

APPENDIX VI:

The Seaway to the Port of Eemshaven and the Outer Harbour Mooring of Doekegat Rede: an Example of the Work-Through Process of Archaeological Investigations in The Netherlands

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The Monuments Act and the Process of Archaeological Investigations

In The Netherlands, the protection of the cultural heritage is established in the *Monuments Act* of 1988. This law was extended in 2007 with the 'European Agreements of Valetta' and the expansion of the law to the contiguous zone of The Netherlands (24 nautical miles off the coast). The protection or mandatory archaeological assessment is also imbedded in the regulations as the 'Environmental Impact Assessments' (Milieu Effecten Rapport, MER) and the regulations on sand extraction and dredging.

The scheme of archaeological investigations is defined in the 'Quality Standard for the Dutch Archaeology' ('Kwaliteitsnorm voor de Nederlandse Archeology', KNA) which is described on the website of the 'Organisation for Activities Relating to Soil Management' (SIKB³²). Underwater archaeology has its specific standard and processes which are defined in the 'Quality Standard for Water/Sea Bottoms' (KNA waterbodems 3.1).

There are different stages in the archaeological process (Figure 1). Each of these stages are built on the results of the previous investigation and thus refining the archaeological potential of the affected area. It cannot be emphasised enough that in order to conduct a good and thoroughly archaeological investigation, this process should be taken in account as early as possible. Each stage in the archaeological scheme needs time to be carried out and the results worked out. The conclusions and advice of each report will be checked and evaluated by the competent authority and, if needed, the next stage of archaeological investigations will be initiated. The Dutch Cultural Heritage Agency (Rijksdienst voor het Cultureel Erfgoed, RCE) is for many governmental agencies their advisor in terms of cultural heritage and will act as verifying authority.

There are two preliminary phases in the archaeological process:

- desk-based research
- preliminary investigation:
 - above water (mostly geophysical)
 - under water

If the site proves to be of archaeological interest, the next stage will determine the historical and archaeological value of the site:

- archaeological assessment

Depending on the results of the archaeological assessment there are different courses which can be taken. There are three main options:

