MORECAMBE BAY PARTNERSHIP

Headlands to Headspace

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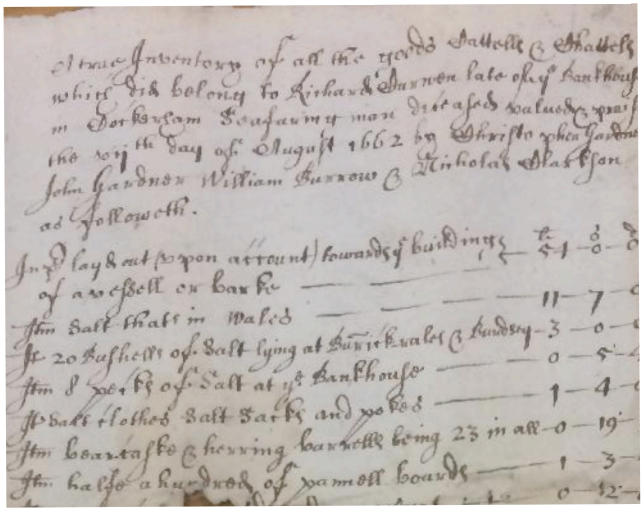

# THE MORECAMBE BAY SALT INDUSTRY:

# AN INITIAL ASSESSMENT

heritage lottery fund

LOTTERY FUNDED

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*Front cover: Excerpt from probate inventory. Lancashire archives W/RW/A/R17D/40*

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## SUMMARY

This report provides a summary of a research project, undertaken alongside volunteers, though professionally led training by Wardell Armstrong Archaeology. It focuses on brining together and initial desk-based assessment of archaeology of the Morecambe Bay salt industry. The project was run by the Morecambe Bay Partnership as part of the Heritage Lottery funded Headlands to Headspace scheme, an initiative motivated by a community desire to protect and celebrate Morecambe Bay's rich heritage. A key aim of the scheme is to improve our understanding of the natural and cultural heritage of the Bay significantly and help conserve this heritage for future generations. This report is an outcome of this project, to record and promote the rich heritage of the Bay.

**ACKNOWLEDGEMENTS**

Morecambe Bay Partnership and Wardell Armstrong Archaeology would like to thank Mark Brennand of Cumbria County Council and Peter Iles of Lancashire Archaeological Advisory Service who provided information from the Historic Environment Record and advice on potential scope for further research. The invaluable guidance and access to information from historian/researcher Jonathan Cass is also very gratefully acknowledged, as is the support of the staff of Lancashire Archives, Preston.

Morecambe Bay Partnership would like to thank all the volunteers who participated in the training and have contributed to the project to date.


The funding received from the Heritage Lottery Fund for the Headlands to Headspace Landscape Partnership Scheme has enabled the volunteer training and this research to be undertaken and is gratefully acknowledged.

**TRAINING, RESEARCH AND REPORT INFORMATION**

The training was led by Richard Newman and Cat Peters of Wardell Armstrong, and the overall project managed by Louise Martin of Morecambe Bay Partnership.

The documentary research was undertaken by Dr Louise Parkinson, Jonathan Cass, Louise Martin and volunteers including Rod Sayers and Collette Lawlor, following the initial desk-based training sessions.

The report was produced by Dr Louise Parkinson and Louise Martin, with contributions by Cat Peters and Richard Newman, who also co-ordinated the reporting phase. The figures were produced by Adrian Bailey of Wardell Armstrong.

Morecambe Bay Partnership would like to thank all the volunteers who participated in the training and have contributed to the project to date. There is significant potential for expanding on and enhancing the initial research outlined in this report.

# 1 INTRODUCTION

## 1.1 Background of the Project

1.1.1 This report provides a summary of a research project undertaken alongside volunteers, though professionally led training, focusing on compiling a record of the archaeology of the Morecambe Bay salt industry. The project was run by the Morecambe Bay Partnership as part of the Heritage Lottery funded Headlands to Headspace scheme (H2H), an initiative motivated by a community desire to protect and celebrate Morecambe Bay's rich heritage. Key aims of this scheme are to improve the understanding of the natural and cultural heritage of the Bay significantly, and help to conserve this heritage for future generations.

1.1.2 An initial phase of the Headlands to Headspace documentary research project was undertaken in Spring/Summer 2015, delivered by Louise Martin and Dr Louise Parkinson. Further research training was deliver by Wardell Armstrong in 2016-7 to built on this project and ensure that "*community participants acquire the necessary skills and knowledge required to undertake documentary research of cultural heritage sites, produce reports and disseminate the results*" (Morecambe Bay Partnership 2015, 1).

1.1.3 The topic of salt production was introduced during training sessions undertaken on Saturday 14th and Saturday 21st February 2017 at Arnside Educational Institute. The latter session also included an overview of the work undertaken by Jonathan Cass using probate records to research the salt industry of Morecambe Bay (Cass 2016). Training was delivered following the Morecambe Bay Partnership guidance (Martin et al 2016). The aim was to furnish volunteers with the requisite tools in order for them to convert their enthusiasm for the heritage of their locality into an archaeological study of a specified area of interest. The specified area of interest summarised by this report was the salt production in Morecambe Bay.

1.1.4 This desk-based assessment comprises the report-producing and dissemination phase of the H2H project, one of six archaeological reports produced as a result of the Heritage Lottery funded H2H Cultural Heritage Documentary Research project.

1.1.5 This initial desk-based assessment focuses on the archaeology of the Morecambe Bay salt industry. In this instance, the term '*study area*' refers to the Headlands to Headspace boundary shown in Figures 1 to 2, although sites in Wyre (south-western coastline of Morecambe Bay) have been included to provide context to the study.

Sites identified through the research are shown in Figure 2 and presented in the gazetteer (Appendix 1).

### 1.2 The Purpose of the Desk-Based Assessment

1.2.1 The desk-based assessment seeks to improve our understanding of the archaeology of the Morecambe Bay salt industry through documentary research, as part of a volunteer training programme.

1.2.2 It brings together previously known and new documentary evidence relating to the salt manufacturing industry in Morecambe Bay and identifies keys salt production sites and areas requiring further research.

1.2.3 The report has been produced to enable the dissemination of the data produced by the project to a wide audience, making the results of the study publicly accessible for future generations. It also presents recommendations to expand and enhance the archaeological record presented in the following report.

## 2 METHODOLOGY

### 2.1 Introduction

2.1.1 All work undertaken was consistent with the relevant standards and procedures of the Chartered Institute for Archaeologists, as set out in *Standard and Guidance for Historic Environment Desk-Based Assessment* (CIfA 2014).

2.1.2 More specifically, this work followed methodologies outlined in the 'Guide to Undertaking Documentary Research and Desk-based Assessments for Volunteers', produced by Louise Martin, Wardell Armstrong and Louise Parkinson for the Morecambe Bay Partnership, in association with Mark Brennand, Peter Iles, Ken Davies and Eleanor Kingston (Martin *et al* 2016).

2.1.3 The data underlying the desk-based assessment was gathered through desk-based study of documentary sources, undertaken by Dr Louise Parkinson and Louise Martin, assisted by volunteers. The training programme was delivered under the supervision of Louise Martin of the Morecambe Bay Partnership by Dr Richard Newman and Cat Peters of Wardell Armstrong.

