Review of Data from the Bacton Beach Nourishment Project

Archaeological Assessment

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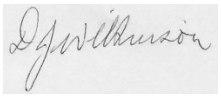
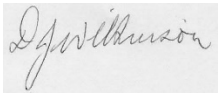
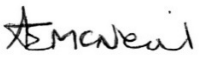
V2	22/04/2020	Draft – with updates from Client	ATH	 DJW
V3	27/04/2020	Final – typos amended - from Client	ATH	 DJW
V4	09/06/2020	Final – comments from Volker Dredging actioned	ATH	 AEM
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Summary

Wessex Archaeology has been commissioned by Hanson Aggregates Marine Ltd. (HAML), on behalf of Anglian Offshore Dredging Association (AODA) to undertake an archaeological assessment of the dredging work undertaken for the Bacton Beach Nourishment project. This follows the discovery of Palaeolithic stone tools by members of the general public on the beach at Walcott, Norfolk where aggregate was deposited for the project. Between 750 and 1000 stone tools, thought to be of Middle Palaeolithic age and consistent with other finds of this type recovered from the Anglian region have been reported so far, along with between 50 and 100 fossils, making this an incredibly significant archaeological discovery.

This archaeological assessment reviewed the locations of the discoveries, chainage report of where aggregate from each licence area was deposited on the beach, and the trackplots of dredging in the East Coast licence areas. As such any conclusions expressed in this report only relate to those portions of the licences used for the Bacton Beach Nourishment Project and further only to those portions of the sub-areas actually dredged.

Based on the assessment, the provenance of the stone tools could not be definitively confirmed, however, it is thought by Wessex Archaeology, based on the artefact typology and the distribution of sedimentary units across the region and the locations used for extraction that they are most likely to be derived from the Unit 3b sediments located within the utilised portions of Licence Area 511, Licence Area 228, or both.

Recommendations forthcoming from the conclusions of this assessment relate to: the future monitoring and data collection at Bacton and Walcott; the ongoing dredging operations in the East Coast dredging region; and to the mitigation, monitoring and management of the archaeological potential associated with future beach replenishment works and will be taken forward in the Paleo-Yare interim report (in press) and any subsequent guidance.

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- Jan Zwart, Van Oord
- Mark Russell, British Marine Aggregate Producers Association (BMAPA);
- Simon Lewis, Professor of Quaternary Science at Queen Mary University of London, and part of the Pathways to Ancient Britain project;
- Robert Davis, British Museum;
- Nick Everington, The Crown Estate;
- Stuart Churchley, Historic England; and
- Victoria Cooper, Royal HaskoningDHV.

This report was researched and compiled by Andrea Hamel. Kitty Foster prepared the illustrations. The project was managed by Euan McNeill.

Review of Data from Bacton Beach Nourishment Project

Archaeological Assessment

1 INTRODUCTION

1.1.1 Wessex Archaeology has been commissioned by Hanson Aggregates Marine Ltd. (HAML), on behalf of Anglian Offshore Dredging Association (AODA) to undertake an archaeological assessment of the dredging work carried out for the Bacton Beach Nourishment project. This work follows the discovery of artefacts of archaeological interest on the beach at Walcott, Norfolk. The aim of the assessment is to determine the provenance of the discoveries (Figure 1).

1.1.2 The Bacton Beach Nourishment project involved the deposition of approximately 1.5 million cubic metres of sand placed and engineered on the beaches in front of Bacton Gas Terminal and the villages of Bacton and Walcott, with the aim of protecting these areas from erosion and flooding (Royal HaskoningDHV 2018; https://www.north-norfolk.gov.uk/sandscaping accessed 24/03/2020). Work was undertaken between July and August 2019.

1.1.3 In July 2019 Wessex Archaeology was commissioned by Van Oord to implement an archaeological protocol for unexpected discoveries and to undertake a series of walkover surveys for the project (Wessex Archaeology 2019a and b). Eight walkover surveys were undertaken in July and August 2019. Overall, 12 finds were recovered: three flints which were later confirmed as natural; a piece of peat possibly from a Pleistocene deposit; and the remaining eight finds were related to maritime activity, Second World War munitions and possible aircraft material.

1.1.4 However, by March 2020, members of the general public walking on the beach had discovered and reported between 750 and 1000 stone artefacts representing an incredibly significant assemblage of Palaeolithic finds, as well as 50 to 100 fossils. These were reported to Jason Gibbons at the Norfolk Historic Environment Record (HER), and the British Museum and Historic England were informed. From the initial assessment of the discoveries, it appears that the majority of the finds so far are likely to be associated and experienced the same timeframes of exposure and post-depositional processes.

1.1.5 It is apparent that the artefacts derived from palaeochannels offshore and were deposited on the beach during the Bacton Beach nourishment project. These artefacts, while not identified during the archaeological survey may have been exposed following deposition by coastal processes such as wave and tide energy, but in any case, their discovery is due to the strong observational skills and dedication of members of the general public who should be commended for their actions in recovering and reporting the finds.

1.1.6 This archaeological assessment has been designed to investigate which licence area the artefacts likely derived from, and to make further recommendations relating to: the future monitoring and data collection at Bacton and Walcott; the ongoing dredging operations in the East Coast dredging region; and to the mitigation, monitoring and management of the archaeological potential associated with future beach replenishment works.

1.2 Project background

1.2.1 In 2008, artefacts were recovered from Licence Area 240, situated approximately 11 km off the coast of Great Yarmouth (Wessex Archaeology 2013). The artefacts included handaxes, flakes and cores, along with faunal remains of bison, horse and reindeer. Further sampling work (funded through the Aggregate Levy Sustainability Fund (ALSF) and English Heritage (now Historic England)) and monitoring of dredged aggregate resulted in the discovery of additional flint artefacts. The interpretation of the geology in Licence Area 240 indicated that the assemblage was most likely recovered from particular floodplain sediments deposited during the early development of the Palaeo-Yare valley. This has been supported by further discoveries of additional Palaeolithic material during additional archaeological monitoring of aggregate areas in the wider region, and from finds reported through the Marine Aggregate Industry Archaeological Protocol.

1.2.2 The majority of discoveries of archaeological interest have been recovered from the Unit 3b sediments, discussed in more detail in Section 4.1.

1.2.3 Due to the archaeological potential of Licence Area 240, there is currently an Archaeological Exclusion Zone (AEZ) covering the area that the artefacts derived from. Although no aggregate was dredged from Licence Area for the Bacton Beach Nourishment project, it is becoming apparent through recent monitoring at Hanson's Dagenham Wharf that finds of archaeological interest are being recovered in a widening spatial extent from the original location.

1.3 Previous impact

1.3.1 There have been previous impacts from dredging within the licence areas, however, the quantity and quality of artefacts being recovered on Bacton Beach suggests that recent dredging has encountered previously undisturbed deposits.

1.4 Scope of document

1.4.1 This archaeological assessment reviews the licence areas that contributed sediment to the Bacton Beach Nourishment project, as well as the discoveries made on the beach since the sediment was deposited.

1.4.2 The original archaeological discoveries from Licence Area 240 were of national significance, and they were found to meet the criteria set out in *Identifying and Protecting Palaeolithic Remains* (English Heritage 1998) in relation to whether Palaeolithic remains have particular importance. Of the 11 types of evidence in the list, the early prehistoric material in the Palaeo-Yare presented four: the high quality of the finds being discovered suggested that they were in an undisturbed, primary context; the remains belong to a period and geographic area where evidence of human presence was particularly rare or was previously unknown; there are well-preserved indicators of the contemporary environment (ie: floral, faunal, sedimentological); and one deposit containing Palaeolithic remains has a clear stratigraphic relationship with another (Fjordr 2016). In addition, Historic England's *Sites of Early Human Activity: Scheduling Selection Guide* (Historic England 2018) notes that the discoveries from Licence Area 240 are comparable to the prehistoric sites of Boxgrove and Happisburgh, where rare *in situ* deposits were discovered, dating to over 800,000 BP (Parfitt 2010, Lewis *et al*. 2019). Therefore, the discoveries at Walcott Beach should be considered within this context.

1.4.3 Evidence from the Palaeo-Yare can contribute to the research questions set out in the following Research Frameworks:

- *Research and Conservation Framework for the British Palaeolithic* English Heritage/Prehistoric Society 2008);
- *North Sea Prehistory Research and Management Framework* (Peeters, Murphy and Flemming 2009); and
- *Research and Archaeology Revisited: a revised framework for the East of England* (East Anglian Archaeology 2011).

1.5 Aims and objectives

1.5.1 The aim of this archaeological assessment is to mitigate the impact of aggregate dredging in East Coast licence areas, by developing a better understanding of the nature of the archaeological resource.

1.5.2 The objectives of this assessment are to:

- Review the locations of the artefacts of archaeological interest on Walcott Beach;
- Assess the chainage report that provides information about where aggregate from each licence area was deposited during the Bacton Beach Nourishment Scheme;
- Review the geology of each licence area that has been determined to be a likely candidate for the artefacts in order to determine whether it is possible to confirm the provenance of the artefacts;
- Based on the findings of the assessment and the issues encountered in making it to recommend future potential amendments to operational best practice and mitigation measures to be considered for future projects of this type in areas of elevated archaeological potential; and
- To prepare a report on the results.

1.6 Copyright

1.6.1 The full copyright of the written/illustrative/digital archive relating to the project will be retained by Wessex Archaeology under the *Copyright, Designs and Patents Act* 1988 with all rights reserved. The client will be licenced to use each report for the purposes that it was produced in relation to the project as described in the specification.

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2 METHODOLOGY

2.1 Study area(s)

2.1.1 There are two distinctive study areas for this assessment:

- The beach where aggregate was deposited, between Bacton and Walcott (Figure 1); and

- The East Coast licence areas that supplied aggregate material for the project (Figures 2-8).

2.2 Archaeological desk-based assessment

Data sources

2.2.1 Data for this assessment were gathered from the following sources:

- A spreadsheet covering over 400 locations of the discoveries on the beach, provided to the British Museum by the Norfolk HER and supplied by Historic England;

- Chainage report from Van Oord regarding where on the beach aggregate was placed, and which marine aggregate licence area it derived from;

- Trackplots from CEMEX, Hanson, Volker and Tarmac indicating the location in each licence area where dredging took place, provided as PDFs;

- Trackplot data of dredging activity from Electronic Monitoring System (EMS) records, provided by The Crown Estate to Historic England;

- The Environmental Impact Assessment undertaken for the Bacton Beach Nourishment project, particularly the Physical Processes chapter; and

- A variety of secondary sources, including data from the Marine Aggregate Industry Archaeological Protocol and operational sampling reports.