³² , www.sikb.nl

- *in situ* preservation
- excavation
- extraction

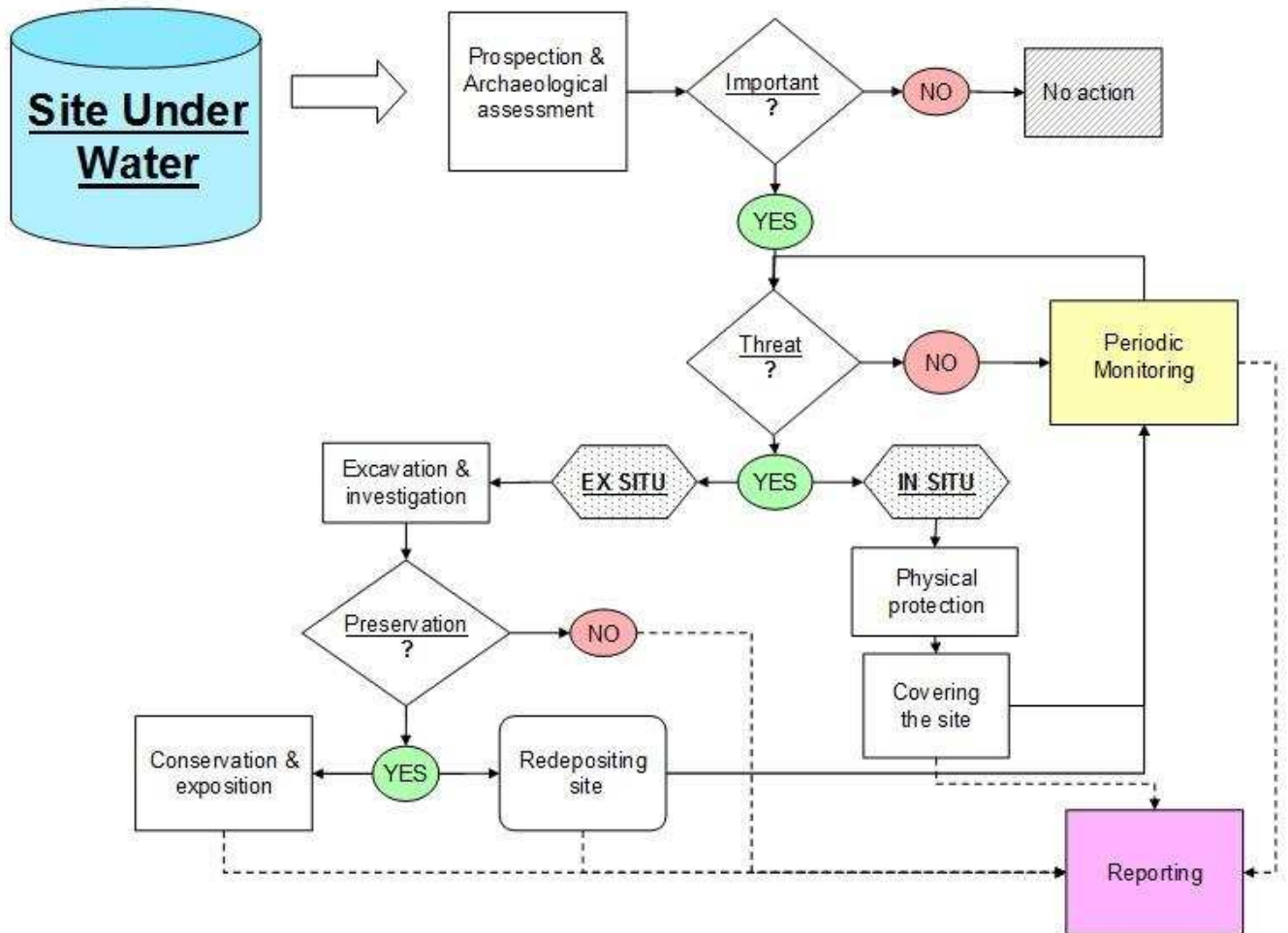


Figure 1: The process of underwater cultural heritage management (RCE, J. Opdebeeck)

There are many different versions in these options. Those versions can be influenced by variables such as time, money, historical importance and many more. As an example: there are different degrees of excavation, the inquiries and the extent of the investigations are put down before the start of the archaeological research in a report on the requirements (Programma van Eisen, PvE).

Depending on the condition and nature of the objects, conservation must also be taken into account: objects which are found in excavations are property of the provinces or, in the case of the North Sea, the Dutch State in general. Before they are handed over, all objects must be stabilised and conserved.

The Extension of the Port of Eemshaven

The extension of the harbour activities in the northern part of The Netherlands included a larger sea way to the port of Eemshaven and the creation of an anchorage outside the harbour.

Desk-Based Research

The first phase in the scheme of archaeological investigations is a desk-based research. In this research all available/known resources are explored to determine the archaeological potential of the area. These archaeological potential includes:

- shipwrecks
- airplanes
- drowned villages
- prehistoric landscapes

The different departments of the Ministry of Infrastructure and Environment (Rijkswaterstaat, RWS), the navy, local historic foundations, amateur archaeologists and local sport divers, all have their own or combined databases with positions of sunken vessels and/or aircrafts. These databases will be combined with other data from archives, old historical maps and possible information from other nearby archaeological investigations in the past.

The prehistoric component will be investigated and evaluated on the basis of the information on the geological layers of the area. In broad terms, these layers are known in summary maps of the region. However, more specific data can be found in the numerous core drillings of sub-bottom data which have been made for scientific or economic research³³.