## 2.2 Sources Consulted

2.2.1 A variety of sources were consulted to bring together primary and secondary evidence of salt making in Morecambe Bay including:

- Cumbria and Lancashire Historic Environment Record data
- The Archaeology Data Service (http://archaeologydataservice.ac.uk/ifp/wiki.pdf)
- The National Heritage List (https://historicengland.org.uk/listing/the-list/)
- PastScape (http://www.pastscape.org.uk/)
- Historic maps online (through National Library of Scotland- http://maps.nls.uk/, Old Maps- https://www.old-maps.co.uk/#/ and Mario- http://www3.lancashire.gov.uk/environment/oldmap/)
- Online websites/projects (Ecosal Atlantis Project)- https://research.bournemouth.ac.uk/2013/01/ecosal-atlantis-project/) and
- Research projects (e.g. Cass 2016)

2.2.2 There is much scope to expand this research through targeted archive research, analysis of aerial and LiDAR images and walkover surveys, which have been include as recommendations in Paragraph 3.4.1 and Section 5.

## 2.3 Glossary

2.3.1 The following standard terms for compiling the assessment are used throughout the report:

- Heritage Asset – a building, monument, site, place, area or defined landscape positively identified as having a degree of heritage significance that merits consideration in planning decisions.
- Historic Environment Record (HER) – an information service, usually utilizing a database, which provides public access to up-to-date and dynamic resources relating to the historic environment of a defined geographic area.
- Significance – the value of a heritage asset to present and future generations attributable of its heritage interest. That interest may be archaeological, architectural, artistic or historic (including historical associations).

# 3 BACKGROUND

## 3.1 Location, Topography and Geology

3.1.1 Given the size of the study area and distribution of possible salt manufacturing sites the location, topography and geology for each key site has currently not been collected/collated as part of this project.

## 3.2 The Process and History of Salt Making

3.2.1 Sodium chloride salt has been important historically for medicinal treatments, cooking, and particularly for food preservation, and evidence for its production are available from Roman times to the present day (Claughton *nd*, 3). In Cumbria, during the 17th and 18th centuries, salt was the third most important industry, behind fishing and farming. Salt making in the southern part of the south Cumbrian coast was not undertaken to the same extent as it was in the north and west. The pans that worked do not appear to have been well documented, and apart from the references to gifts to the abbeys of St. Bees and Calder, nothing is known of their history. It is probable that the pans were smaller than those used in north Cumbria, and firing material would be wood, or later, coal (Martin 2016).

3.2.2 Salt can be obtained from three main sources - rock salt, brine derived from rock salt or from seawater. Salt from seawater can be extracted in several different ways, including:

- Solar – the water is evaporated using the sun;
- Direct Boiling – the water is boiled using artificial heating methods with no prior concentration;
- Prior Concentration – the seawater is treated by either removing water or adding salt to create a concentrated brine before it is boiled.

3.2.3 In the Morecambe Bay area, the methods that were used included direct boiling and prior concentration (Cranstone 2012, 161). 'Sand-washing', otherwise known as 'sleeching', which comprises several processes, and 'selnering' were widely undertaken during the medieval and post-medieval periods. Sleeching involved scraping the salt-encrusted saltmarsh silts, from just below the high water mark, which was raked up by a hap, a horse drawn device (Martin 2017).

3.2.4 The moisture was air dried out of the sand, leaching out the salt content (sleech) and the brine was boiled in a 'saltcote' (Cranstone 2013, 1). This sleeching process could have been undertaken in several ways:

- Foreshore sleeching – the leaching and filtering was undertaken at the foreshore using temporary or mobile equipment;
- Mound sleeching – the leaching, filtering and boiling was undertaken on dry land and the waste silt piled in mounds;
- Enclosed-bed sleeching - an enclosed area of ploughed land was filled with sea water and was filtered and boiled nearby;
- Sand-pit sleeching – shallow ponds filled with coarse sand were flooded with seawater. The coarse sand was then dug up and leached and the brine filtered and boiled (Cranstone 2012, 162).

3.2.5 One method of sleeching occurred in pits or kinches, which were lined with puddled clay (Martin 2017- http://www.cumbria-industries.org.uk/salt/). The sleech was placed into these pits, which were layered with straw and rushes to help the filtering process, and then water was poured over the salted sand, creating brine. This process was undertaken several times until the brine was 'sufficiently concentrated to 'float an egg' (*ibid*). Evidence for this industry in Morecambe Bay is outlined by Dr William Brownrigg in his 1748 book 'The Art of Making Common Salt' which states "*that salt was formerly made at Ulverston from brine prepared by washing caked sea salt from dried shore sand*" (*ibid*).

3.2.6 Following the sleeching process, the brine would be boiled in a saltcote, which was a small building/hut with a hearth, used for boiling the brine in lead pans using peat or wood for fuel (Cranstone 2013, 1). Some such buildings have been excavated in Lincolnshire, revealing that they were timber-framed, with a thatched roof, typically located on top of a sleeching mound to raise it above storm and high tide levels (ibid). The boiling of salt produced 2 gallons (9.1 litres) of salt in four hours, with the prepared salt being hung in wicker baskets to dry (Martin 2017).

3.2.7 Whether the saltcotes identified in the study area (see gazetteer) served a single saltworks or a number of salt processing sites is unclear and requires further research. Based on investigations to the north of the study area, on the Solway coast/Holm Cultram, Cranstone has proposed that tenants produced concentrated brine in the marshland, which would be taken to a single boiling area/saltcoate, under the direct control of the monastic and later landlords (2013, 1).

3.2.8 John Lucas, in his 'History of Warton' from the 17th century, provides a detailed technical account of the processes of salt-production undertaken at Gallihow in Morecambe Bay:

3.2.9 *"In hot Weather, during the neep Tides, they harrow with a Thorn, or such like Thing, the Flats that are always overflowed by the Spring Tides, and then with a proper Instrument, skim or scrape together into Ridges, the Surface of them, which they lead away in Caups and preserve it under Cover. This Sand so provided they put into Troughs or Pits lined with fine blue Clay, with Holes at the Bottom, and pour fresh Water thereon, which draining through the Sand, carries the Salt therein contained down with it into the Vessels placed under to receive it. So long as this Liquor is strong enough to bear an Egg, they pour in more Water, and as soon as the, Egg begins to sink, they cast the Sand out of the long Pits or Troughs (which may be seen in vast Heaps near the Salt Cotes) and replenish them again. This Water thus impregnated with Salt they boil with Turf (of which they have great Plenty and very good) till the Water evaporating, the Salt remains behind. They here, as do the Salt Boilers at Droytwych in Worcestershire, make Use of leaden Pans, wherein none of the small white Sand, or Stone Powder is to be found, which is so troublesome to the Salt-Works at Shields and other Places where they use iron Boilers. The Salt made here is indeed not so white as that made at the Places above mentioned; but in Recompense for that, we must observe what is said by the learned and curious Dr. Lister, who recommending the gray Salt made by the Heat of the Sun, and of general Use through all France says, Our People are nice to a great Fault about the Whitness of their Salt; a Thing not to be procured without vehement Boiling, which makes it so very hot, that it causes Thirst, and reeses & spoils every Thing it should preserve; and then adds, that he never saw Salt right made at any Place in England, but at the Salt Cotes on these and the neighbouring Sands*." (McIntire 1937, 132-133)

3.2.10 The process described here by Lucas suggests mound sleeching was undertaken in this part of Morecambe Bay in the 17th century. Across the Bay at Flookborough (Asset No. **9**) possible archaeological evidence for mound sleeching has been identified (Healey and Lee 2008).

3.2.11 Peat located in high-tide level zones, such as at Morecambe Bay, contains salt that can be extracted through a process known as selnering. The peat is cut, air-dried and burnt. The salt is leached from the ashes to form a brine that can then be boiled. The peat was often burnt close to where it was excavated, but the subsequent processes were undertaken in towns (Cranstone 2012, 162).

3.2.12 A more industrialised version of salt extraction was conducted using a 'panhouse'. This was a direct boiling method used from the late Medieval period onwards. They were specifically designed for the process and fuelled by coal (Cranstone 2012, 163).