Archaeological assessment

2.2.2 Data with positional information were compiled into two project GISs, using ArcGIS 10.6. Data from the beach were compiled in British National Grid, with data from the East Coast dredging licences compiled in WGS 84 UTM31 N.

2.2.3 The ArcGIS was reviewed with regards to the location of the artefacts on the beach, the chainage reports of where aggregate was placed on the beach, and the geology of the licence areas.

2.2.4 Discussions were undertaken with various stakeholders from Historic England, Hanson, Tarmac, Cemex, Volker, BMAPA and Royal HaskoningDHV.

2.3 Assumptions and limitations

2.3.1 The GPS data voluntarily generated by members of the public and subsequently supplied by The British Museum and Historic England includes the reported locations of discoveries of artefacts from the beach. However, these locations are not necessarily the precise location of the discovery, as can be identified through the gridded distribution of finds in Figure 1, suggesting that many of the finds locations are approximate.

2.3.2 It should be noted that the data are recorded with two co-ordinate systems. Findspots with a British National Grid (BNG) co-ordinate with no decimals and no corresponding WGS84 co-ordinate are all positioned on the beach in areas where aggregate from Licence Area 511 was deposited. The findspots with a four to six decimal WGS 84 co-ordinate (which

suggests centimetre to metre accuracy) are distributed across the area, including the point to the furthest south-east, over 750 m beyond the chainage areas. The findspots with a two or three decimal WGS 84 co-ordinate (of metre to kilometre accuracy – and converted into a three decimal BNG co-ordinate) have a gridded layout. There are 13 outliers in the data with WGS 84 co-ordinates: five at one in-land location to the north-west; three to the north (well offshore of the beach); one over 750 m to the south-east; and four well inland at the south (**Figure 1**). Depending on how the reports were made, it is likely that these are due to generalised GPS locations, or it is possible that there could have been errors in recording/typing.

2.3.3 The location of the placement of dredged aggregate on the beach, although captured in detail on the chainage report, include areas of overlap, where aggregate from various licence areas was deposited on the same section of beach.

2.3.4 In addition, between the deposition of aggregate and the discovery of artefacts, there were secondary processes that may have affected the positioning of sediment on the beach. Operational processes such as mechanical movement of the sands by excavators on the beach may have moved sediments and finds beyond the areas delimited by the chainage report. Physical processes, such as waves, tides and storms are also to have affected their locations. Some sediment and finds may also have been moved by visitors to the beach. Given the time elapsed between the deposition of sediment and the discovery of finds of archaeological interest, there is some level of uncertainty about the locations of finds and their relationship to the recorded positions of deposited aggregate.

2.3.5 This report provides a summary of discoveries up to March 2020. Given the wide distribution of finds, it is likely that discoveries continue to be made, however, there may be difficulties in reporting, recording and sharing data due to coronavirus restrictions. In addition, the longer the time scale between the deposition of aggregate on the beach and the discovery of artefacts, the more difficult it would be to assess the provenance of the material, due to natural processes moving aggregate on the beach.

2.3.6 The trackplot PDFs provided by the dredging companies provide the location of the dredgers, however they do not indicate whether the vessel is actively dredging or whether the vessel is transiting. The trackplot data derived from EMS records provided by The Crown Estate do indicate whether the vessel was dredging and cover much more discrete areas within each licence area. Therefore, the trackplot data derived from EMS have been used for this assessment and for the figures. None of the trackplot data provide details about the quantity of cargo that was dredged, and therefore comparisons across areas are generalised.

2.3.7 With regards to an assessment of physical processes, the assessment relied on the data available through the Environmental Impact Assessment (Royal HaskoningDHV 2018), not an assessment of post-depositional data.

3 PHYSICAL PROCESSES

3.1.1 The Environmental Impact Assessment (Royal HaskoningDHV 2018) included an assessment of the physical processes relevant for the Bacton Beach Nourishment project. The area is known to have considerable erosion rates, which was the primary reason for the project.

3.1.2 Modelling indicated that tidal flow rates are sufficient to mobilise and transport large quantities of sea bed sediment in the deeper parts of the nearshore zone, but in shallower

areas, the tidal currents are lower and do not contribute significantly to transport, where the main driver is waves (*ibid*: 87).

3.1.3 Tidal currents on the ebb and flood tide run parallel to the coast, with the potential of moving sediment south-easterly along the beach on the ebb tide and north-westerly along the beach on the flood tide (Royal HaskoningDHV 2018: 88).

3.1.4 Along the north-east Norfolk coast, the net longshore sediment transport is to the south-east driven by the predominant wave climate (Royal HaskoningDHV 2018: 92). Modelling undertaken by HR Wallingford indicated predicted longshore transport rates of 40,000 m^3 / year at Walcott.

3.1.5 However, although the fine grained sediment is likely to be transported down the coast, it was predicted that for relatively coarser-grained sediment (0.9 mm and 1.2 mm), the re-nourished beach would be less dynamic with less change in planform shape (Royal HaskoningDHV 2018: 110). Numerical modelling of longshore sediment transport over a 40 year period indicated that distribution could extend to a maximum of approximately 2 km to the south-east.

3.1.6 It was predicted that if the particle size of the re-nourished beach was coarser than that of the current beaches, then a new slightly steeper beach slope could be introduced, because coarser beach sediments would lead to a steeper profile as the wave conditions were unlikely to change considerably (Royal HaskoningDHV 2018: 117).

4 ARCHAEOLOGICAL ASSESSMENT

4.1 Geological baseline of the East Coast Dredging Region

4.1.1 Following the discovery of artefacts derived from Licence Area 240, a geoarchaeological assessment of the prehistoric character of Licence Area 240 (Hanson Aggregates Marine) was undertaken, which revealed a complex history of deposition and erosion. Eight sediment units were identified, dating from the Late Pliocene/Early Pleistocene to marine deposits associated with the last transgression in the Holocene. The area is dominated by two channel features, one dating to the Late Anglian (c. 430 ka) the other an Early Holocene meandering channel infilled with peats, deposited as late as c.7800 BP. Although two channel features are observed, they are effectively part of the same system, interpreted as the offshore extension of the Palaeo-Yare Valley system.

Table 1 Geoarchaeological interpretation and description

Unit	Interpretation	Age	Description
8	Marine deposits associated with the last transgression in the Holocene	Holocene	Shelly, gravelly medium to coarse sand.
7	Basal fill of a shallow under-filled channel feature (equivocal to onshore lower Breydon Formation)	Early Holocene	Only observed to the northwest of Area 240 and also a small patch in the south western corner. It comprises a basal unit of peat approximately 0.2 m thick overlain by a unit of sandy or shelly clay. Infilling of Channel B.
6	Glaciofluvial alluvium	Possibly mid-Devensian	Sandy gravel.

Unit	Interpretation	Age	Description
5	Possibly represents an estuarine or near coastal depositional environment	Unknown, possibly contemporary with unit 6	Slightly gravelly, slightly silty, fine to medium grained sand infilling depressions.
4	Brown Bank Formation	Early Devensian (110 – 75 ka)	Unit 4 is a very distinctive unit generally associated with the buried channel feature in the north of Area 240 interpreted as the infilling of a cut sequence. It is comprised of fine-grained sediments (sands, silts and clays) deposited in a low-energy environment such as river or estuary.
3b	Reworked glaciofluvial outwash	Wolstonian glaciation (380 to 130 ka)	Unit 3b overlies Unit 3a in the channel and directly overlies Unit 2 throughout the central and western area. It is comprised of sands and gravels.
3a	Reworked glaciofluvial outwash	Wolstonian glaciation (380 to 130 ka)	A channel (Channel A) infill deposit that is associated with a channel feature probably cut into Unit 2 during the Late-Anglian glaciation. Unit 3a is the deepest, and oldest, fill primarily associated with the channel feature in the northeast and comprises gravel and sand.
2a/b	Yarmouth Roads Formation	Cromerian period (478 to 787 ka)	Unit 2a generally comprises silty, gravelly, fine to coarse sands. Observed throughout the majority of Area 240 and generally overlies Unit 1. To the south of Area 240 Unit 2b comprises silty sand with very frequent thin beds and laminae of firm to stiff clay and peaty organic clay.
1	Westkapelle Ground Formation	Pliocene/Early Pleistocene	The deepest unit and is observed across Area 240

4.1.2 The Licence Area 240 assessment indicated that there would be potential in the wider region of aggregate licence areas, particularly where there were remnants of Unit 3b deposits. There was also potential for discoveries of derived artefacts in other sediment units, however, the potential is generally lower.

4.1.3 The work on Licence Area 240 was followed up with an assessment of the wider Palaeo-Yare catchment (Wessex Archaeology 2013), which aimed to delineate and map the regional extents and survival of specific sediment units, and to identify areas of potential in the wider region where Unit 3b was present. It was understood and acknowledged by the aggregate industry and individual companies that that the implications of this distribution could not effectively be carried out on a licence by licence basis, and therefore the project was designed to allow the development of a regional framework which would result in a better understanding of the prehistoric archaeological resource in the region, in terms of its distribution, significance and the mitigation effects from dredging.

4.1.4 Through this work, a number of conclusions were reached regarding the potential for the presence for archaeological material in the wider area, and a set of hypotheses were developed that could be applied to the licence areas in the region to test the key conclusions.

4.1.5 A Written Scheme of Investigation (WSI) (Fjordr 2015) was developed for the early prehistoric material in the Anglian Region, and its implementation is a condition of each of the full-term marine licences issued for aggregate extraction in the Anglian Region from March 2014 onwards. The WSI was developed to record and advance understanding of the significance of early prehistoric material in the region. The core element of the approach is Operational Sampling, where archaeologists periodically assess material recovered from known locations within each aggregate area. The WSI is supported by three sets of documents: area data sheets, which set out the specific palaeogeographic circumstances for each extraction area; licence specific method statements, which set out how the WSI will be implemented on the basis of the specific palaeogeographic circumstances of each area; and wharf method statements setting out how archaeological investigations will be undertaken through Operational Sampling. Appendix 1 of the WSI (Fjordr 2016) was produced to provide more detail about the early prehistoric material in the Norfolk Block of the Anglian Region, reviewed the evidence of the Palaeo-Yare and updated testable hypotheses for archaeological evidence.

