

Bornholm 2, East: Extended Archival Control

Marie Jonsson, Viking Ship Museum, 27 March 2022.

Energinet wants to construct two offshore wind farms in the Baltic Sea off the coast of Bornholm and has asked the Viking Ship Museum to prepare this archival inspection of the current project area insofar as cultural-historical interests on the seabed are concerned. These checks only cover offshore wind turbine area 2: the westernmost section (see map, Appendix 1).

The following source groups are used in the archival control:

- *Finds and Ancient Monuments*: national archaeological database
- Danish Maritime Authority's Register of Wrecks
- Previous marine archaeological surveys conducted by the Viking Sea Museum in the area
- The scuba-diving database *The Wreckage Guide*
- Geology Desk Study, offshore Bornholm, Baltic Sea. Windfarm investigations from GEUS.
- *The joint reporting database* from the Agency for Culture and Palaces

Cultural-historical objects:

The representativeness of the registrations in the Finds & Ancient Monuments (Table 1, Appendix 1) is in some cases quite poor, as most finds registered are old observations and evidence, only a few of which are correctly positioned. For the same reason, many of them are technically positioned at so-called 'administrative area points': i.e. they are centroids of Danish Maritime Safety Administration's named sections of Danish territorial waters.

Accordingly, this catalogue containing 13 objects (Wrecks and Registration of Foundering Data) should primarily be regarded seen as proof of the foundering frequency in the area as a whole and not as a reliable mapping of actual wreckage within and outside the construction area, respectively.

In the *Bornholm 2* area no objects have been registered for the administrative area point. The closest area of this type, 401754, is outside the wind farm area.

Two of the wrecks in Finds and Ancient Monuments are estimated to be more than 100 years old:

- 401754-334, ROV investigated and dated to c. 1650–1750
- 401754-339, ROV investigated and dated before 1900

Three vessels have foundered relatively recently and all of them are situated in the northern part of the area:

- 401754-240 (*Lise Espe*), year foundered: 1967
- 401754-247, year foundered: 1940
- 401754-251 (*Micken R 499*), year foundered: 1991

These three are also registered in the Danish Maritime Authority's Register of Wrecks (under ID nos. 80, 2056 and 1562 respectively), and *Micken R 499* is also registered in the Wreckage Guide. 401754-247 is possibly the same as 401754-290 (Wrecks sunk 1940, EFS 396/1940).

Two other objects foundered in the 1900s are:

- 401754-261, submarine, year foundered: 1940–1945

- 401754-262, aircraft, year founded: 1940–1945

The aircraft is also designated in the Wreckage Guide, but its position is uncertain. The Wreckage Guide also includes a coaster, a sailing vessel and an unknown wreck (Appendix 1) in the area. An additional shipwreck is registered in the Danish Maritime Authority's register (see map, Appendix 1).

The joint reporting database of the Agency for Culture and Palaces includes reports from fishermen, etc., and shows the location of potential wrecks, but the positions have not been studied in more detail.

Bornholm 2, East is transected by an installation and anchor corridor used for the gas pipelines Nord Stream, Nord Stream 2 and Baltic Pipe. In this corridor, the Viking Ship Museum has been responsible for geoarchaeological and archaeological studies prior to the installations of the pipelines. In addition to the verified cultural-historical objects registered in the Agency for Culture and Palaces' *Finds and Ancient Monuments* register, there are anomalies which, upon visual inspection, turned out to be scrap or of natural origin. It will be possible to use the information from these surveys in a future geoarchaeological analysis to avoid identifying or investigating something that has already been studied.

Topographic potential for traces of Palaeolithic (Early Stone Age) settlement and activity:

The entire project area is made up of seabed. A possibly flooded terrain Palaeolithic terrain is intact along south-west edge of Rønne Banke, which is the north-eastern edge of the construction area (Jensen, Tésik & Bennike, 2021, p. 29, 58 ff). In a geoarchaeological analysis for Baltic Pipe, several tree trunks and stumps were documented at depths down to 35 metres (Jonsson, 2022, pp. 12ff). The 35-metre-long trunks are not rooted, however, whereas some of the trunks between 21 and 31 metres are. At shallower water levels than today, the shores of the current Rønne Bank were potentially attractive for settlement in a hunter–gatherer economy, even though the area was habitable for only short periods of time. Obviously, these short periods were long enough for forests of large trees to have spread into the area near the coastline, providing the prerequisites for people to have been interested in settling here.

It cannot be ruled out that there are preserved traces of activity from the past in the area, as it was rapidly flooded on two occasions. It is possible to use geophysical and geotechnical methods to determine whether the Palaeolithic (Early Stone Age) terrain is intact, ablated or overlaid with deposits to such an extent that it is not endangered by (all of) the planned construction works and, in so doing, upgrade and elaborate on the well-founded presumption.