The salt manufacture at Walney Island (Asset No. **1**) and Preesall (Asset No. **34**) during the 19th century is typical of this type of process.

### 3.3 Archaeological and Historical Background

3.3.1 This historical and archaeological background is compiled from secondary sources and primary records consulted during the desk based research. It is intended only as a summary of historical developments relating to the salt industry of Morecambe Bay. Given the nature of this project it is acknowledged that there may be further sources of information still to be collected. The location of known heritage assets within the study area are illustrated in Figure 2, and summarised in Appendix 2. Gazetteer entries referred to in the text are shown in bold e.g. (Asset No. **10**).

3.3.2 ***Prehistoric Period (30,000 BC-AD 43):*** archaeological evidence for salt manufacture is lacking in the Morecambe Bay area during this period, although beyond the study area natural brine springs were exploited from the Iron Age onwards at sites such as Droitwich in Worcestershire, and Nantwich, Middlewich and Northwich in Cheshire (Cranstone 2012, 160; Cool 2006, 57). One indicator of early salt production sites is waste pottery, known as briquetage or Very Coarse Pottery (VCP), which was used for the construction of hearths and containers. The trade and exchange of salt can be seen through the distribution of briquetage or VCP, which was used for its production and transportation around the UK (Hodgson and Brennand 2006, 56-57). This debris has been recovered from sites found along the east and south coasts of England, which have created earthworks called 'Red Hills' (Fielding & Fielding 2006, 13). It is interesting to note that at Arnside, there is an area called 'Red Hills' (OS 1862, http://maps.nls.uk/view/102347934), which is also close to later post-medieval salt production locations (**12**). However, this place-name evidence may be due to other reasons, such as geology.

3.3.3 ***Roman Period (AD 43-410)*****:** whilst salt production was undertaken during the Iron Age and, perhaps earlier, it became more widespread and controlled during Roman rule (Alcock 2010, 73). In this period, salt was exploited from both seawater and inland brine sources. Seawater was evaporated in clay-lined tanks to produce a concentrated brine. This was then heated in iron or lead pans to form salt (*ibid*). Known sites in the north west of England for inland brine sources include those in Cheshire, where industrial scale production has been recovered from Nantwich, Middlewich and Northwich (Philpott 2006, 83). Whilst no evidence has been recovered for salt production in Morecambe Bay during the Roman period, it is highly likely that it took place. Evidence of briquetage was encountered during an

evaluation at Wallsend on the Solway Coast to the north of Morecambe Bay (Martin 2011). The evaluation recovered 14 pieces, including a sherd of flue tile, indicating that salt making was undertaken on the Solway Coast during the Roman period. This salt would have supplied the local Roman forts, such as Maryport and Ravenglass. The fort at Lancaster would have most likely used salt from local sources within Morecambe Bay (McIntire 1942, 2).

3.3.4 ***Early Medieval (c. 410 to 1066)*****:** evidence for salt-making activity is lacking during this period, even at the long-utilised sites in Cheshire. It has been proposed that the brine springs may have shifted over time causing the activity to move with it. There is still some evidence of the continuity of salt production occurring at Droitwich in Worcestershire (Newman 2006a, 110). No evidence is known from within Morecambe Bay.

3.3.5 ***Medieval (1066-1540)*****:** the earliest documentary evidence for salt production was in the Domesday Survey of 1086 in Cheshire and this has since been supported by archaeological evidence in Nantwich, Middlewich and Northwich (Newman 2006b, 135). A medieval and later saltway route running from Cheshire via Manchester to Knaresborough and Wetherby has been identified (LCC HER 2104) showing the importance of salt as a commodity and its trade within the UK.

3.3.6 In Morecambe Bay, it has been proposed that as no salterns were recorded in the Domesday Book, salt production may have developed at a later point in the Norman period (Archaeological Research Services Ltd 2009: 236). This proposal is contested by documentary sources attesting to its presence, such as the monasteries, which were involved in the production of salt. At Furness Abbey, there were several sites nearby that were exploited including Mustard Haw at Salthouse, Barrow (Asset No **3**) and Salthouse, Millom, near Marsh Grange and near Angerton Moss (Wooler 2011, 27-28; Newman 2006b, 130). Conishead Priory (Asset No. **5**) was another monastic site that exploited salt (Cubbon 2015, 13). The location of the salt works has been described as "*betwixt Conishead and Ulverston pule*" (West 1774, 186) and at Haverigg, near Millom (Greenlane Archaeology Ltd 2009).

3.3.7 The de Bethum family owned land at Arnside during the 12$^{th}$ century, which included salinae or salt-pans (Asset No **12**). These were located all around the peninsula and were a source of great wealth for the de Bethums. Indeed, documentary sources of grants given to various religious houses by the de Bethums often expressly exclude the salt-pans (McIntire 1937, 132). Between 1184 and 1190, Ralph de Bethum granted a saltern at Flokesti in Beetham to the canons of Cockersand (Asset No. **30**).

The canons were allowed to place this wherever they liked, except at Harnolveshevet (*ibid*).

3.3.8 Due to the valuable nature of salt and salt production in Morecambe Bay, regulations on the land were put in place during this period. For instance, the burning of turves for domestic or saltcoat consumption was differentiated according to regulations pre-dating 1326 in Cockerham (Cass 2016, 12). The tidal flats were divided into 'sand floors' and the use of sand from the foreshore was strictly controlled (*ibid*).

3.3.9 It is believed that the salt manufacturing process at this time was done by 'sleeching', resulting in piles of clean silt called 'sleeching mounds', some of which may still be recognisable today (Archaeological Research Services Ltd 2009, 236).

3.3.10 ***Post Medieval (1540-1900)*****:** the vast majority of the heritage assets relating to salt production in Morecambe Bay date to the post-medieval period, mainly due to their preservation in documentary sources, such as in probate records (Bankhouse/ Thurnham **(**Asset No **19)**, Uptowne, Near Cockerham **(**Asset No **20)**, Cockerham **(**Asset No **21)**, Crimbles (Asset No **22)**, Haire Stones **(**Asset No **23)**, Cockerham Marsh **(**Asset No **24)**, Wrampool/e **(**Asset No **25)**, Ferane Hill, Hakensall, Pressall, **(**Asset No **27)**, Poulton Homes and Thornton Asset **(**Asset No **29)** (in Cass 2016). Tenancy agreements also contain information about the industry and arrangements with the landowner such as

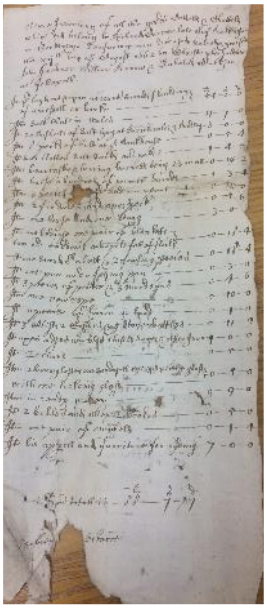

*Plate 1. Example of probate inventory, which lists items associated with salt production. Lancashire Archives W/RW/A/R17D/40. See Cass 2016.*

3.3.11 At Storey's Grange Hambleton (Asset No **36**), where salt was produced from the 15th to early 18th centuries. The tenancy agreements provided the 'saltweller' the right to cut turf from the moss.