4.1.6 Each licence area has a bespoke Palaeo-Yare monitoring method statement, indicating the plans for Operational Sampling. Each method statement indicates the frequency of the Operational Sampling events expected. The datasheets appended to the method statement highlight locations of Unit 3b sediments, where previous dredging has been undertaken, and known findspots in the area. They also include the dredging lanes and their assigned 'Sampling Operation Groups' which correspond to a frequency of sampling in relation to cargoes extracted.

4.1.7 This process is also supported by the ongoing reporting of finds through the Marine Aggregate Industry Protocol for Archaeological Discoveries (BMAPA and English Heritage 2005) and through the discoveries of artefacts during operational sampling visits.

4.2 Discoveries on Bacton Beach

4.2.1 Between 750 and 1000 stone tools have been discovered and reported since the beach nourishment project was completed (S. Churchley, pers. comm. 27/03/2020, R. Davis, pers. comm. 01/04/2020). Between 50 and 100 fossils have also been discovered. Although the locations of the discoveries are somewhat vague (the resolution of the supplied information means that some finds plot some distance from the beach, both on and offshore), they are clustered in an area that extends approximately 2.5 km along the beach at Walcott (Figure 1).

4.2.2 The British Museum has been in touch with a number of collectors. So far, Robert Davis, Project Curator for the Pathways to Ancient Britain Project at the British Museum, has recorded just over 250 of the stone tools from one of the collectors. Of these, 13% are Levallois products, 7% are handaxes, 3% are handaxe thinning flakes, 57% are hard hammer flakes and the remaining 20% could be natural spalls (R. Davis, pers. comm. 01/04/2020). There is also one non-Levallois core. The assemblage is similar to the Area 240 assemblage as the handaxes are generally similar in shape, being cordiform, and the artefacts have been found in a range of conditions, from fresh or slightly abraded (suggesting they have been in a secure deposit) to very abraded (suggesting they may have been exposed on the seafloor before discovery), with varying degrees of patination and staining. The material dates to the early to mid-Palaeolithic. The quantity of artefacts, and the potential for more to be reported, could lead to this being one of the largest Levallois assemblages in the UK.

4.2.3 None of the fossils has been identified as yet, but they will be assessed at the British Museum.

4.3 Chainage reports

4.3.1 The chainage reports from Van Oord indicate the licence areas associated with the deposition of aggregate on the beach (Table 2) (Figure 1). All dredging operations were conducted by Van Oord, under commercial agreements made with the individual licensees.

Table 2 Chainage reports: Location of aggregate deposited on the beach

Start Trip	Start Date	Licence area	Chainage Range
1	12/07/2019	494	2099 - 2100
3	13/07/2019	228	2051 - 2099
4	13/07/2019	494	2008 - 2051
5	14/07/2019	511	1960 - 2008
7	14/07/2019	512	1899 - 1960
9	15/07/2019	212	1827 - 1899
11	16/07/2019	228	1730 - 1827
17	18/07/2019	512	1360 - 1730
27	21/07/2019	494	1168 - 1360
35	24/07/2019	228	1156 - 1168
36	24/07/2019	494	1132 - 1156
38	25/07/2019	228	1120 - 1132
39	26/07/2019	494	1045 - 1120
42	27/07/2019	228	1038 - 1045
43	27/07/2019	494	990 - 1038
44	28/07/2019	512	966 - 990
45	28/07/2019	494	942 - 966
46	28/07/2019	512	846 - 942
49	30/07/2019	494	2184 - 846
58	02/08/2019	212	2184 - 2184
59	02/08/2019	512	2593 - 2184
62	04/08/2019	494	300 - 590
63	04/08/2019	512	2930 - 2593
67	07/08/2019	254	3230 - 2930
70	08/08/2019	228	3326 - 3230
71	08/08/2019	254	3858 - 3326
78	10/08/2019	228	4090 - 3858
81	11/08/2019	513	4234 - 4090
82	12/08/2019	228	4438 - 4234
84	13/08/2019	511	4558 - 4438
85	13/08/2019	228	4706 - 4558
86	13/08/2019	494	4918 – 4706
89	14/08/2019	228	5068 – 4918
90	15/08/2019	511	5842 – 5068
96	18/08/2019	254	5696 – 5842
98	19/08/2019	511	5900 – 5696

4.3.2 The distribution of artefacts superimposed on the data from the chainage reports indicates that there are four main licence areas from which the artefacts likely derived: Area 228, Area 254, Area 494 and Area 511. Each of these will be discussed in more detail below. Whilst it is also possible that artefacts could have been derived from Unit 3b sediments dredged from licences 512 and 513 this is considered unlikely. This is because loads from 512 were deposited at low chainage values (sub 1000) well up the beach and away from the concentrations of finds located and in the case of 513 so little material was actually dredged for the project (1 load deposited at chainage 4232-4090).

4.4 Licence Area 228 (Volker Dredging)

4.4.1 Aggregate from this licence was deposited in eight relatively small sections of the beach frontage (Figure 1), with the two south-eastern-most locations corresponding with locations of discoveries of artefacts on the beach.

4.4.2 Van Oord dredged 19 cargoes of aggregate from Licence Area 228, largely in Unit 3b sediments (Figure 2). Although resources in the western side of the licence have been largely removed, there have been previous archaeological discoveries from this area relating to the Unit 3b sediments. Finds from operational sampling include two flakes that were rolled and patinated, likely exposed on the seabed for some time, and a piece of antler. A single Palaeolithic find has been reported through the Protocol, it comprises a fossilised tooth (DEME_0851). An Operational Sampling Report in April 2014 (Wessex Archaeology 2014) noted that the amount of oversized material was very low, estimated to have been around 20 tonnes, which, when added to further low level results from subsequent sampling led to the conclusion in the *Palaeo-Yare Operational Sampling Interpretative Report* (Wessex Archaeology 2015) that given the low density of material recovered, the intensity of historic dredging and the spread of sampling undertaken to date, further sampling would be unlikely to add significantly to the body of information on the archaeology of the region. However, it should be noted that the dredging undertaken for the Bacton Beach Nourishment project was in the north-eastern part of the licence area, which is in a different location in the licence area than the previous operational sampling work. This north eastern area comprises previously unsampled 3b deposits with historic EMS records suggesting it has been subject to relatively little dredging activity over the last 20 years.

4.4.3 Therefore based on the location of the aggregate on the beach and the presence of Unit 3b in the location that has been dredged, this could be a potential candidate for the provenance of the artefacts.

4.5 Licence Area 254 (Tarmac Marine)

4.5.1 Aggregate from Licence Area 254 was deposited on the beach in three locations (Figure 1). In the area of the beach where the artefacts have been discovered, the aggregate from Licence Area 254 is limited to a single, relatively small location at the south-eastern end of the nourishment project (Figure 1). The aggregate at the south-eastern end overlies a previous deposit of aggregate from Licence Area 511. Some artefact discoveries have been recorded almost 800 m to the south-east beyond where aggregate was placed on the beach. This may indicate a possible south-easterly distribution by wave or tidal action, which could suggest that aggregate from Licence Area 254 deposited in the larger areas to the north-west (chainage 3326-3858) could have drifted. Alternatively, this may simply be a product of the positional accuracy of find reporting discussed under 2.3.1.

4.5.2 However, Van Oord dredged 12 cargoes of aggregate from Licence Area 254, largely from the northern part (Figure 3), within an area of mobile sand, which is considered to be of low archaeological potential as the formation of the post transgressive sand banks has removed any evidence of Unit 3. Dredging targeted Unit 8 deposits, comprising Holocene deposits composed of shelly slightly gravelly sand. There is a local exposure of Unit 2 at the southern end of the dredging, but this would likely only have been a very minor source for some of the sand dredged and pumped ashore. Dredging activity for Tarmac's wharves takes place in the same localities, and the sediment is well understood. An archaeological assessment of the licence area (Marine Space 2018) indicated only limited potential for either *in* situ or secondary context prehistoric archaeological material from the Palaeolithic and Mesolithic periods. Furthermore, the active dredge zone for Licence Area 254, as of 1 September 2019, is limited to the northern part of the licence area, confined to sandy sediments (The

Crown Estate and the Mineral Products Association 2019). The majority of the dredging for the Bacton Beach Nourishment Project took place over 1.5 km to the north of the Unit 3b sediments of archaeological potential, with the closest dredge trackplot still over 730 m to the north, in Unit 2 sediments of Yarmouth Roads Formation, comprising silty fine sand with occasional clay and peat. Previous archaeological discoveries from Licence Area 254 and reported through the Marine Aggregate Industry Archaeological Protocol include a possible deer metatarsus (UMD_0041), a molar of a woolly mammoth (UMD_0045) both of which were positioned based on the centre of the licence area in the absence of a trackplot, but likely derive from the Unit 3b sediments, and an unknown bone (Lafatarm_0478), which was positioned based on the centrepoint of the trackplot, and appeared to derive from the Unit 3b sediments in the southern half of the licence area. No Operational Sampling has been undertaken for Licence Area 254, and it was not included in the Regional WSI.

4.5.3 This area is considered unlikely to be the source of the archaeological artefacts discovered on the beach, because the dredging was undertaken in mobile sand and not from that portion of the licence known to contain Unit 3b. Although it may be possible to discover isolated, derived artefacts in the mobile sands, the quantity and the high quality of the discoveries at Walcott suggest a more concentrated provenance. As such Area 254 is not considered a candidate for the origin of the artefacts.

4.6 Licence Area 494 (Tarmac Marine)

4.6.1 The aggregate from Licence Area 494 was largely deposited on the beach at the north-western part of the project, with a single, relatively small deposit towards the north-western end of the distribution of reported discoveries (Figure 1).

4.6.2 Van Oord dredged 31 cargoes of aggregate from the western part of Licence Area 494 (Figure 4). The sediments (based on the previous Palaeo-Yare geological unit distribution mapping) are limited to Unit 8 Holocene marine deposits composed of shelly gravelly sand, edged by reworked post transgressive banks of sand and gravel, with only local exposures of Unit 2 (Yarmouth Roads Formation comprising silty fine sand with occasional clay and peat). Dredging activity for Tarmac's wharves takes place in the same localities, and the sediment is well understood. Although a Monitoring Method Statement (Wessex Archaeology 2017) was produced for Tarmac in January 2017, no operational sampling has yet been undertaken. Sediment from the area continues to be mostly sand, and even the gravellier samples pass through the 30 mm sieve (A. Bellamy, pers. comm. 03/08/2020), and therefore they are of very low potential for the discovery of *in situ* artefacts. No finds of archaeological interest have ever been reported from this licence area through the Protocol. Therefore, this area is considered to be of very low potential to be the source for the artefacts on the beach.