At the beginning of 2008, an archaeological company was asked to investigate the archaeological potential of the area of the waterway and new anchorage of the port (Figure 2). Their research concluded that there was a high possibility to encounter shipping related objects in the area, with an emphasis on 19th to 20th century shipwrecks. The implementation of the dredging was an imminent danger to any remaining cultural heritage. Their advice was to further investigate the locations by geophysical methods (Periplus Archeomare Report 08_A001).

³³ www.dinoloket.nl

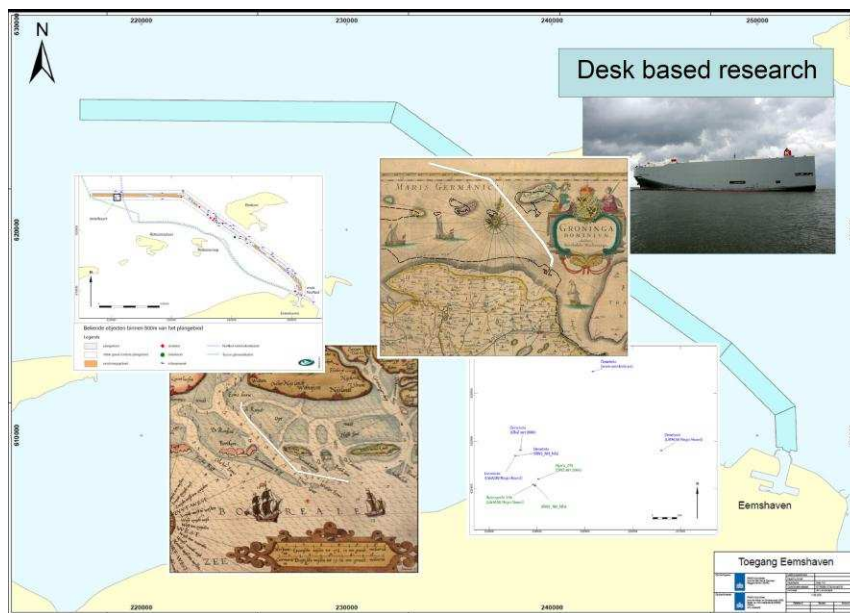


Figure 2: Desk-based research Eemshaven (RWS)

Preliminary Investigation: Above Water

There are a wide variety of (geophysical) research methods which can be used to investigate the sea bottom:

- the surface of the sea bottom can be investigated with sonar, multi-beam and/or video through means of a ROV/ROHP
- magnetic field research can be used to located buried (metal) remains
- other surface penetrating methods are sub-bottom profiler, chirp or boomer: like core drillings these methods can be used to investigate the prehistoric landscape component

Each method, or a combination of methods (depending on the research questions), is used to investigate the presence of potential (historic) sites. Sonar and multi-beam images will show disturbances in the topography of the water/sea bottom, which are referred to as contacts.

By the end of 2008 the sonar inspections (Figure 3) were finished and the recordings yielded 644 contacts of which 92 contacts had possible archaeological expectation (Periplus Archeomare Report 08_A019). The location of the anchorage revealed 150 contacts of which 10 had an archaeological expectation (Periplus Archeomare Report 09_A026).

Following the sonar recordings, the contacts with archaeological expectations were examined with Remote Operated Hoist Platform (ROHP). The ROHP used video imaging and DIDSON (Dual Frequency Identification Sonar) acoustic camera systems. The latter was used because the visibility underwater was best described as 'very bad', in which the normal optic systems didn't provide any decent results.

The operations with the ROHP narrowed the list of possible historical sites down from 92 to 11 in the seaway and from 10 to eight in the anchorage. Those 19 sites were advised to be further examined by diving inspections.