3.3.12 Contemporary records, such as Leland's visit to Cockerham in 1536, detailed in the Township record for Cockerham in the Victoria County History (Farrer and Brownbill 1914, 89-93), present a verbal description of this important industry, which states *'From Garstang I passed partly by moor ground, partly by pasture and some corn; and so riding over Cocker river, that maketh no great course ere he come to the sands by Cockerham village not a mile off. Upon the which sands I passed over Cocker river once or twice again, not without some fear of quicksands. At the end of the sands I*

*saw divers saltcotes, where were divers heaps of sands taken of saltstrands, out of the which, by often wetting with water they pike out the saltness, and so the water is derived into a pit, and after sodde'.*

3.3.13 Estate and manorial sales also provide evidence for the industry, for example the sale of the Manor of Thurnham by Henry Grey Duke of Suffolk to Thomas Lowne in 1552. The manor at this date comprised '*lands, two water-mills, twenty salt-pit*s & c. in Thurnham, Glasson and Cockerham (footnote 9, in Farrer and Brownbill 1914, 101-5).

3.3.14 Place-names and cartographic sources provide a good source of information, and former salt production sites are likely to be represented by place-names such as Saltcoates Ulverston (Asset No **8),** Salt Cotes/Cote Stones, Carnforth **(**Asset No **15)**, possibly Salt Aye, Lancaster **(**Asset No **17)** and Salt Cote Brow, Glasson, **(**Asset No **18)**. Examples of cartographic sources are shown in Plates 2 to 8. The place-name Saltcote has Anglo-Saxon origins and in Cumbria the names are a mix of Anglian, British, Norse and Scando-Norman, which Cranstone (2013, 1) suggests demonstrates that the word is pre-Viking.


*Plate 2. Excerpt from Greenwoods 1818 'Map of Lancashire' showing 'Salt Cotes' to the east of Barrow Head (Asset No **3**)*


*Plate 3. Excerpt from 1850 6 inch to 1 mile Ordnance Survey map showing Salt-Cotes (Asset No **8**) on the coast to the east of Ulverston. Surveyed 1846-7. Lancashire sheet XVI. Reproduced with Permission from National Library of Scotland*


*Plate 4. Excerpt from 1862 6 inch to 1 mile Ordnance Survey map showing Saltcote Wood (Asset No **37**) to the south of Meathop. Surveyed 1857. Westmorland Sheet XLVI. Reproduced with Permission from National Library of Scotland*


*Plate 5. Excerpt from the 1862 Ordnance Survey map of the Arnside/Storth area showing Salt Cotes to the south-west of Storth (Asset No **11**) and north-east of Arnside (Asset No **12**). Westmorland Sheet XLVI. Reproduced with Permission from National Library of Scotland*

3.3.15 The salt-producing industry is termed as 'saltwelling' in the documentary sources of this period, and was described in detail by Lucas in the 17th century (Mourholme Local History Society 1998, 143). The documentary evidence provides many interesting details into the salt production industry and the people who were involved within it. Extensive research on probate records, undertaken by Jonathan Cass, has revealed that during the period of 1661-1671, the southern part of Morecambe Bay was heavily involved in the salt industry. Probate records analysed from this period records 74 saltpans and 12 saltcoats in the area (Cass 2016, 10), including at Bardsea (Asset No. **4**), Swarthmoor (Asset No **7**) Ulverston Moss (Asett No. **6**) and Lindall/Lindale (Asset **10**).

3.3.16 Salt-making was a temporary occupation carried out during the summer months only and the 'saltwellers' were required to work in other professions for the rest of the year, mainly in agriculture. Two such 'saltwellers' were Richard Abram and James Dixon, who were working in 1701 in Warton (Asset **14).** They were joint owners of a saltcoat, which was destroyed by storms and were forced to request relief to the Justices at the Preston Sessions in 1702 (Cass 2016, 6). The buildings (or 'saltcoats') were, perhaps, semi-permanent structures used purely for salt production and the storage of equipment (*ibid*).

3.3.17 However, due to the nature of the work, they were generally sited close to the shoreline and were therefore vulnerable to adverse weather conditions. In 1720,

another storm hit the coastline and the whole salt industry from Pilling to Cockerham was destroyed (Cass 2016, 7). Both these storms devastated the salt-making industry in parts of West Lancashire and it never fully recovered. Whilst the storms did affect the Cumbrian coast of Morecambe Bay, it did not completely ruin the infrastructure. In Ulverston in particular, the salt industry continued to thrive (Cass 2016, 9-10). Another reason for the decline of the salt industry in Morecambe Bay was due to the discovery of rock salt in 1670 in Marbury, Cheshire (Fielding and Fielding 2006, 16). It was refined in Liverpool and exported to the rest of the UK (Mourholme Local History Society 1998, 143).

3.3.18 On Piel Island, at the north-western extent of the study area, a salt works is mentioned in 1662 and 1701 (Cubbon 2015, 13) and a newspaper article of 1824 in the Lancaster Gazetteer refers to a salt works at Slyne with Hest, however, its exact location is unknown (Asset **16**).

3.3.19 To the north of Morecambe Bay on the Solway Coast, further evidence of the salt industry is known, such as at Crosscanonby. The saltpans there are known to have been operating in 1684, but went into decline in 1790 due to competition with the Cheshire salt industry. Earthwork traces of the tanks survive today and the archaeological evidence suggest it was a direct boiling site, rather than a sleeching site, as the documentary records suggest (HER 3061). Other known saltpan sites on the Cumbrian coast include Whitehaven (HER 5554) and Lowca (HER 6509), which date to the 17$^{th}$ century (Cranstone 2006).

3.3.20 There are some physical archaeological remains of salt making surviving in Morecambe Bay, and there is the potential for similar evidence surviving for other sites listed in the Gazetteer. At Pilling (Asset **26**), outside the H2H project area rectangular pits, a salt mound and building suggest salt working, supported by evidence from probate records. Targeted examination of LiDAR/aerial images alongside site visits and walkover surveys may help expand the current knowledge of the salt industry in the area during the Post-Medieval period

3.3.21 ***Modern (1900-present)***: salt was discovered on Walney in the late 1880s, and the Barrow Salt Company and Walney Salt Works (Asset **1**) was constructed in the 1890s. This comprised land reservoirs, filter beds, an evaporation plant, six chimneys and 24 pans, and made use of an existing timber pier, built in 1870 for exportation.

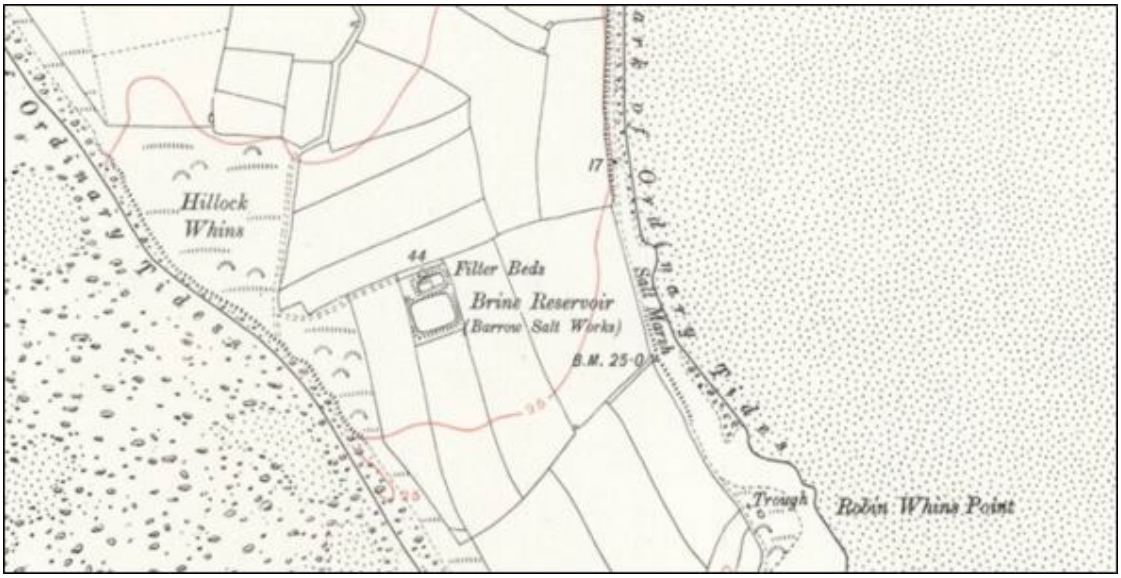


*Plate 6. Excerpt from 6inch to 1 mile 1914 Ordnance Survey map of Walney showing the filter beds associated with the Barrow Salt Works (**1**), located to the east of Hillock Whins. Revised 1910. Lancashire Sheet XXVII.NE. Reproduced with Permission from National Library of Scotland*