4.7 Licence Area 511 (CEMEX UK Marine)

4.7.1 The aggregate dredged from Licence Area 511 was deposited in three locations along the beach. The first two cargoes were deposited at the north-western end of the beach (around chainage number 2000 (Figure 1). One cargo was deposited towards the south-eastern end around the chainage number 4500. Then seven cargoes were deposited at the south-eastern end (between chainage numbers 5068-5900. It should be noted that the small section of Area 254 aggregate at the south-eastern end of the beach overlies previously deposited aggregate from Licence Area 511, which was then overlain by a final cargo from Licence Area 511 (Figure 1). The two south-eastern locations are at Walcott and correspond with a concentration of reported artefacts.

4.7.2 Van Oord dredged 20 cargoes from Licence Area 511. The majority of dredging was in the southern part of the licence area, largely targeting Unit 2 (Yarmouth Roads Formation, comprising silty fine sand with occasional clay and peat), however dredging also included areas previously identified as Unit 3b (Figure 5) which is the unit thought to be the source of similar artefacts from licences within the region.

4.7.3 Archaeological discoveries have previously been made in the Unit 3b sediments from this licence area. Operational sampling focussing on aggregate cargoes of Unit 3b sediments have been undertaken for cargoes from the north-western part of the area. Finds have included mammoth teeth, animal bones, various flint tools (including flakes, a hammer, and a possible core). Finds from Licence Area 511 reported through the Protocol include a fragment of tusk (CEMEX_0276) and a deer metatarsus (CEMEX_0281), both discovered from aggregate associated with Unit 3b in the northern half of the area. This licence area was previously part of Licence Areas 319 and 251, and finds reported through the Protocol for Licence Area 319 comprise: a fragment of possible mammoth tusk (CEMEX_0276), and a bone from a large deer (CEMEX_0281); while finds for Licence Area 251 comprise WA 2163 and WA 2164 (animal bone, possible hippopotamus of possible Ipswichian date), a peat sample (CEMEX_0296), an auroch metatarsal (CEMEX_0307), and a mammoth bone (CEMEX_0340). Therefore, this licence area is considered to be a possible candidate for the provenance of the artefacts discovered on Bacton Beach.

5 DISCUSSION

5.1.1 This archaeological assessment reviewed the locations of the discoveries, chainage report of where aggregate from each licence area was deposited on the beach, and the trackplots of dredging in the East Coast licence areas. As such any conclusions and recommendations expressed in this report only relate to those portions of the licences used for the Bacton Beach Nourishment Project and further only to those portions of the sub-areas actually dredged.

5.1.2 Based on the assessment, the provenance of the stone tools could not be definitively confirmed, however, it is thought by Wessex Archaeology, based on the artefact typology and the distribution of sedimentary units across the region and the locations used for extraction that they are most likely to be derived from the Unit 3b sediments of located within the utilised portions of Licence Area 511, Licence Area 228, or both.

5.1.3 This is based on the fact that dredging from both areas took place in Unit 3b sediments, and the overlap of find locations on the beach with the locations where aggregate from these licences was deposited. However, the assessment of the provenance of the artefacts is complicated by the way the aggregate was deposited. There was a layer of aggregate from Licence Area 511 deposited on the beach between chainage numbers 5068 and 5842 on 15 August 2019, and between 5696 and 5900 on 19 August 2019. Between these two events, on 18 August 2019, a cargo from Licence Area 254 was deposited between 5696 and 5842, overlapping the first deposit of aggregate from Licence Area 511 and then being overlaid by the second. Therefore, unless further discoveries can be pin-pointed with even greater accuracy, it may not be possible to determine the exact provenance of material.

5.1.4 Interestingly, both of these licence areas are situated immediately adjacent to Licence Area 240, where the initial discoveries of Palaeolithic tools from the East Coast dredging areas were found, with Licence Area 511 to the south-west and Licence Area 228 to the south (Figures 2 and 5). Reviewing the approximate locations of previously reported finds from Licence Area 240, the trackplots for Licence Area 228 are approximately 2.5 km to the east, and the trackplots for Licence Area 511 approximately 3.5 km to the south. Whichever area

this latest assemblage of finds derives from, combined with the previous discoveries, it highlights the intensive exploitation of this area by hominins during the Palaeolithic for tool manufacture, and possibly other activities such as hunting, gathering and occupation.

5.1.5 Collectors of artefacts have indicated that the best locations for making discoveries are in locations where the sediment on the beach has been cut into steps by wave erosion at the high water mark (**Plate 1 and 2**). Collectors have found artefacts sticking out from the steps. The photographs in **Plate 1** and **2** were taken by Simon Lewis, on the beach, near The Crescent, Walcott. It appears there is a thick lens of gravel, with a thin layer of sand on top. The location of the photographs combined with the chainage reports would suggest the artefacts derived from gravels dredged from Licence Area 511, which were then exposed by wave action along the shore, as the waves are eroding denser beach material.

5.1.6 However, it is impossible at this time to definitively confirm the provenance, due to the wide distribution of find locations of artefacts, and the fact that some of the artefacts have been recovered further to the south-east than the aggregate material was distributed. This either indicates issues with the precision of their reported locations, or that artefacts are being transported down the beach due to regular wave or tidal action, or during storm surges, or again, a combination of both. It is also possible that given the dredging of material from Unit 3b from licences 512 and 513 that some portion of the artefacts may have come from these licences (Figures 6 and 7). However, the location of the deposition of material from Licence Area 512 well up the beach suggests this licence is not a strong candidate. Similarly, whilst the deposition location is appropriate the volume of material from Licence 513 is so proportionately small in comparison with 228 and 511 that it is thought to be unlikely to be the source.

5.1.7 Artefactual material is not deposited evenly within Unit 3b and evidence to date suggests they tend to be in higher concentrations in layers in the lower portion of the unit. The dredging history of the licences over the last 27 years is known via Crown Estate Electronic Monitoring System (EMS) data, and much of the material used for this project was taken from areas relatively lightly dredged during that period but the dredging intensity prior to that is not well understood. Although no artefacts have yet been reported from the north-westerly areas of the beach where aggregate from Licence Area 228 and Licence Area 511 was deposited, it is possible that this is because the top layers of sediment contained fewer artefacts, and that the concentration of sediments of archaeological interest were only accessed towards the end of the dredging activity. It is possible that isolated artefacts could be discovered in these areas as the public continue to explore. It is also possible that isolated discoveries could be made in other locations on the beach where aggregate from Unit 3b was deposited, for example locations related to Licence Area 513/2, located approximately 150 m to the north-west of the most north-westerly reported discovery.

5.1.8 Licence Areas 254 and 494 are considered unlikely to be the sources of the artefacts, as the sediment dredged from these areas did not include Unit 3b. These areas could be potential candidates for any isolated or derived finds, however, the quantity and quality of artefacts discovered at Walcott suggests a more concentrated, *in situ* provenance. The only possibility of the artefacts deriving from these licence areas would be if there is a presence of an unexpected gravel lens within the sandbank and sand deposits.

5.1.9 Licence Area 212 and 512 have been completely ruled out as candidates. Only two cargoes were dredged from Licence Area 212, these were almost entirely derived from Unit 2 sediments of low archaeological potential (Figure 8), and the aggregate was deposited in two small areas towards the north-western end of the beach, over 2 km from the north-westerly most artefact discovery. Even though dredging in Licence Area 512 collected

aggregate from Unit 3b sediments, the aggregate was deposited on the beach over 1.5 km from the nearest findspot.

5.1.10 In the long term, there could be issues with regards to the predicted 2 km drift of sediment to the south-east over the next 40 years. This could make it difficult to develop an understanding of the provenance of material discovered in the future further down the coast. But more importantly, the material could contaminate other sites, such as the internationally renowned archaeological site at Happisburgh, where the oldest evidence for hominins in Britain has been discovered, comprising flint tools and fossilized footprints dating back over 800,000 years. Happisburgh lies only 2.5 km to the south-east and could be impacted with artefacts and sediment dredged from East Coast licence areas if the drift of sediment exceeds the predicted rates.

6 RECOMMENDATIONS

6.1 Introduction

6.1.1 This archaeological assessment reviewed the locations of the discoveries, chainage report of where aggregate from each licence area was deposited on the beach, and the trackplots of dredging in the East Coast licence areas. As such any conclusions expressed in this report only relate to those portions of the licences used for the Bacton Beach Nourishment project and further only to those portions of the sub-areas dredged. The recommendations in this report apply to three different areas related to: the ongoing management of the archaeological finds at Bacton; the ongoing management of the archaeological potential of the East Coast dredging region; and the mitigation and monitoring of beach nourishment projects.

6.2 Recommendations related to the ongoing management of archaeological finds at Bacton

6.2.1 For the ongoing management of archaeological finds at Bacton and Walcott, the key recommendation is that the members of the public who have been doing such a fantastic job of discovering artefacts and reporting them, should continue to be encouraged and supported. Their enthusiasm and knowledge as well as their availability, proximity and understanding of local conditions ensures that they are in the prime location for discovery, and their ongoing dedication will ensure that any further discoveries are reported and recorded.

6.2.2 The second recommendation is linked to the first, and any artefacts recovered by members of the public and reported to the Norfolk HER, through the Portable Antiquities Scheme (PAS), Marine Antiquities Scheme (MAS), to the British Museum or to Historic England should continue to be archaeologically assessed by experts, such as those at the British Museum, to ensure that as much information as possible can be derived from these discoveries. Further research may provide more details as to the provenance of the artefacts and could help us to understand more about how people in the past were utilising these resources and living in their environment. It is essential that knowledge gained is then widely distributed, for example: reported to the HER or National Record for the Historic Environment (NRHE); published in appropriate journals; made available online; or as part of a museum exhibition.

6.2.3 Due to the sheer number and significance of the lithics discovered at Walcott, and the potential faunal assemblage, as well as the age and spatial relationship to previous regional finds, Historic England has indicated that expert interpretation, analysis and publication is

required. In doing so, this will appropriately document the artefacts which will at some stage need to feed into the wider on-going regional interpretative study.

6.3 Recommendations related to the ongoing management of the archaeological potential of the East Coast dredging regions

6.3.1 This recommendation concerns Licence Area 228 and Licence Area 511, in line with the recommendations for Operational Sampling outlined in the WSI (Fjordr 2016). Either of these areas, or a combination of the two, could be the provenance for the artefacts. Given the intensity of dredging in relatively localised dredge lanes, the dredging may have passed through a discreet stratigraphy in which the lithics resided, and therefore may have cleared out the material. However, the dredging may have extracted both a surface (2D) and depth (3D) fraction of what is there, and there could be associated material remains still present. Therefore it is recommended that operational sampling visits at wharves receiving unscreened cargoes, or "screened stone" cargoes (where gravel is retained), from these areas are undertaken, particularly when aggregate has been dredged from locations covered by, or immediately adjacent to locations dredged for the Bacton Beach Nourishment project. To be appropriate for monitoring cargoes need to contain the gravel and oversize fraction. This will establish whether any artefacts remain and may be able to confirm the source. This will ensure that any further discoveries are identified as soon as possible, and that information from these discoveries can in turn be shared more widely.