Conclusion

- 1) There is a well-founded assumption that archaeological sites, protected by the Danish Museum Act, exist in the project area, it is expected that a preliminary marine archaeological study will be required prior to the initiation of construction in the area.
- 2) A geophysical (and possibly geotechnical) investigation campaign should be carried out as this can form the basis for a geoarchaeological analysis of the area's potential content of ancient monuments, which would be a far more accurate basis for subsequent, preliminary marine archaeological studies than archival information alone. A geophysical/geotechnical study campaign of this nature should be designed in collaboration with the Viking Ship Museum to ensure that the data collected complies with a standard that enables the data to be used in the subsequent archaeological analysis.

English summary

Energinet is planning the construction of two offshore windfarms off the coast of Bornholm in the Baltic Sea. Energinet has requested the Viking Ship Museum in Roskilde to perform an archival screening of the archaeological interests in the area. The screening shows that there are a number of wrecks and records of

ships having foundered in the area (Tables 1 and 2), and, moreover, that there is a potential for Palaeolithic remains in shallower areas. The construction site is transected by the pipeline routes of Baltic Pipe, Nord Stream 1 and

Nord Stream 2, all of which have been investigated by the Viking Ship Museum, the results of which can be used in the forthcoming data screening (see map, Appendix 1).

The Museum proposes that further investigations be conducted.

List of references

- Jensen, J. B., Tésik, L. P., & Bennike, O. 2021 *Geology desk study offshore Bornholm, Baltic Sea. Windfarm investigations*. Copenhagen
- Jonsson, M. (2022). *Baltic Pipe. Screening of geophysical data and target inspections for the proposed Baltic Pipe gas pipeline, anchor corridor, Danish Baltic sector*. Roskilde
- Jonsson, M. 2022 *Nord Stream 2 Pipeline – Anchor corridor. Cultural heritage target assessment and exclusion zone recommendations*. Roskilde
- Thomsen, M.H. 2010: *Nord Stream Pipeline: anchor corridor. Inspection review of survey data and cultural-historical assessment*. Roskilde.
- Thomsen, M.H. 2019a: *North Stream 2 Pipeline: north-western route. Cultural heritage target assessment and exclusion zone recommendations*. Roskilde.
- Thomsen, M.H. 2019b: *Nord Stream 2 Pipeline: south-eastern route. Cultural heritage target assessment and exclusion zone recommendations*. Roskilde.
- Thomsen, M.H. & Cottage, F.D. 2018: *Nord Stream 2 Pipeline. Cultural heritage target assessment and exclusion zone recommendations*. Roskilde.
- Thomsen, M.H. 2020: *Baltic Pipe, Danish Baltic sector: Screening of geophysical data and target inspections*. Roskilde.

Table 1. Objects registered in *Finds and Ancient Monuments* in the Bornholm 2 area.

Place and locality no.	Facility	Event	Protected
401754-240	Motor vessel Call name: LISE ESPE Salvaged: Unknown Home port: Denmark Reinforcement: no Year foundered: 1967	Registration of foundering data, Position uncertain	No
401754-247	Wreck Dated from: 1940 Dated to: 1945 Unknown vessel type Salvaged: Unknown Reinforcement: no Year foundered: 1940	Registration of foundering data Information from wreck book Reg. by fisher at the same position.	No
401754-251	Fishing vessel Call name: MICKEN R 499 Salvaged: Unknown Home port: Denmark Reinforcement: no Year foundered: 1991	Registration of foundering data EFS 1308/1991 Position is approximate Name possibly MICKEN.	No
401754-259	Wreck Dated from: 1661 Dated to: 2009	Registration of foundering data Text: Position and information reg. by fisher. Foundering date unknown.	No
401754-261	Submarine Salvaged: Unknown Home port: Germany Reinforcement: no Dated to 1940–1945	Registration of foundering data Text: Position and information reg. by fisher. Foundering date unknown.	No
401754-262	Aircraft Salvaged: Unknown Reinforcement: no Dated to 1940–1945	Registration of foundering data Text: Position and information reg. by fisher. Foundering date unknown.	No
401754-267	Wreck Undated, unknown vessel type Salvaged: Unknown	Registration of foundering data Text: Position and information reg. by fisher. Foundering date unknown.	No
401754-290	Unknown vessel type Salvaged: Unknown Reinforcement: no Year foundered: 1940	Registration of foundering data Archive: Reports to Mariners File no.: EFS 396/1940 Text: Wreck sunk.	No
401754-334	Wreck Dated from: 1536 Dated to: 1799	Scanning and ROV recording in connection with the Nord Stream Pipeline. Wreck ID = S-DK1-2-36-4472. Interpretation of sonar and video documentation: Wrecks of a two or three-masted clinker-built vessel, perhaps a small craft from the period 1650–1750.	Yes