Preliminary investigation: above water

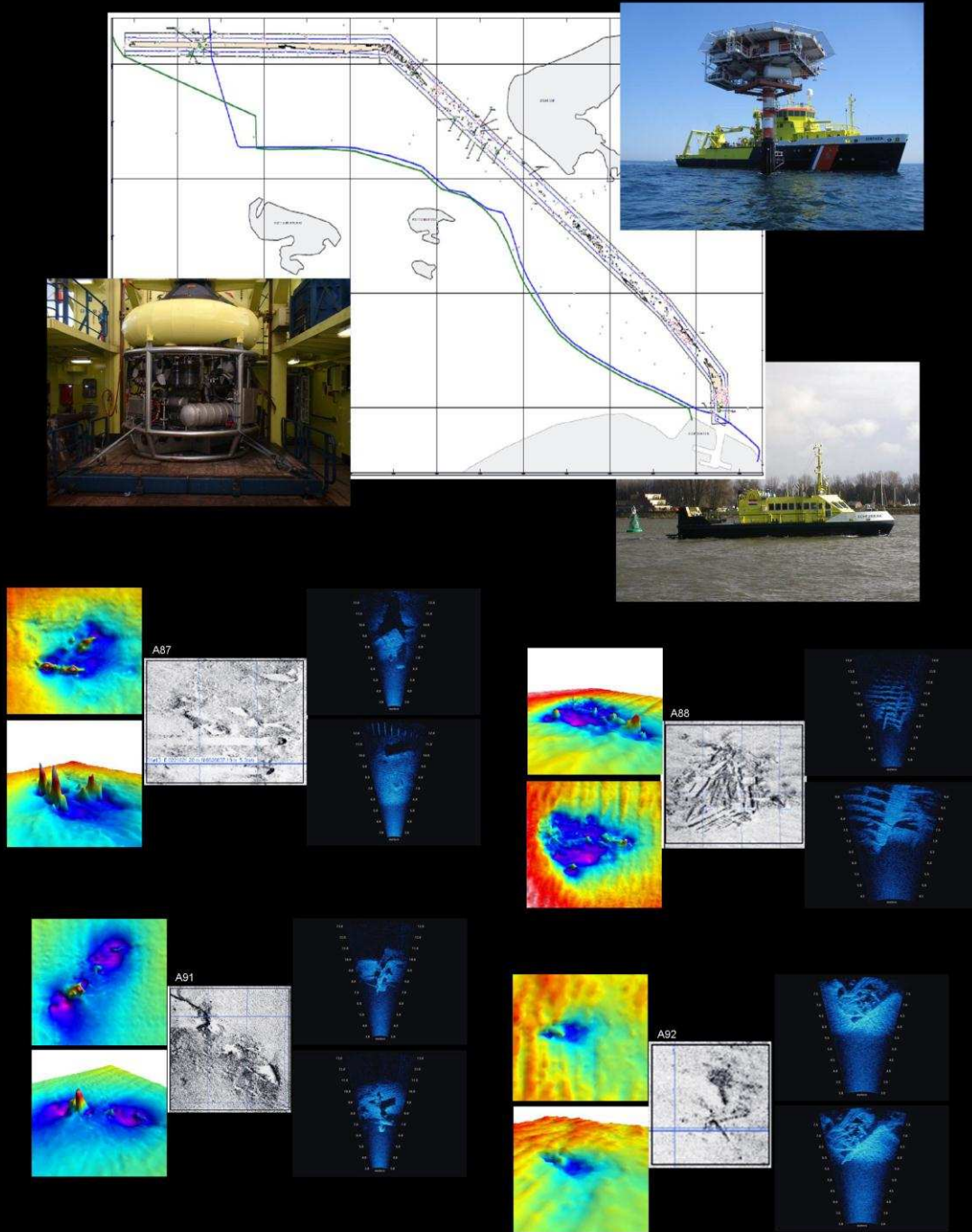


Figure 3: Above water investigation Eemshaven (RWS)

Preliminary Investigation: Under Water

This research phase is developed to determine if certain contacts under water are man-made objects with (possible) historical value, such as shipwrecks. A trained geophysical surveyor will recognise a lot of the objects as natural or man-made through experience by examining the sonar and multi-beam images. However, there are many reasons why an object is not recognised: the settings and speed of recording, depth or just the angle of the object in the seabottom. To establish the true nature of a contact, visual inspection is needed through divers or ROV/ROHP images. The disadvantage of the ROHP is the lack of measurements and also the dependence on the visibility. Opposite to divers, a ROV/ROHP doesn't have arms with sensing motion to recognise certain structural elements.