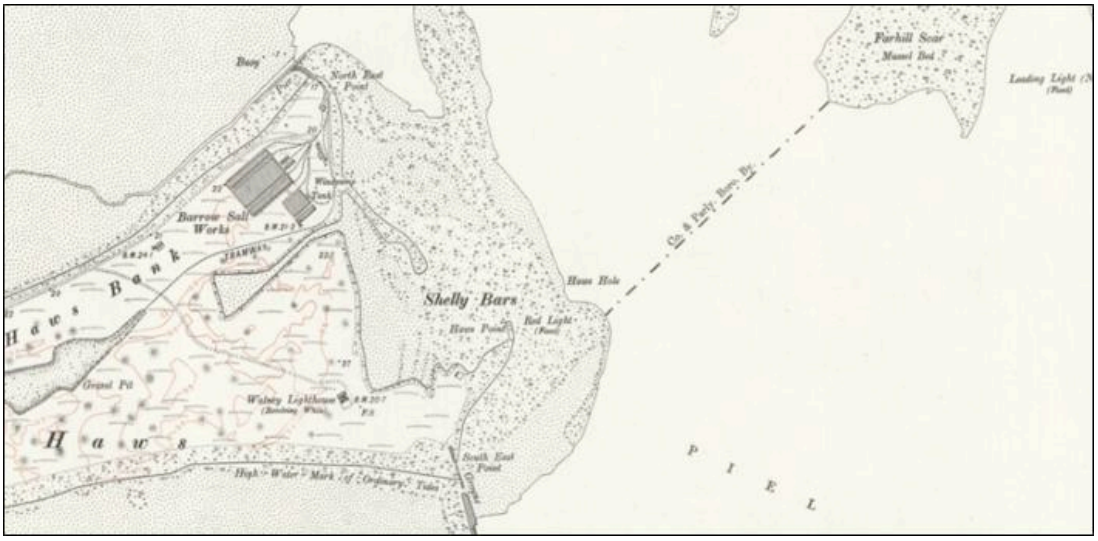


*Plate 7. Excerpt from 6inch to 1 mile 1919 Ordnance Survey map of Walney showing the Barrow Salt Works (**1**) located at the southern extent of the island. Revised 1910. Lancashire Sheet XXVIII.SW. Reproduced with Permission from National Library of Scotland*

3.3.22 The Barrow salt works were in use until 1909 (www.walney-island.com). Surviving traces of the former salt works include earthworks and large water-filled ponds, recorded during the North West Rapid Coastal Zone Assessment (Johnson 2009, 205). The history of this industry is presented in detail in Cubbon's 2015 publication of Barrow Salt.

3.3.23 Just outside the Morecambe Bay H2H study area, rock salt was discovered at Preesall in Lancashire in 1872, leading to the formation of the Fleetwood Salt Company in 1883 (Fogg 2015). From 1893, they mined rock salt and pumped brine through pipes to an open pan salt works at Fleetwood (Fielding and Fielding 2006, 26). A comprehensive overview of the history plans of the sites and techniques of extraction (including illustrations) of the Preesall/Fleetwood works in presented in volumes of The Over-Wyre Historical Journal and by the Northern Mine Research Society (see Hogarth and Heapy 1980-81, Hogarth 1982-3. 12-20, Hogarth, 1984-5, 32-37, Hogarth and Binns 1986-7, 31-47, Hogarth 1988-9, 34-36 and Lawless 1979 37-43). The rock salt industry continued until ingress of water forced the mine to close in 1931, however, the pumping of brine for the chemical industry (United Alkali Co., later I.C.I) continued until relatively recently (Hogarth 1998-9, 36). All that that remains above ground of this once thriving industry is 'some odd bricks of brickwork, strange metal objects….and some large lake caused by collapses into the hollowed-out caverns beneath. One of these was, known locally as the Bottomless Pit, swallowed farm buildings and part of an orchard' (Fogg, 2015).

## 3.4 Cartographic and Pictorial Sources

3.4.1 A number of cartographic sources have been studies during this project (see Plates 2-7 for examples), however, full map regressions for the sites listed in the gazetteer have not been undertaken. A list of Ordnance Survey cartographic sources is presented below and it would be beneficial to undertake a full analysis and review as part of continuing research into the salt industry of Morecambe Bay.

OS 1895 (6 inch), Sheet 30 (http://maps.nls.uk/view/102343805)
OS 1893 (25 inch), Sheet 30.11 (http://maps.nls.uk/view/126515216)
OS 1848 (6 inch), Sheet 24 (http://maps.nls.uk/view/102343781)
OS 1891 (25 inch), Sheet 24.3 (http://maps.nls.uk/view/126514883)
OS 1910 (25 inch), Sheet 24.3 (http://maps.nls.uk/view/126514886)
OS 1952 (1: 25,000), Sheet SD47 (http://maps.nls.uk/view/91743466)

OS 1862 (6 inch), Sheet 46 (http://maps.nls.uk/view/102347934)
OS 1913 (25 inch), Sheet 46.6 (http://maps.nls.uk/view/125824980)
OS 1952 (1:25,000), Sheet SD 47 (http://maps.nls.uk/view/91743466)
OS 1850 (6 inch), Sheet 16 (http://maps.nls.uk/view/102343745)
OS 1895 (6 inch), Sheet 16 (http://maps.nls.uk/view/102343742)
OS 1919 (6 inch), Sheet 16NE (http://maps.nls.uk/view/101100866)
OS 1933 (25 inch), Sheet 16.8 (http://maps.nls.uk/view/126514436)
OS c.1873 (6 inch), Sheet 21 (http://maps.nls.uk/view/102343772 )
OS 1895 (6 inch), Sheet 21 (http://maps.nls.uk/view/102343769 )
OS 1913 (25 inch), Sheet 21.12 (http://maps.nls.uk/view/126514796)
OS 1933 (25 inch), Sheet 21.12 (http://maps.nls.uk/view/126514799 )
OS 1956 (1: 10,560)
(https://www.oldmaps.co.uk/#/Map/318276/468225/10/101324)

3.4.2 In addition, analysis of Google Earth and other aerial images such as LiDAR is still to be completed. To date, no pictorial sources of the salt making in Morecambe Bay industry has been identified, such as images (photographs, engravings and/or paintings) of former buildings associated with the industry and further research is required to determine if any evidence survives in the archives/private collections.

## 4 SITE VISITS

4.1.1 To date, none of the sites listed in the gazetteer have been subjected to a site visit. It would be prudent to visit potential sites where evidence of salt production may still be extant/surviving. To determine which sites would be suitable for site visits, analysis of cartographic, aerial and LiDAR assessment should be undertaken, alongside analysis/plotting of the former coastline to establish where areas of marshy/waterlogged land may have been used in salt production e.g. Ulverston (the environs around Salt Cotes) at Meathop (in the area around Salt Cotes Wood), Arnside, Slyne with Hest, Warton and Thurnham/Cockerham.