6.3.2 A key consideration for future monitoring, however, is that the particular locations that were chosen for the Bacton Beach Nourishment Project dredging are not currently dredged for commercial purposes, so may not be dredged again for some time. However, the archaeological potential of these locations has been noted, and will be kept by the Licensee, to ensure that when dredging does take place in these locations, the appropriate mitigation can be implemented.

6.3.3 Additionally, operational sampling should continue for any of the East Coast licence areas receiving aggregate dredged from Unit 3b.

6.4 Recommendations related to the mitigation and monitoring of beach nourishment projects

6.4.1 Just as the assessment of evidence from Licence Area 240 highlighted the potential for the wider region, and the understanding that the best approach would not be licence by licence but regional, the significance of the discoveries resulting from the Bacton Beach Nourishment project have highlighted the need for mitigation and monitoring of not just this scheme or the specific licence areas involved, but for all future beach nourishment projects.

6.4.2 When the WSI (Fjordr 2016) was developed, it made provision for the archaeological assessment of material as it is processed at the wharf. However, for beach nourishment projects, the aggregate is not processed at a wharf, but rather distributed directly on the beach. This removes the possibility of archaeological operational sampling at the wharf, but can provide the opportunity to review a far larger quantity of material as it is deposited on the beach. However, as the artefacts at Walcott have demonstrated, the material of archaeological interest is not always immediately apparent, and may only be revealed some time after deposition, and therefore there may need to be a longer time scale built in for mitigation works. Additionally, this process has numerous stakeholders, and needs to be managed in a way to ensure that mitigation and monitoring strategies can be effective.

6.4.3 Therefore, it is recommended that archaeological guidance for beach nourishment schemes should be developed, through discussions with various stakeholders in the Marine

Management Organisation, The Crown Estate, the British Marine Aggregate Producers Association, aggregate and dredging companies and heritage organisations. The guidance would follow on from the framework already established for the East Coast region, through the technical report (Wessex Archaeology 2013) and the WSI (Fjordr 2016), and would build a new framework, to clearly identify who should be responsible for mitigating and monitoring the offshore and the onshore components of these projects.

6.4.4 The guidance could use the discoveries at Walcott, as well as the ones from Holland-on-Sea, which have been assessed by Rachel Bynoe, from the University of Southampton (https://www.halsteadgazette.co.uk/news/north_essex_news/17806830.mammoth-discoveries-putting-us-historical-map/ accessed 3/04/2020), as case studies. The discoveries from both Walcott and Holland-on-Sea highlight the need for a more co-ordinated approach for further schemes, and for further involvement with heritage stakeholders. Robert Davis from the British Museum and Stuart Churchley from Historic England have both indicated that they would be keen to contribute to the guidance.

6.4.5 In addition, the guidance would establish the importance of archaeologists for future beach replenishment schemes working more directly with locals, heritage and archaeological societies and groups to encourage them to be actively vigilant in areas with newly deposited sediments. Archaeologists could also facilitate the uptake of reporting mechanisms such as the PAS or the MAS, through presentations, workshops and other means, to encourage reporting, which will result in information from the discoveries being available to a wider audience.

REFERENCES

Bibliography

English Heritage 1998 *Identifying and Protecting Palaeolithic Remains*.

English Heritage and the Prehistoric Society 2008 *Research and Conservation Framework for the British Palaeolithic.*

Fjordr 2015 *Written Scheme of Investigations Early Prehistoric Material in the Anglian Region*. Ver. 181215.

Fjordr 2016 *Written Scheme of Investigations Early Prehistoric Material in the Norfolk Block of the Anglian Region: Appendix 1*. Ver. 031016.

Historic England 2018 *Sites of Early Human Activity: Scheduling Selection Guide.*

Lewis, S.G., Ashton, N., Field, M.H., Hoare, P.G., Kamermans, H., Knul, M., Mücher, H.J., Parfitt, S.A., Roebroeks, W., and Sier, M.J. 2019 'Human occupation of northern Europe in MIS 13: Happisburgh Site 1 (Norfolk, UK) and its European Context. *Quaternary Science Reviews*. Volume 211. Pg. 34-58.

Marine Space 2018 *Licence Area 254 Archaeology Desk Based Assessment*. Ref: J/1/12/17. Date: 28/03/2018.

Parfitt, S.A., Aston, N.M., Lewis, S.G., Abel, R.L., Cooper, G.R., Field, M.H., Gale, R., Hoare, P.G., Larkin, N.R., Lewis, M.D., Karloukovski, V., Maher, B.A., Peglar, S.M., Preece, R.C., Whittaker, J.E. and Stringer, C.B. 'Early Pleistocene human occupation at the edge of the boreal zone in northwest Europe. *Nature* Volume 466. 2010. Pg. 229-233.

Peeters, H., Murphy, P. and Flemming, N., (eds.) *North Sea Prehistory Research and Management Framework* 2009.

Royal HaskoningDHV 2018 *Bacton to Walcott Coastal Management Scheme: Environmental Statement*. Reference I&BPB5925R001F0.1.

The Crown Estate and the Mineral Products Association 2019 *Active Dredge Zones for the East Coast Region*. Issue 34. Correct as of 01/09/2019.

The Prehistoric Society and English Heritage 2008 *Research and Conservation Framework for the British Palaeolithic*

Wessex Archaeology 2013 *Palaeo-Yare Catchment Assessment: Technical Report*. Internal reference 83740.04.

Wessex Archaeology 2014 *Licence Area 228: Archaeological mitigation: Cliffe Wharf Operational Sampling*. Internal Reference 88330.06.

Wessex Archaeology 2015 *Palaeo-Yare Operational Sampling conducted under the short-term licencing provisional Written Scheme of Investigation*. Internal Reference 83742.01.

Wessex Archaeology 2016 *Marine Licence L/2014/00028 (Areas 511, 512, 513/1 and 513/2): PalaeoYare Monitoring Method Statements:* Version 88251.2 30/08/16 for CEMEX by Wessex Archaeology.

Wessex Archaeology 2017 *Licence Area 494: Monitoring Method Statement*. Version 88270.07 17/01/17 for Tarmac by Wessex Archaeology Ltd.

Wessex Archaeology 2019a *Bacton Beach Nourishment, Norfolk: Heritage Method Statement for Archaeological Protocol and Walkover Survey*. Internal reference 223720.01.

Wessex Archaeology 2019b *Bacton Beach Nourishment, Norfolk: Results of Walkover Survey and Archaeological Protocol Reporting*. Internal reference 223720.02.

Websites

Bacton to Walcott Coastal Management: https://www.north-norfolk.gov.uk/sandscaping accessed 24/03/2020

Halstead Gazette: https://www.halsteadgazette.co.uk/news/north_essex_news/17806830.mammoth-discoveries-putting-us-historical-map/ accessed 03/04/2020)

APPENDICES

Appendix 1: OASIS record form

Project Details:

Project name	Review of Data from the Bacton Beach Nourishment Project: Archaeological Assessment		
Project code	226020		
OASIS ID			
Type of project	Desk-based assessment		
Project description	Wessex Archaeology undertook an archaeological assessment of the dredging work undertaken for the Bacton Beach Nourishment project. This follows the discovery of over 1000 Palaeolithic stone tools by members of the general public on the beach at Walcott, where aggregate was deposited for the project. The assessment comprised two study areas – the beach between Bacton and Walcott where the aggregate was deposited, and the East Coast aggregate areas where material for the project was dredged. Based on the assessment, the provenance of the stone tools could not be definitively confirmed, however they are most likely to be derived from the Licence Area 511 or possibly Licence Area 228 or both.		
Project dates	Start: 01/03/2020	End: 13/08/2020	
Previous work	Yes		
Future work	Yes		
Site status	N/A		
Land use	Coastland 1 – Marine Coastland 2 – Inter tidal		
Monument type	Palaeolithic stone tools	**Period**	Palaeolithic

Project Location:

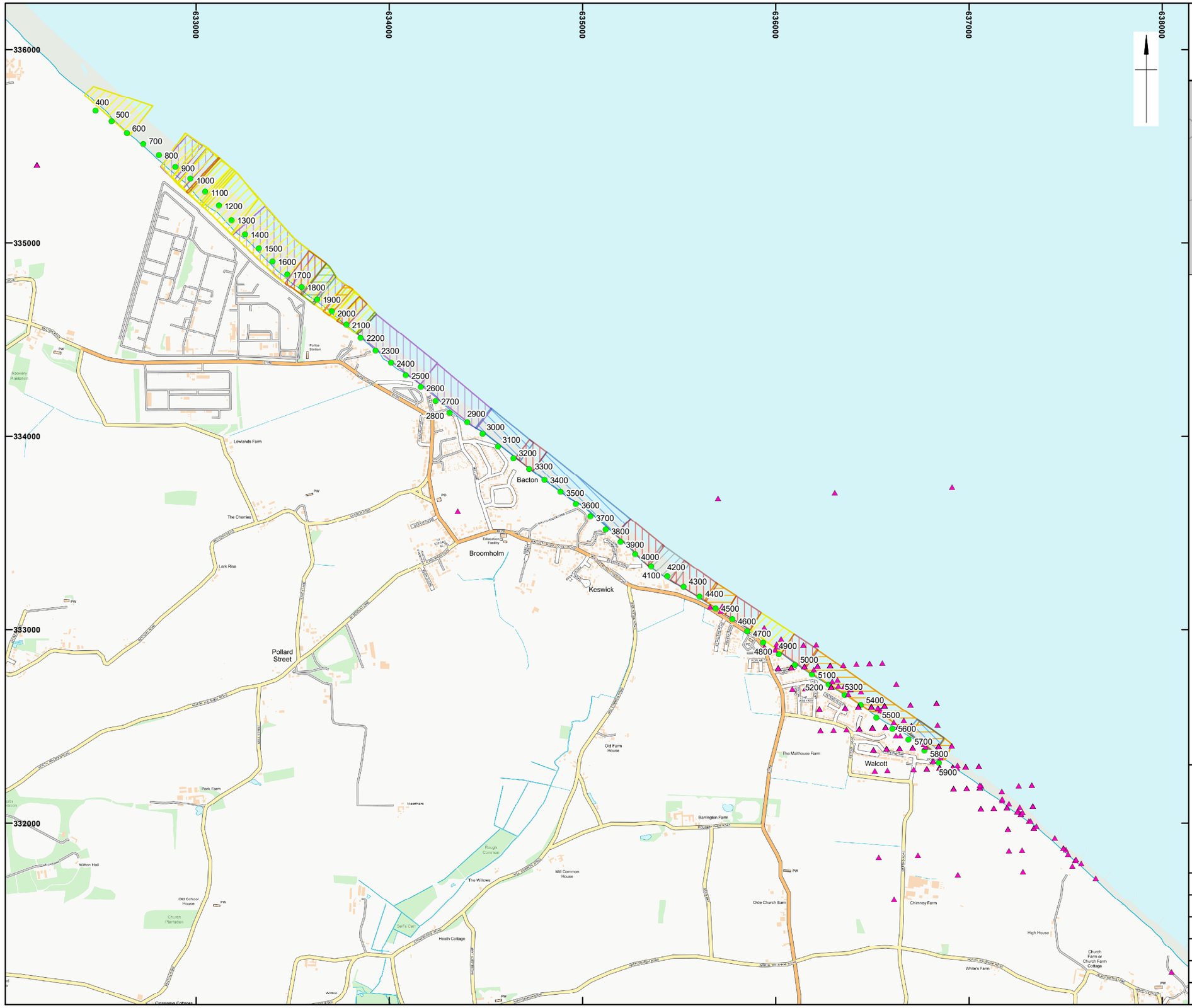
County	Norfolk	**District**	Marine	**Parish**	Marine
Site name	Review of data from the Bacton Beach Nourishment Project: Archaeological Assessment				
Study area (m²)	0				
Site co-ordinates					