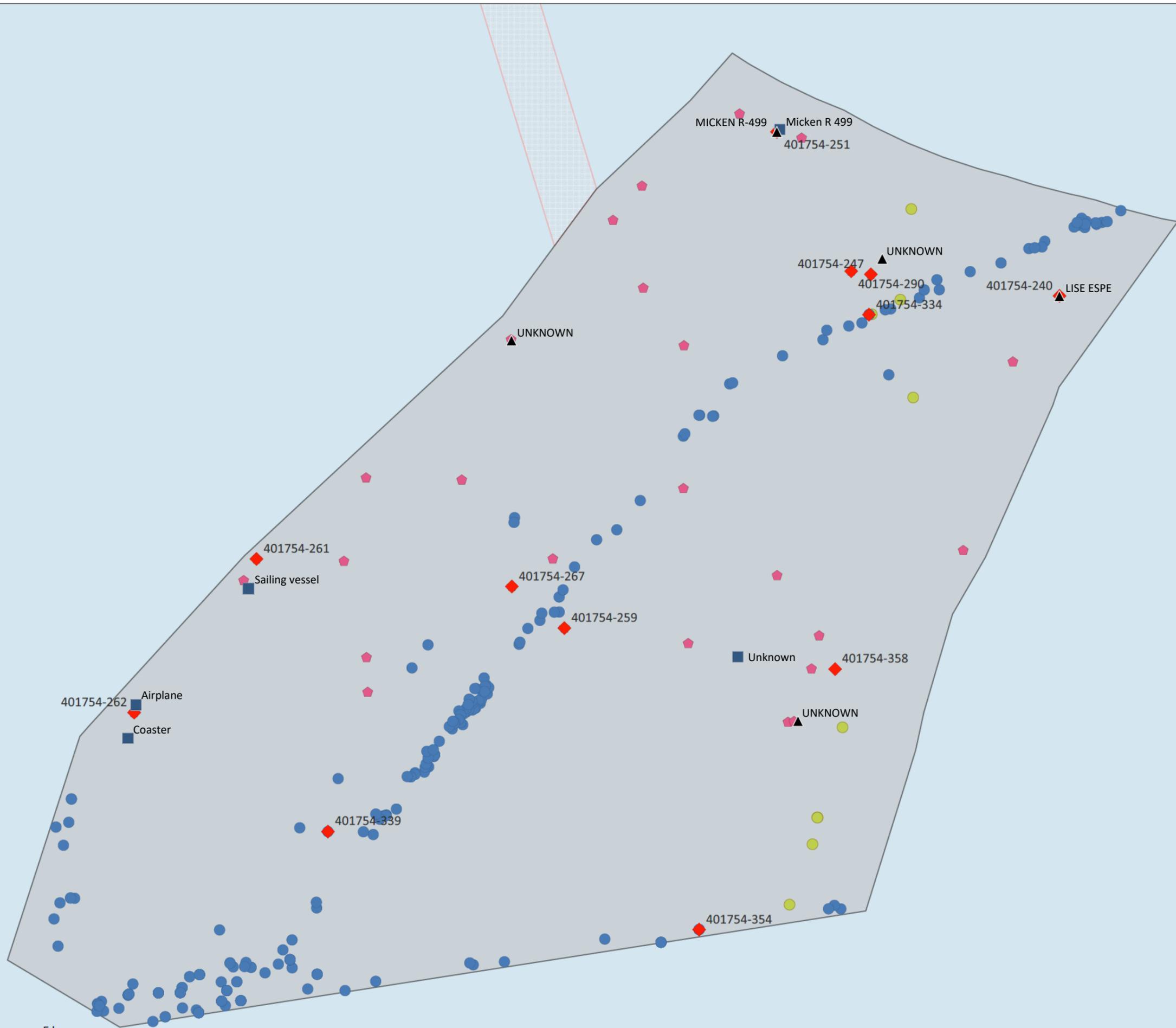
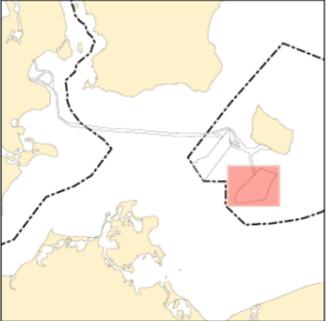
401754-339	Wreck Dated from: 1067 Dated to: 1900 Text: Highly degraded wreck of a wooden ship; apparently without stone ballast. Few pieces of wreckage, both planks and frame timber lying in terrain hollow.	ROV video inspection The anomaly was a 23 x 18 m recess in the seabed in which a few scattered pieces of ship timber were seen rising only 0.15 m above the bottom of the recess. Both planks and frame timber. Highly degraded wreck of a wooden ship; apparently without stone ballast.	Yes
401754-354	Pieces of wreckage Dated from: 1661 Dated to: 2022 Text: Two pieces of wood lashed together with rope	Wreckage identified by ROV investigation of SSS targets. Nord Stream 2 Contact ID SD- DKS37-3786	No
401754-358	Pieces of wreckage Dated from: 1067 Dated to: 2022 Text: Wooden mast from a small partially buried ship, approx. 7 m long.	Tower with two sheave holes identified in sonar and video data from Baltic Pipe (VIR2813; s.d.)	No