4.1.2 Coastal salt making sites are often difficult to identify, often-situated in marshland susceptible to flooding, which can cover and mask sites with alluvium (Lane 2013, 4). In addition, coastal processes and erosion of the coastline around Morecambe Bay, along with modern redevelopment, may have removed the ephemeral evidence left behind from former salt extraction processes. Prior to undertaking site visits/walkover surveys, it would be prudent to gather together a corpus of archaeological features that attest to salt production in other areas, such as the

Solway coast and bring in professional advice and guidance on the identification of such sites.

## 5 CONCLUSIONS

5.1.1 The work presented in this report is an initial desk-based assessment of readily available research into the salt making industry of Morecambe Bay. It demonstrates that the production of salt was an important industry in Morecambe Bay, particularly in the 17th and 18th centuries. Evidence for this industry survives in place-names and documentary evidence, however, apart from in the Pilling area and the later works in Barrow, physical evidence for the industry is lacking.

5.1.2 This study has brought together sites of potential interest and should be used as a baseline to expand the research and to identify any physical archaeological evidence, such as pits, depressions, channels and mounds, and even vestiges of buildings, survive around the Bay.

5.1.3 Additional research that could be undertake to expand and enhance this project includes:

- analysis of cartographic resources for each site listed in the gazetteer (and any found through additional research), including Tithe and estate maps;
- analysis of aerial photographs and LiDAR for sites listed in the gazetteer and across the wider coastline of the Bay;
- archive searches for salt production sites listed in the gazetteer and through additional research (see Table 1 below);
- further research of primary/secondary publications sources;
- research of newspaper records;
- research the methods of salt production (e.g. Browning 1748) and physical evidence that may survive of former salt working sites;
- liaison with specialist researchers such as David Cranstone and Andrew Fielding.

5.1.4 This project has been a rare opportunity to teach archaeological research skills to the local communities of Morecambe Bay, and reconnect them with their past. In doing so, they have contributed to an improved knowledge of the salt industry of Morecambe Bay.

| *Archive* | *Reference* | *Date* | *Description* |
|---|---|---|---|
| Lancashire | NWW 1/1/1 | 1829 | Lancashire Archives Plan and sections of the west end of salt area showing the excavation required for improving the navigation of the River Lune, by Jonathan Binns |
| Lancashire Archives | DDX 234/21 | *nd* | Photograph of Saltcotes Cottages (unknown location) |
| Lancashire | QSB/1/248/7 | 1641 | Ulverston- information concerning possession of a saltcote |
| Lancashire | QSP/870/9 | *c*. 1701/2 | Cockerham- destruction of saltcote of Peter Townley by flood |
| Cumbria-Kendal | WD D/Ha 8 | 1609 | Bundle entitled "Deeds of Messuage and lands at Ulpha"<br>1614 Conveyance by Christopher Martindale to Mathew Matindale of Saltcote at Ulva |
| Lancashire | QSP/1102/8 | *c.* 1716 | Warton- shipwreck and loss of salt |
| Lancashire | QSP/635/5 | 1687 | Lancashire County Quarter Sessions- Cockerham- hearth tax for salt-kilns |
| Lancashire | QSP/870/1 | 1701 | Lancashire County Quarter Sessions- Dalton-in-Furness- offences concerning salt-duty |
| Lancashire | QSP/1388/2 | *c*. 1734/5 | Ulverston-removal of salt without licence from works of Moses Benson |
| Lancashire | DDCA 17/218 | *n.d*. *c*. 1840 | Notes-grant of salt works to Conishead priory and Town farm rent. (By J. Stockdale?) |
| Lancashire | QSP/1428/2 | *c*. 1737 | Lancashire County Quarter Sessions.<br>Lancaster - deposition concerning salt in sloop "THE WILLING MIND" cast on the North Wharf at Wyre mouth. |
| Lancashire | DDX 901/1/1/2/ | 1741 | Richard Wicksteed of Ulverstone, Collector of Salt Duty Bond and Obligation in the sum of £65 5s. |
| Lancashire | DDCA 13/M/167 | 1785 | John Brookbank late of Cartmel, now of Sparth in Clayton-le-Moors, gent., to Lord George Cavendish: for £47.17.6.: -- Barker Mosses; also tenement at Carkbeck called Salt Coats |

| *Archive* | *Reference* | *Date* | *Description* |
|---|---|---|---|
| Lancashire | DDCA 13/R/246 | 1720 | Lease for 7 years at £43 rent : Sir Thomas Lowther to William Rigg of Salt Coat in Holker Parke, yeoman - closes called the Prockter Meadow, Horsebriggs Meadow, Deerpark and Barkerfield, Barrow Meadow, Saltcoat Bush, Moss Ends and Godderside Marsh, parcel of Holker Demesne. |
| Lancashire | DDH 188 | 1749 | Feoffment: for 5/-: Moses Benson of Ellers in Ulverstone, yeoman, to Bridget & Dorothy his daughters -- messuage in Ellers called Steps House; also the Parrock & a mossroom in Ulverstone Moss; also a salt-coat or sand floors in Ulverstone Moss -- Witn: John Holme, Ann Holme, John Penington. |

*Table 1. List of possible archive sources relating to the salt industry of Morecambe Bay*

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# APPENDIX 1: HERITAGE ASSET GAZETTEER

*Heritage Assets within the study area of the salt-making sites in Morecambe Bay*

| ***Asset No.*** | ***Reference*** | ***Site Type*** | ***Description*** | ***Grid Reference*** | ***Period*** |
|---|---|---|---|---|---|
| 1 | Cubbon 2015;<br>HER 43999;<br>OS 1956 (1: 10,560) (https://www.old-maps.co.uk/#/Map/318276/468225/10/101324) | Salt-making site, Walney Island | Barrow Salt Company produced salt on an industrial scale from the 1890s to 1909 on Walney Island. There are three sites of interest: Brine Wells just to the south of Biggar village, the holding reservoir and filtration plant at Hillock Whins and the factory built adjacent to the shipping pier. This pier was originally constructed for a gravel extraction works. 'Salting' is annotated on the OS map (1956) on the southern tip of the island where gravel extraction was undertaken | 319900,465800, 319400,464700, 322900,462600 | Industrial |
| 2 | Cubbon 2015, 13 | Salt works, Piel Island | A salt works is mentioned in 1662 and 1701 at Piel Island | *c*. 323328,463822 | Post Medieval |

| *Asset No.* | *Reference* | *Site Type* | *Description* | *Grid Reference* | *Period* |
|---|---|---|---|---|---|
| 3 | Cubbon 2015, 12; PastScape 37637; OS *c*. 1873 (6 inch), Sheet 21; OS 1895 (6 inch), Sheet 21; OS 1913 (25 inch), Sheet 21.12; OS 1933 (25 inch), Sheet 21.12; HER 2910 | Salt-making site, Mustard Haw | The medieval salt pans at Mustard Haw were established by the monks at Furness Abbey and were destroyed in 1872 during the construction of the loop-line from Salthouse Junction to Parrock Hall.<br>The name 'Mustard Haw' is not annotated on any of the OS maps, although we know its location from ADS and PastScape. On the 1st Edition OS Map (*c*. 1873), the area known as Salthouse in Barrow is annotated, along with Salthouse Villa and Salthouse Cottages, all located just to the north of Mustard Haw. The exact location of Mustard Haw is annotated 'Timber Pond', although to the east of this is 'Salthouse Marsh' and the ruins of Parrock Hall are to the east of this. To the south of this is a 'Salthouse pool'. On the next OS Map (1895), Mustard Haw/Timber Pond has been replaced by a Paper Pulp Mill. 'Salthouse pool' is annotated just to the south of the mill indicating that salt manufacture may have continued. No changes are shown on the 1913 and 1933 maps | 321680,468800 | Medieval |
| 4 | Cass 2016 | Possible salt-making site, Bardsea | Probate records from Bardsey/Bardsea suggest salt-working. These could be connected to those at Ulverston/Conishead Priory.<br>Possible place name 'White Gill Lane' nr Bardsea (329500 474800)- identified by Collette Lawlor | *c*. 330098,474472 | Post-Medieval |