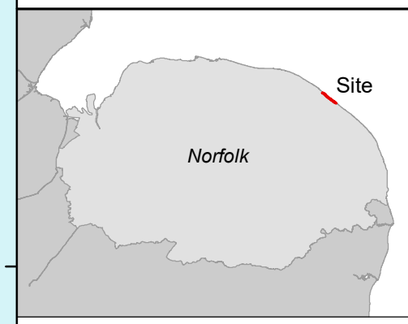
Project Creators:

Name of organisation	Wessex Archaeology		
Project brief originator	BMAPA	**Project design originator**	Wessex Archaeology
Project manager	Euan McNeill	**Project supervisor**	Andrea Hamel

Project Archive and Bibliography:

Physical archive	N/A	**Digital archive**		**Paper archive**	
Report title	Review of Data from the Bacton Beach Nourishment project			**Year**	2020
Author	Wessex Archaeology	**Place of issue**	Salisbury	**Report ref.**	**226020.01**





- Location of artefacts
- Deposition locations
- Licence Area 212
- Licence Area 228
- Licence Area 254
- Licence Area 494
- Licence Area 511
- Licence Area 512
- Licence Area 513

0 500 m

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OSGB36 (OSTN15/OSGM15)

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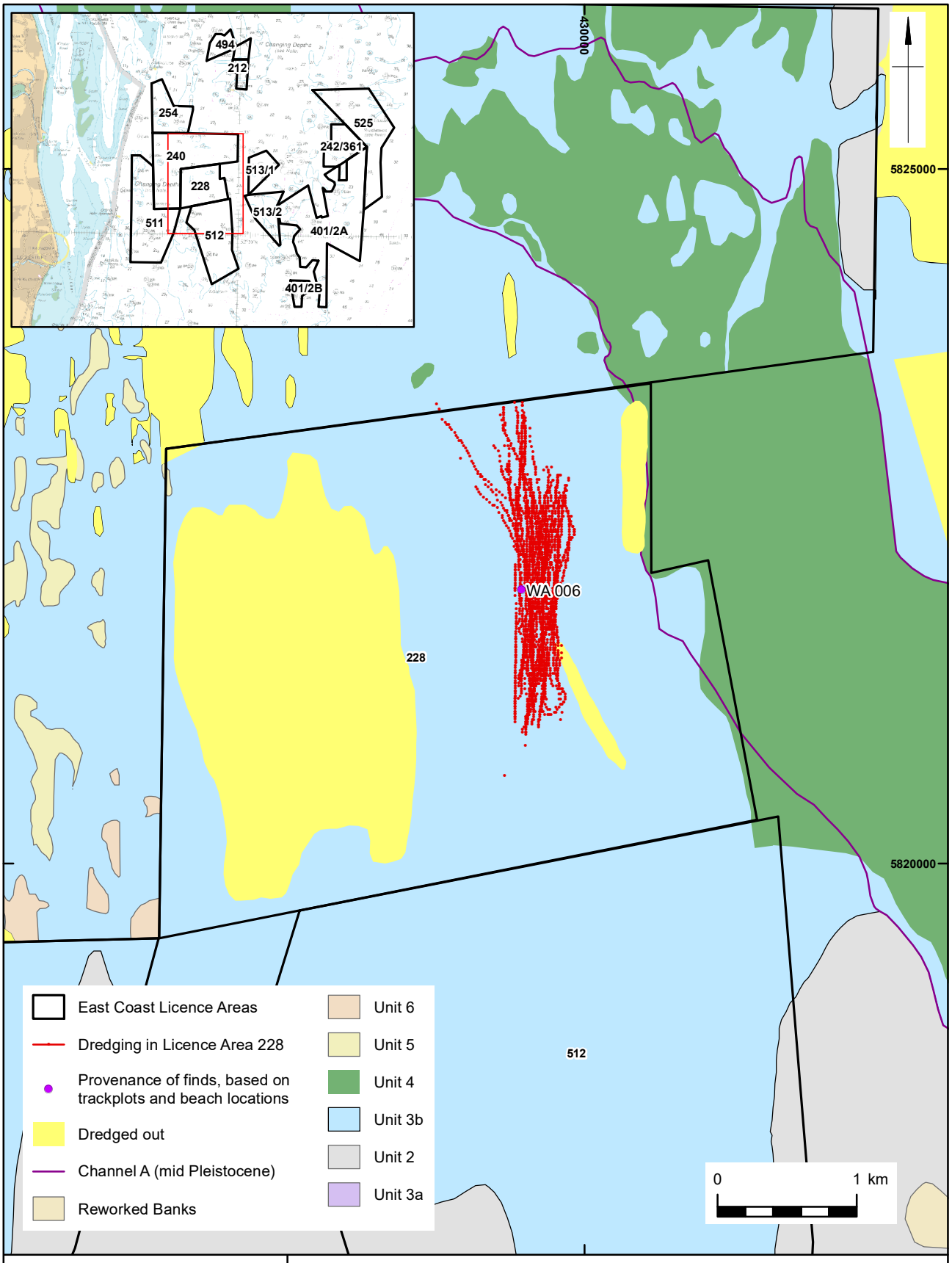
Location of Bacton Beach Nourishment scheme and chainage areas

Figure 1



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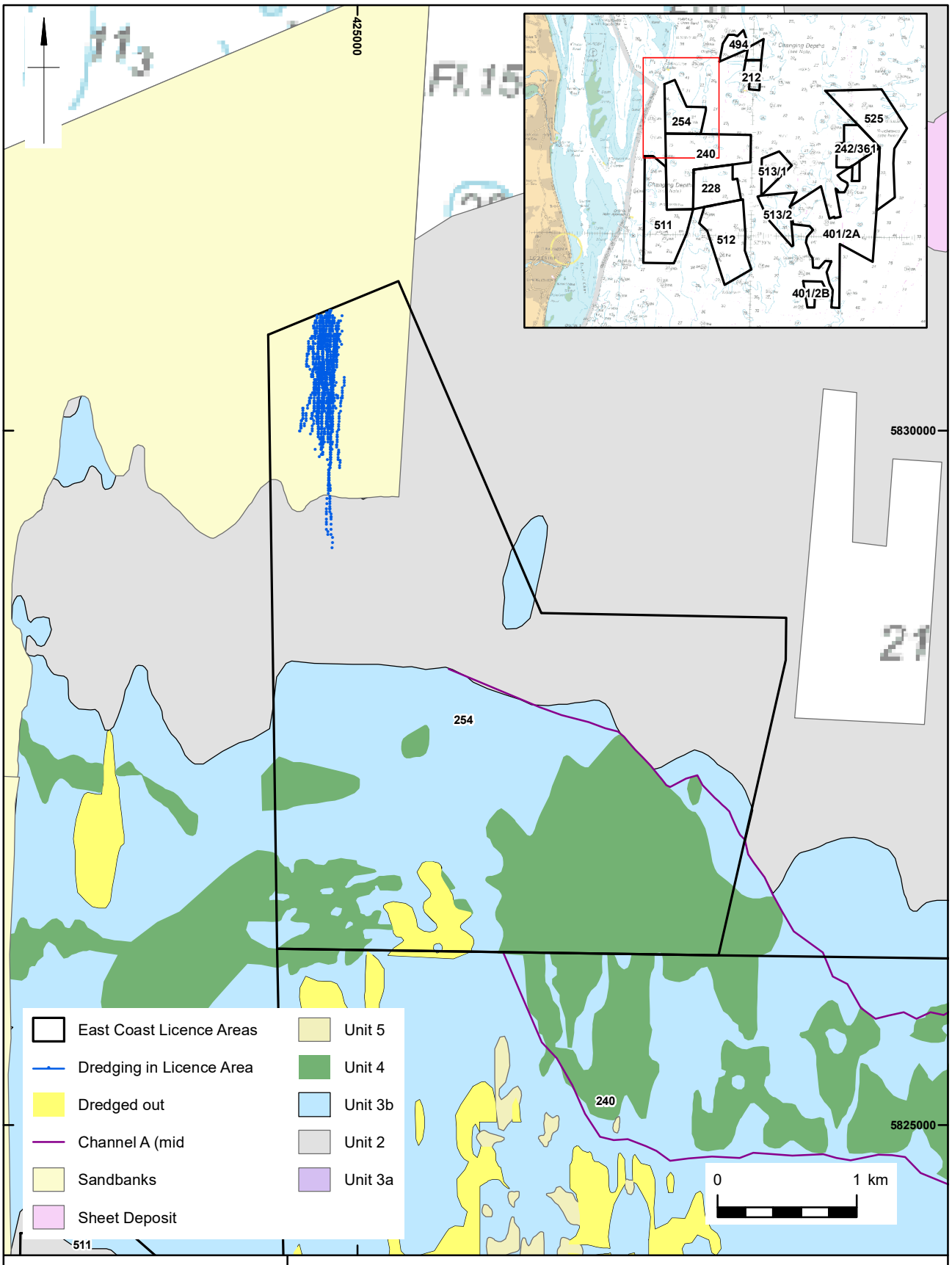
Licence Area 228