In 2009, an archaeological company was given the assignment to investigate the site further with divers. From the 11 archaeological interesting contacts which were found in and the around the waterway, seven of them were fairly easy to be labelled as non-historical objects such as anchor buoys, cables, fishing equipment. The remaining four were shipwrecks. The examination of these wrecks proved that they were iron ships from recent times (20th century). Those remains were labelled as low archaeological value. As a result no further investigations were needed. But if the shipwrecks were to be removed, it was to be under archaeological guidance so to extract any further information from the wreck (ADC Report 2023).

Archaeological Assessment

The archaeological assessment follows the positive identification of an historical site. If the site is of conclusive historical importance, the assessment is needed to determine the archaeological value of the object. As an example: if the preliminary investigations have found a wooden sailing ship, the assessment will have to examine the possible age, ship type and construction, the amount of remains preserved, the presence of cargo or other items, the condition of the materials and so on. The results of this investigation will greatly determine the advice of the competent and verifying authority and, thus, the following course of actions.

The underwater investigation in 2010 of the eight sites in the anchorage only gave one positive result, but the shipwreck was clearly a historical shipwreck which needed further investigation. The decision was made to start immediately with an archaeological assessment to determine the historical value of the site (Periplus Archeomare Report 10_A009).

The multi-beam images of the preliminary investigation show a wreck mound of 15 metres long (Figure 4). Next to the mound in a scouring pit, several frames and pieces of the hull were found. Remains of the keel and other structural remains were found. The mound itself was made entirely of the ships cargo: nicely stacked roof tiles. They are an old hollow type of tiles which were used in the beginning of the 18th century. Dendrochronological examination of some structural wood remains, provided a date around 1725.

