- EEZ border



Baltic Pipe Danish Baltic

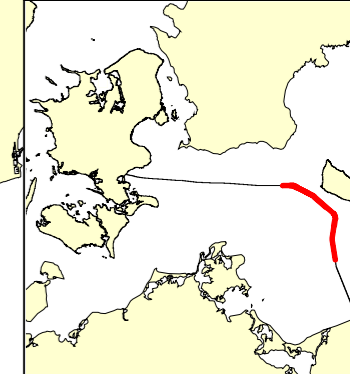
Exclusion zones off Zealand




J.nr.	VIR 2813
Initialer	MHT
System	UTM zone 33 WGS84
Dato	05 11 2019

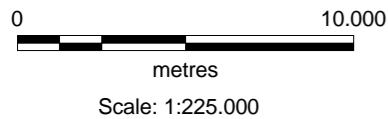
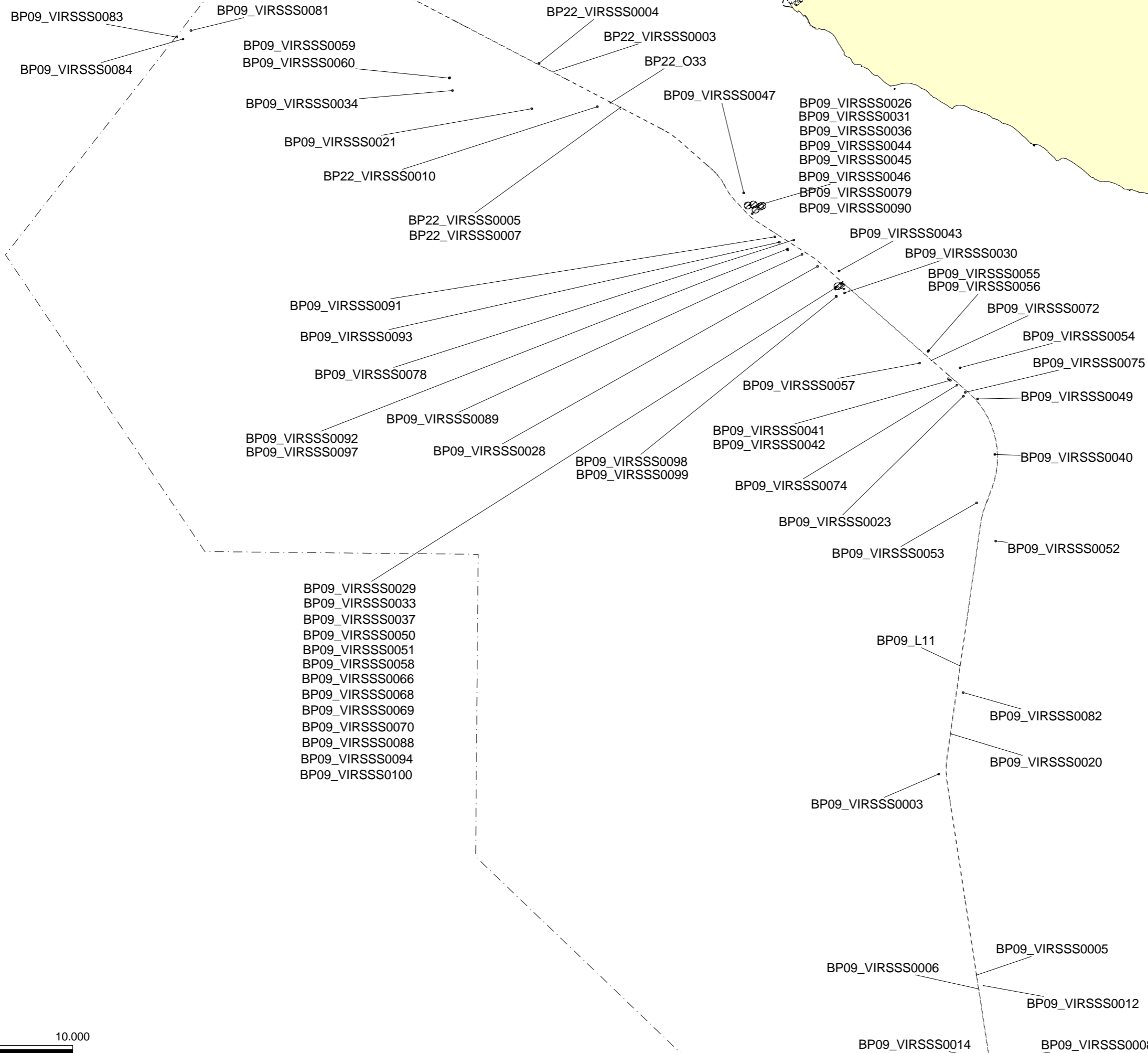