Figure 2



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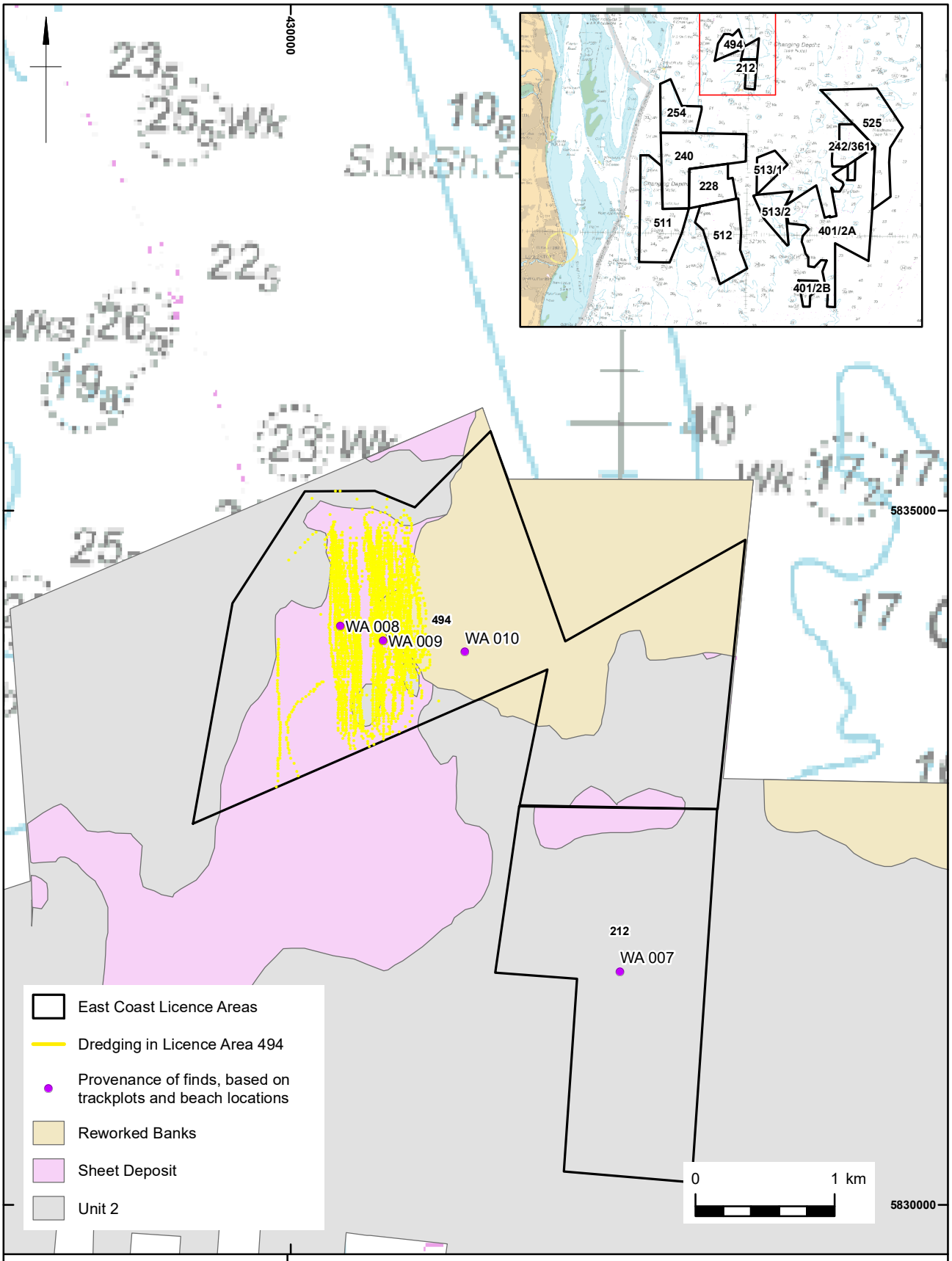
Licence Area 254

Figure 3



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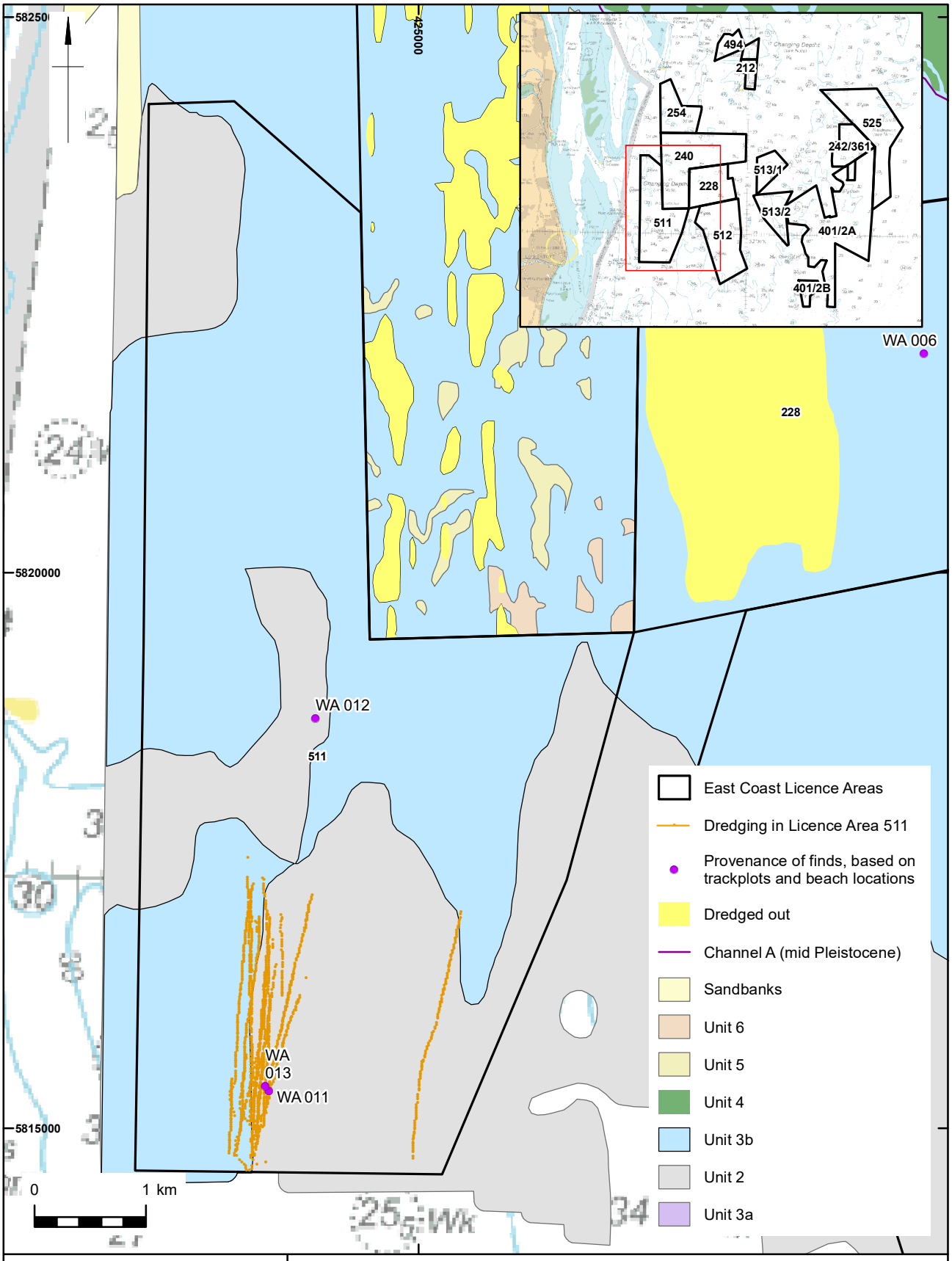
Licence Area 494

Figure 4



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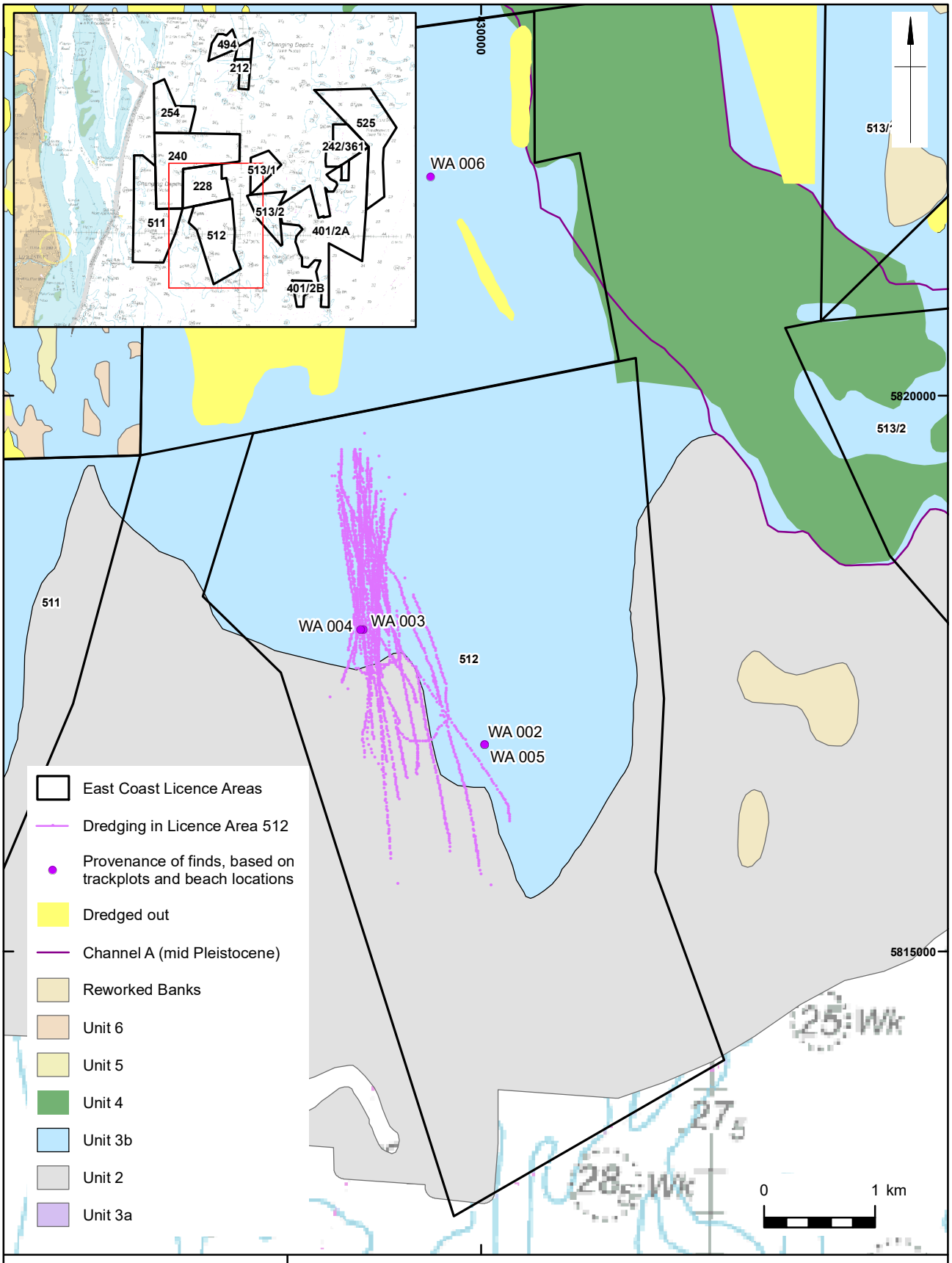
Licence Area 511