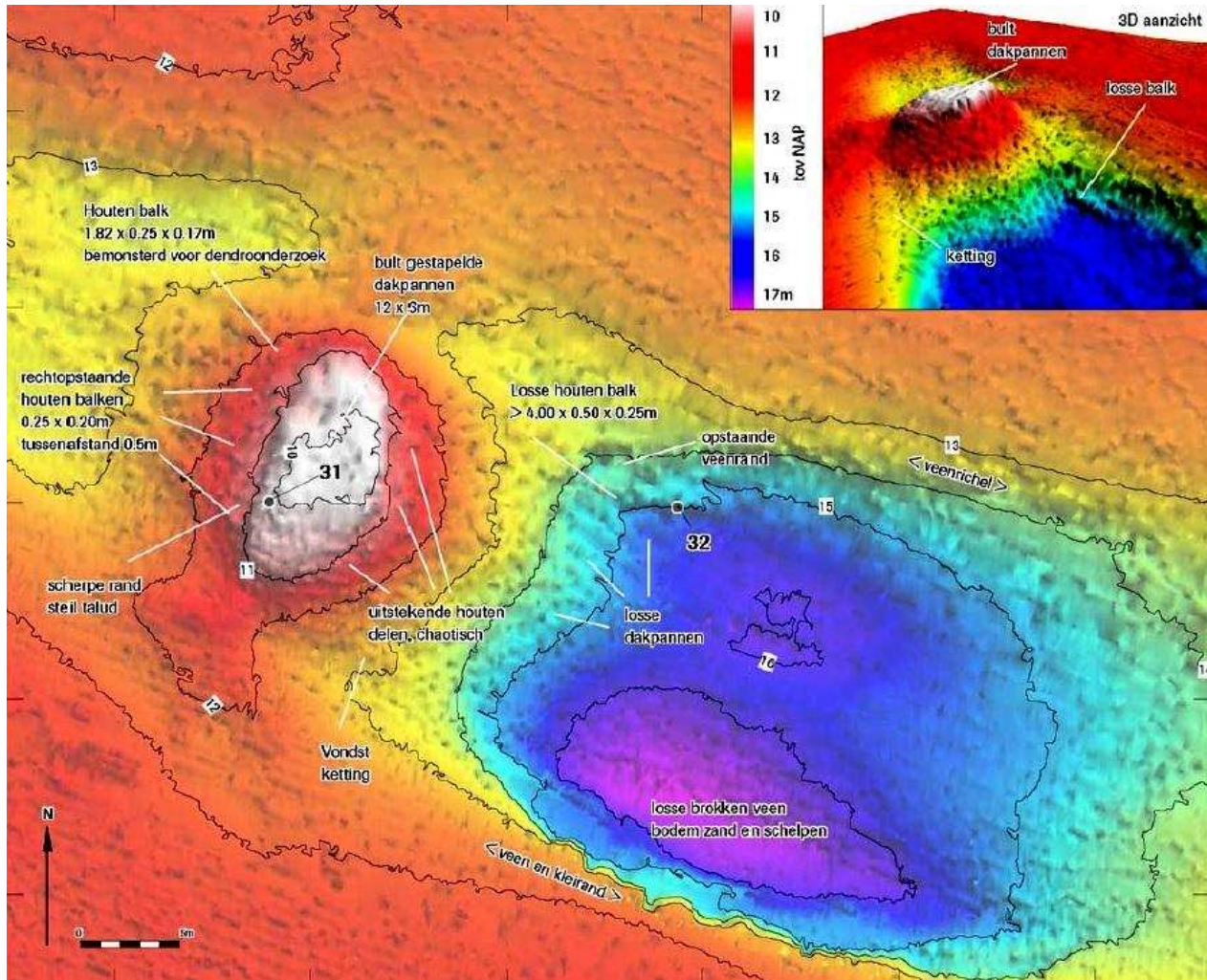


Figure 4: Multi-beam of the historic site (*Periplus Archeomare*)

Solutions

The Anchorage

The location of the historic shipwreck was at the southern edge of the future mooring location. Because the archaeological value of the site was considered high, the probable destruction of this shipwreck would have been preceded by a possible (expensive) under water excavation. The solution was to move the location of the anchorage a few 100 metres to the North. Around (possible) historic monuments, sand extraction or soil disturbance are not allowed in a radius of 100 metres around the site. As a result of the change of planning, the dredging of the anchorage was further then 100 metres from the historic shipwreck and, thus, in no imminent danger. Further actions were not needed. It is, however, preferable to monitor known historic sites in the vicinity of big construction projects.

Seaway to the Port of Eemshaven

In 2010, the departments of the Ministry of Infrastructure and Environment (RWS) decided to extract three iron shipwrecks which were considered a potential danger to the shipping (Figure 5). Following the advice of previous investigations, the removal of the shipwrecks was under the guidance of a (maritime) archaeologist. His job was to collect remaining information, such as objects, measuring interesting construction details and making lots of photographs. From the three wrecks that have been destroyed, two wrecks were identified by the collected data (ADC Report 2495). Wreck A91 was identified as the *Denobola*, a trawler from the beginning of the 20th century which was used in the First World War as a German Marine Patrol boat. She sunk after hitting a mine in 1917. The other wreck, A88, was identified as the 'Anglia', a freighter which sunk in 1903 during a severe storm. The name of wreck A87 could not be discovered. It was a steamship, probably from the end of the 19th to the beginning of the 20th century.