| *Asset No.* | *Reference* | *Site Type* | *Description* | *Grid Reference* | *Period* |
|---|---|---|---|---|---|
| 5 | Cubbon 2015, 13; OS 1850 (6 inch), Sheet 16); OS 1895 (6 inch), Sheet 16; OS 1919 (6 inch), Sheet 16NE; OS 1933 (25 inch), Sheet 16.8; HER 2392 | Possible site-making site, Conishead Priory | Possible 12th century salt manufacture associated with Conishead Priory (Cubbon 2015: 13). Documentary sources suggest salt was from Haverigg (HER). On the 1st edition OS map (1850), 'Salt Cotes' is annotated, with associated structures to the north of Conishead Priory, although this may the one in Ulverston. On the 1895 map, this is at Sandside. Salt Cotes still extant on the 1919 and 1933 maps.<br>'The *Priory* was originally a hospital founded by Gabriel de Pennington, Knight, for the relief of poor, decrepit, indigent persons and lepers, and was dedicated to God and the Blessed Virgin. The endowment consisted of "*all the lands on both sides of the road which heads from Bardsea to Ulverston, and from the great road to Trinkeld to the sea banks, together with the church of Ulverston, and its appurtenances, a salt works between Conishead and Ulverston, and divers others possessions and immunities*" from GENUKI ULVERSTON PARISH_, Lancashire.htm submitted by Collette Lawlor | *c*. 330889,475802; 330460, 475790 | Medieval |
| 6 | Cass 2016 | Possible salt-making site | Probate records from Ulverston Moss suggest a salt-working site | *c*. 330588,477230 | Post-Medieval |
| 7 | Cass 2016; OS 1850 (6 inch), Sheet 16; OS 1895 (6 inch), Sheet 16 | Possible salt-making site, Swarthmoor | Probate records from Rake Lane and Dragley Beck, Swarth Moor suggest a salt-working site. A 'Salt Cotes' is annotated on the 1st edition OS Map (1850). By the next map (1895), it is a Malt Kiln | *c*. 328800,477372 | Post-Medieval |
| 8 | OS Map, 1850 (6 inch), Sheet 16 | Place-Name, Ulverston | 'Salt Coates' in Ulverston is annotated on the 1st edition Ordnance Survey map. It is now located inland as the area has been reclaimed. There is also a Saltcoates Farm | 330458,477357 | Post-Medieval |
| 9 | HER 43154; Healey and Lee 2008 | Possible salt-making site | An earthen mound measuring 20m x 13m in plan may represent the remains of a saltern, Flookburgh | 336407,475310 | Post-Medieval |

| *Asset No.* | *Reference* | *Site Type* | *Description* | *Grid Reference* | *Period* |
|---|---|---|---|---|---|
| 10 | Cass 2016 | Possible salt-making site | Probate records from Lindall, Grange suggest salt-working | *c*. 341888,480306 | Post-Medieval |
| 11 | Place-name; OS 1862 (6 inch), Sheet 46 | Possible salt-making site | Possible salt production by monks at Storth, near Dixies. Salt Cote is labelled on the 1862 Ordnance survey map to the south-west of Dixie Fell Hill. | *c*. 347880,480344 | Medieval |
| 12 | HER 13615; HER 19930; ADS website; PastScape 41509; McIntire 1937, 132; OS 1862 (6 inch), Sheet 46; OS 1913 (25 inch), Sheet 46.6; OS 1952 (1:25,000), Sheet SD 47 | Salt-making site, Arnside | Salt pans in Arnside are recorded in the HER, along with the place-name of Saltcoates. Documentary evidence from the Medieval period also attests to salt works at Arnside, owned by the de Bethum family. The 1st edition OS map (1862) annotates 'Salt Cote' at Arnside just to the north of Red Hills. Several structures appear to be associated with the name. A further 'Salt Cote' is annotated to the north of this one in Beetham. 'Saltcoates' is still annotated on the 1913 OS map. It is no longer annotated by the 1952 map. There is also a Saltcotes Hall at Arnside (HER 19930) | 346078,478760 | Medieval; Post Medieval |
| 13 | Mourholme Local History Society 1998, 143 | Possible salt-making site | Lucas refers to 'Salt Coate Parrock' in Lindeth in the 17th century. Nothing is shown on the OS maps | 346284,473434 | Post Medieval |
| 14 | Place-name; HER 7795; HER 12121; Cass 2016 | Possible salt-making site, Warton | The HER records a rectilinear earthwork at Barrow Scout (323800,47290; HER 7795), perhaps saltpans. HER 12121 records a rectangular earthwork, possibly the same as recorded in HER 7795, measuring 20m by 10m with associated banks (NGR 348037,472907). There is an archived Quarter Session from Lancashire concerning a petition for relief following the destruction of saltcoats by storms by James Dixon and Richard Abram at Warton in 1702 (QSP/875/30) | 348037,472907 | Post Medieval |

| *Asset No.* | *Reference* | *Site Type* | *Description* | *Grid Reference* | *Period* |
|---|---|---|---|---|---|
| 15 | Mourholme Local History Society 1998, 143; OS 1848 (6 inch), Sheet 24; OS 1891 (25 inch), Sheet 24.3; OS 1910 (25 inch), Sheet 24.3; OS 1952 (1: 25,000), Sheet SD47 | Possible salt-making site, Carnforth | Lucas refers to 'Salt Coates' in Carnforth on the west side of Gallihaw, which may be modern-day Galley Hawes. On the OS 1st edition (1848), 'Cote Stones' is annotated by buildings and a 'ruin'. This is located just to the north-west of Galley Hall. 'Cote Stones' are still annotated on the 1910 map and tanks are labelled as part of the structures indicating the continued production of salt. 'Cote Stones' is still extant on the 1952 map also. Salter Flat is one of the field names shown on the 1845 tithe map (Township: Carnforth in Farrer and Brownbill, 1914, 165-170) | *c*. 348846,471221 | Post Medieval |
| 16 | HER 26017 | Salt works, Slyne with Hest | The salt works were referred to in the VCH (Farrer and Brownbill 1914) and the Lancaster Gazette in 1824, but the exact location is unknown | *c*. 346800,466500 | Post-Medieval |
| 17 | Place-name; OS 1895 (6 inch), Sheet 30; OS 1893 (25 inch), Sheet 30.11 | Possible salt-making site, Lancaster | The place-name 'Salt Ayre' in Lancaster is suggestive of salt production, although 'ayre' means gravel bank. This is annotated on the 1st edition OS map (1895) on the north side of the River Lune. However, on the 25 inch map (1893), salt marshes are annotated next to the River Lune, but with no mention of 'salt ayre'. There is no other evidence for salt-working on these maps | *c*. 345645,462108 | Unknown |
| 18 | Cass 2016; HER 19051 | Possible salt-making site, Glasson | The HER records the site of Salt Cote Bow as a set of buildings at Glasson, shown on 1st Edition mapping and mentioned in Leyland's itinerary. Probate records from Salt Coat Brow, Glasson, which is farmhouse dating to 1666 suggest salt-working. It is also shown on the 1st and 2nd editions of the OS maps to the south-east of Glasson Dock | 345405,455952 | Post Medieval |
| 19 | Cass 2016 | Possible salt-making site | Probate records of Christopher Gardner at Bankhouse suggest salt working. Outside of the H2H study area | 343635,452825 | Post Medieval |
| 20 | Cass 2016 | Possible salt-making site | Probate records from Uptowne, near Cockerham suggest salt-working. Outside of the H2H study area | 347114,452691 | Post Medieval |