**VIKINGESKIBS
MUSEET**

Vindeboder 12, DK-4000 Roskilde
www.vikingskibsmuseet.dk
 Tlf: +45 46 300 200



-  Exclusion zone
-  Installation corridor
-  EEZ border



Baltic Pipe Danish Baltic

Excl. zones off Bornholm

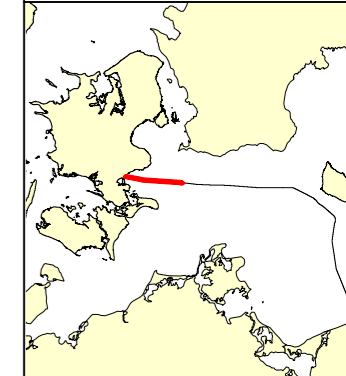
J.nr.	VIR 2813
Initialer	MHT
System	UTM zone 33 WGS84
Dato	07 06 2019



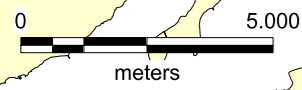
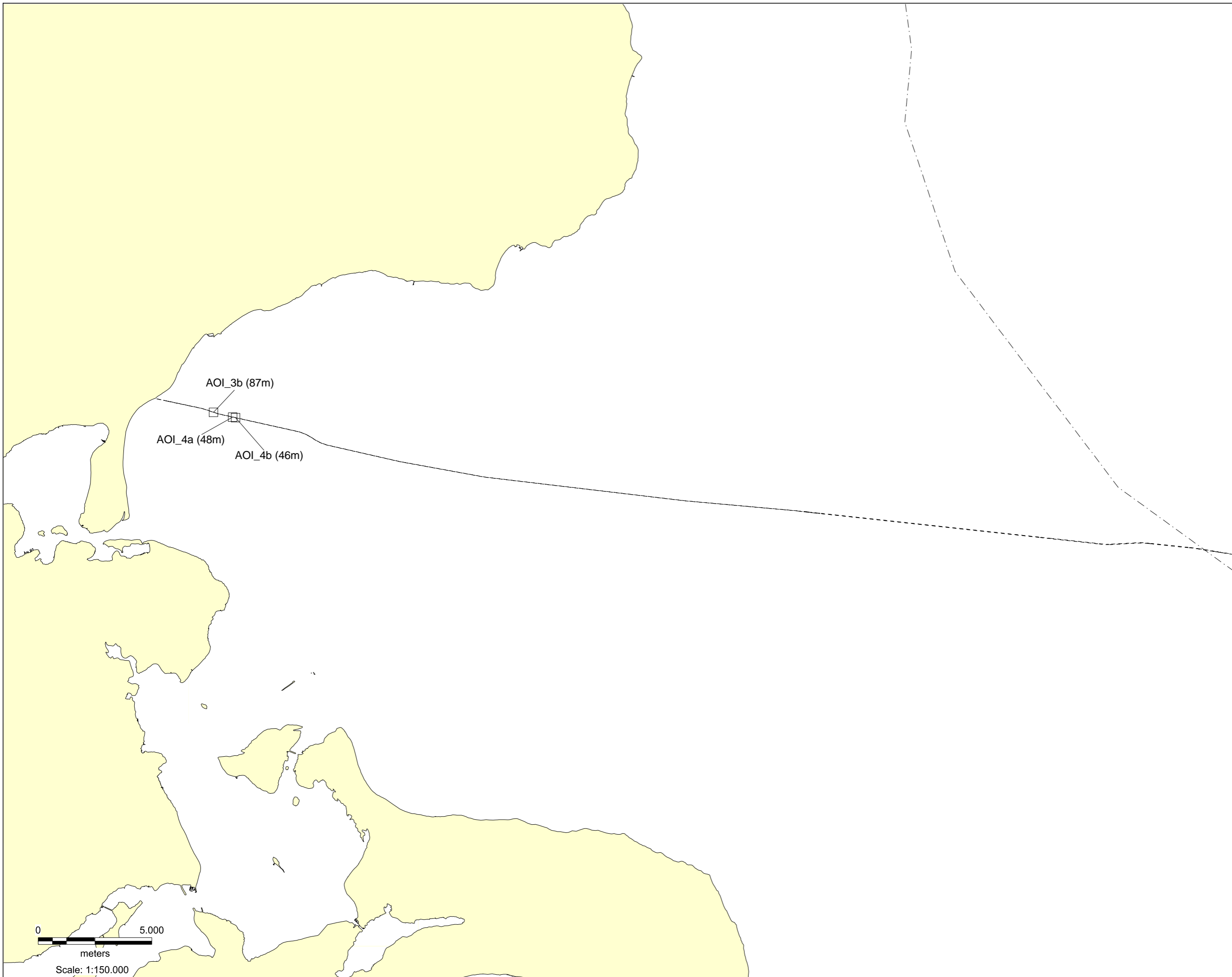
**VIKINGESKIBS
MUSEET**

Vindeboder 12, DK-4000 Roskilde
www.vikingskibsmuseet.dk
Tlf: +45 46 300 200

Appendix 3.3



- Potential site (segment length)
- Installation corridor
- - - EEZ border



Scale: 1:150.000

Baltic Pipe Danish Baltic

Pot. Stone Age off Zealand

J.nr.	VIR 2813
Initialer	MHT
System	UTM zone 33 WGS84
Dato	16 09 2020



Vindeboder 12, DK-4000 Roskilde
www.vikingskibsmuseet.dk
Tlf: +45 46 300 200