Figure 5

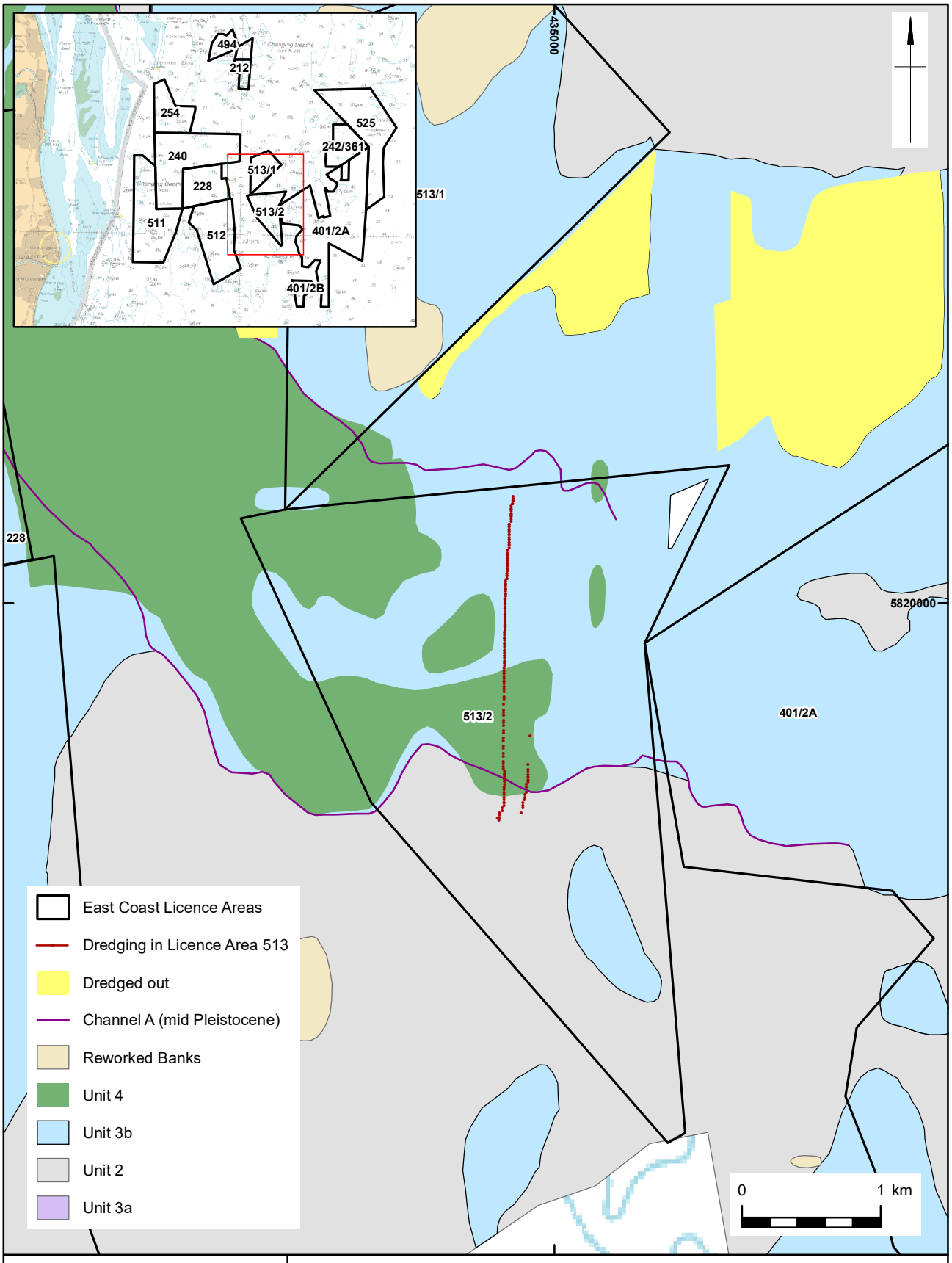


Date:	02/06/2020	Revision Number:	1
Scale:	1:50,000 at A4	Illustrator:	KJF
Path:	W:\Projects\226020\GIS\FigsMXD\Assessment\2020_04_03		

Coordinate system:
WGS84 UTM Z31N

Licence Area 512

Figure 6

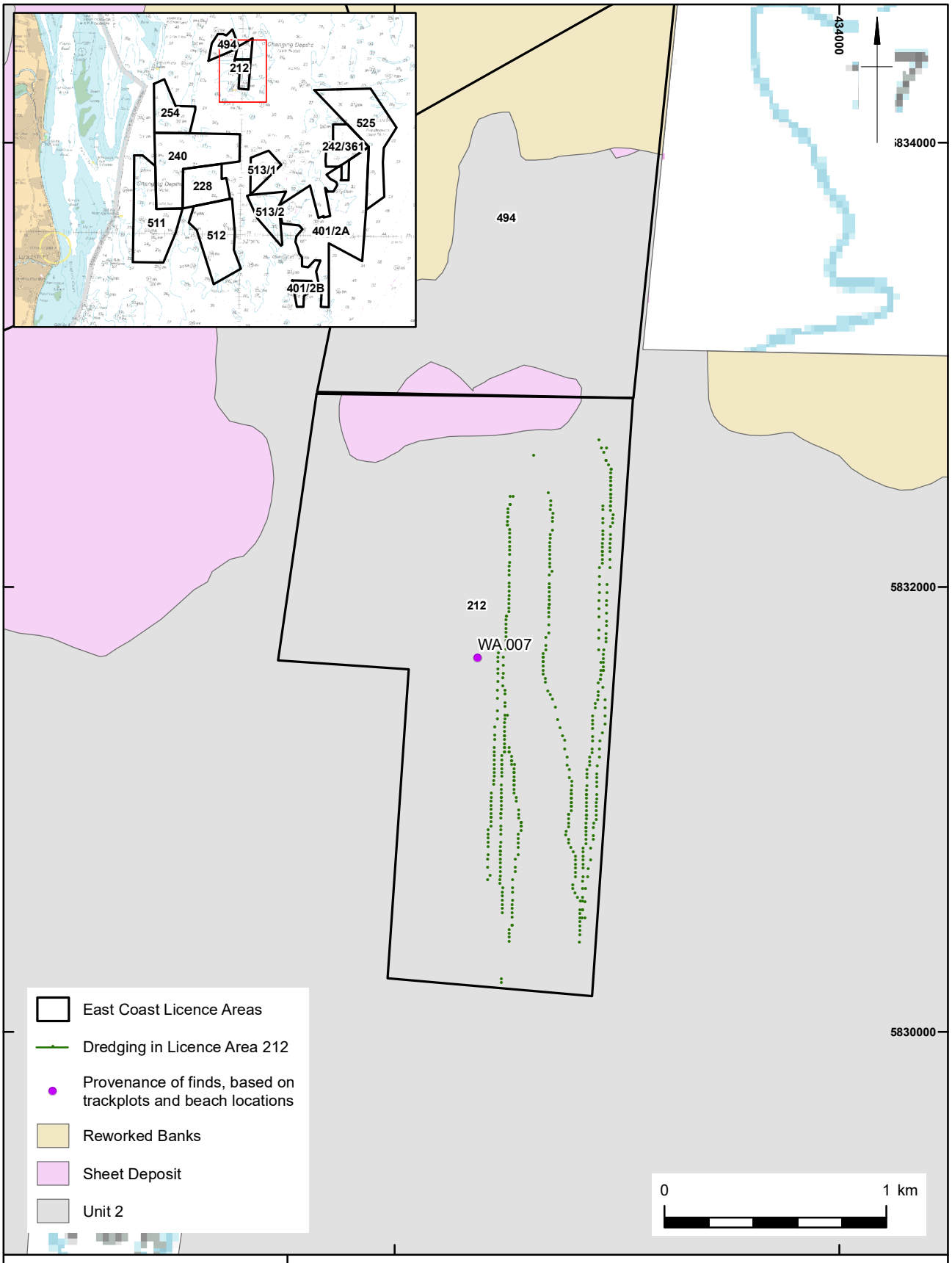


Date:	02/06/2020	Revision Number:	1
Scale:	1:40,000 at A4	Illustrator:	KJF
Path:	W:\Projects\226020\GIS\FigsMXD\Assessment\2020_04_03		

Coordinate system:
WGS84 UTM Z31N

Licence Area 513

Figure 7



Date:	02/06/2020	Revision Number:	0
Scale:	1:25,000 at A4	Illustrator:	KJF
Path:	W:\Projects\226020\GIS\FigsMXD\Assessment\2020_04_03		

Coordinate system:
WGS84 UTM Z31N

Licence Area 212

Figure 8

Plate 1: Example of the steps cut into the sand at the high water mark, courtesy of Simon Lewis

Plate 2: Wider view of the steps cut into the sand at the high water mark, courtesy of Simon Lewis

Date:	06/04/2020	Revision Number:	0
Scale:	Not to scale	Illustrator:	KJF
Path:	W:\Projects\226020\Graphics_Office\Rep figs\assessment\2020_04_03		

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