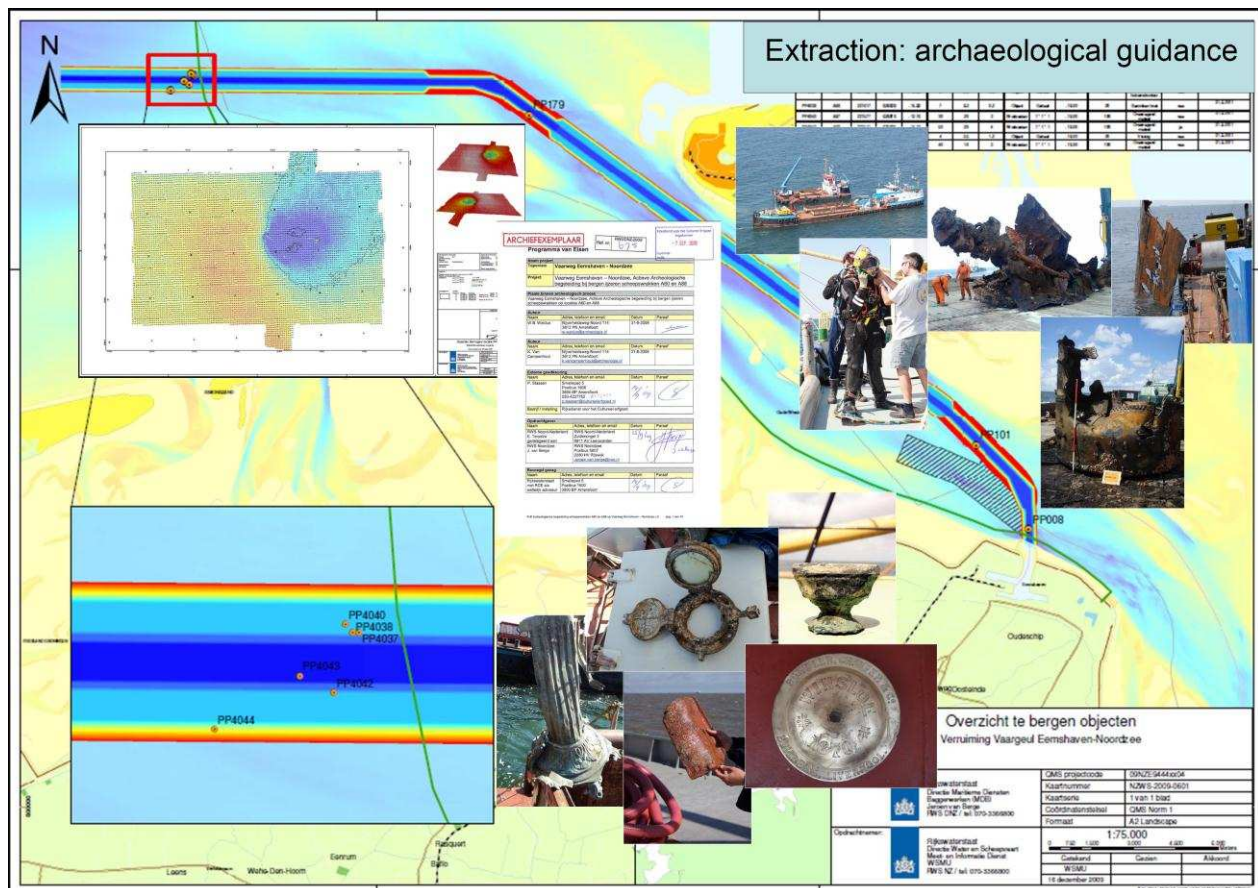


Figure 6: Archaeological guidance Eemshaven (RWS)

Important Notice

All formerly conducted investigations are by no means conclusive. This means that during dredging, sand extraction or other bottom disturbing actions the possibility still exists that new, unknown historic sites can be found. Some sites/objects are completely covered by sediments and the chance of discovering them with non-intrusive methods is very small. The archaeological process prior to big contracting is to minimise the possibility of archaeological unexpected findings

which will slow down the work flow and, thus, cost considerable amounts of money. If unexpected discoveries are made, the Dutch legislation obliges the contractor to stop all works in that area and immediately contact the competent authorities.

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