Table 2. Objects registered in the Danish Maritime Authority's Register of Wrecks within the Bornholm 2 area.

Object ID	STATUS	NAME	FOUNDERE	OBJECT	CARG	FLAG	DESCRIPTION
2417	Position verified by others	UNKNOW N		VESSEL	Coal		Large old sailing ship loaded with coal; the reporter estimates the period at 1840–
226	Position verified by others	UNKNOW N		AIRCRAFT WRECKAGE			Wreckage from a plane
1562	Reported position	MICKEN R-499	23-11-1990	CUTTER		DENMARK	The position is approximate. Name possibly
2056	Position verified by the Danish Maritime Authority, Royal Danish Navy or other	UNKNOW N		SHIPWRECK S			Wreckage book
80	Uncertain position	LISE ESPE	24-04-1967	MOTOR VESSEL		DENMARK	Position uncertain

Table 3. Overview of registered wrecks within the Bornholm 2 area with coordinates in ETRS89/UTM zone 33N (EPSG 25833)

Source	System no.	Place no.	Locality no.	X	Y
Finds and Ancient Monuments	186823	401754	240	495542,1477	6077479,425
Finds and Ancient Monuments	186845	401754	247	490620,1745	6078042,407
Finds and Ancient Monuments	186856	401754	251	488168,1776	6081757,378
Finds and Ancient Monuments	186896	401754	259	482623,2484	6068820,437
Finds and Ancient Monuments	186913	401754	261	474590,2895	6070624,402
Finds and Ancient Monuments	186914	401754	262	471396,3201	6066620,416
Finds and Ancient Monuments	186922	401754	267	481252,253	6069907,426
Finds and Ancient Monuments	187040	401754	290	490106,1772	6078125,405
Finds and Ancient Monuments	195574	401754	334	490571,1779	6076992,413
Finds and Ancient Monuments	208773	401754	339	476454,7504	6063519,186
Finds and Ancient Monuments	245388	401754	354	486138,7497	6060965,998
Finds and Ancient Monuments	245396	401754	358	489686,6562	6067753,706
Source	OBJECT ID	STATUS	NAME	X	Y
Danish Maritime Authority	2417	Position verified by others	UNKNOWN	488718,514	6066402,83
Danish Maritime Authority	226	Position verified by others	UNKNOWN	481244,1472	6076322,052
Danish Maritime Authority	1562	Reported position	MICKEN R-499	488165,8485	6081758,316
Danish Maritime Authority	2056	Position verified by the Danish Maritime Authority, Royal Danish Navy or other	UNKNOWN	490916,7099	6078451,863
Danish Maritime	80	Uncertain position	LISE ESPE	495539,7	6077479,494
Wreckage Guide		Confirmed position	Coaster	471240,8765	6065951,045
Wreckage Guide		Safe position	Sailing vessel	474379,1517	6069849,115
Wreckage Guide		Uncertain position	Micken R 499	488240,5675	6081820,673
Wreckage Guide		Uncertain position	Airplane	471452,3814	6066817,669
Wreckage Guide		Uncertain position	Unknown	487149,2606	6068069,9



- Sources:
- ▲ Danish Maritime Authority's Register of Wrecks
 - Wreckage Guide
 - ◆ Finds and Ancient Monuments
 - Nord Stream
 - Baltic Pipe
 - ◆ Joint reporting database

Administrative data

- Wind farm
- ▨ Export cable transect

Data supply, WMS
Graphics display card, subdued

Contains data from The Danish Agency for Data Supply and Efficiency

Bornholm 2, East

Objects from the various sources

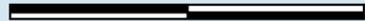
File no.	VIR 2937
Initials	MEJ
System	ETRS89 / UTM zone 33N
Date	05/04/2022



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



0 2,5 5 km



1:100.000