| *Asset No.* | *Reference* | *Site Type* | *Description* | *Grid Reference* | *Period* |
|---|---|---|---|---|---|
| 21 | Cass 2016 | Possible salt-making site | Probate records from Cockerham suggest salt-working. Outside of the H2H study area | *c*. 346490,452332 | Post Medieval |
| 22 | Cass 2016 | Possible salt-making site | Probate records of the Jacksons at Crimbles suggest salt-working. Outside of the H2H study area | *c*. 345939,450532 | Post Medieval |
| 23 | Cass 2016 | Possible salt-making site | Probate records from Haire Stones suggest salt-working. Outside of the H2H study area | *c*. 345838,449886 | Post Medieval |
| 24 | Cass 2016 | Possible salt-making site | Probate records from Cockerham Marsh suggest salt-working. Outside of the H2H study area | 343431,4512451 | Post-Medieval |
| 25 | Cass 2016; HER 25071 | Possible salt-making site, Wrampoole | Probate records from Wrampoole suggest salt working. George Bradshaw may have built Wrampool/e House and there are two saltcoats near to Wrampool/e House. The HER records an earth bank to the north-west of the Wrampool House, which created a terrace that may have been used for salt processing. Outside of the H2H study area | *c*. 342560,449536 | Post-Medieval |
| 26 | Cass 2016; HER 26293; HER 221; HER 37077 | Possible salt-making sites, Pilling | Probate records from Pilling Moss, Pilling Sandside, Pilling Layne, Lower End suggest salt working. A building, a salt mound and rectilinear pits have all been found in the area that suggesting salt-working. Outside of the H2H study area. Recorded in the HER as Site 195 Pilling Marsh (HER 37077; SD 39595, 50116) which comprises shallow rectangular pits which have been interpreted as mass peat extraction or saltworking | *c*. 340407,448495; HER 221- Lane End Pilling 341625,449240 | Post Medieval |
| 27 | Cass 2016 | Possible salt-making site | Probate records from Fearne Hill, Hackensall, Preesall suggest salt working. Outside of the H2H study area | *c*. 336613,447299 | Post Medieval |

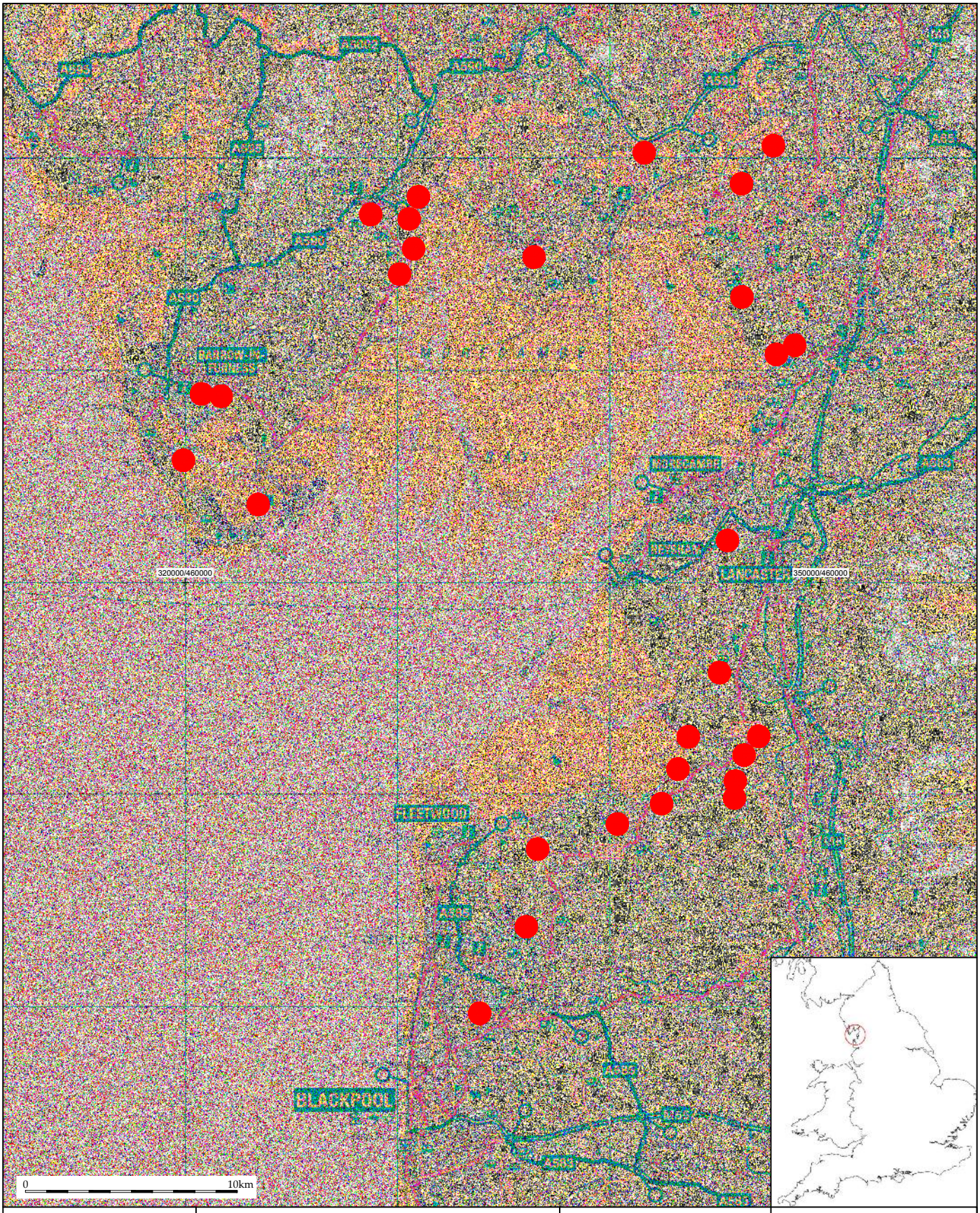
| *Asset No.* | *Reference* | *Site Type* | *Description* | *Grid Reference* | *Period* |
|---|---|---|---|---|---|
| 28 | Cass 2016 | Salt-making site, Stalmine | Probate records from Hambleton Stalmine, Stalmine Grange and Staynall suggest salt working These sites are outside the H2H study area | *c*. 336078,443711 | Post Medieval |
| 29 | Cass 2016 | Possible salt-making site | Probate records from Poulton Homes and Thornton suggest salt working. Outside the H2H study area | *c*. 333900,439740 | Post-Medieval |
| 30 | HER 406 | Cockersand Abbey, Thurnham-possible saltcotes | In the VCH entry for the Parish of Lancaster (Farrer and Brownbill 1914, 4-22) Cockersands Abbey and possibly related saltcotes are mention by Leland the antiquary, who visited the district about 1535–40 who states: *'from Cockersand Abbey I rode over the sands, marking the saltcotes, and a mile off over Conder riveret trilling by the sands to the sea'* | 342700,353760 | Post Medieval at least |
| 31 | HER 2645 | Moss Farm Cockerham-possible salt production pits | The HER lists at Moss House Farm three aerial photographs have revealed a series of linear features, which may be drains or field boundaries, as well as a series of small rectangular pits arranged in rectangular grids. One interpretation of these pits is for possible salt production, however, extraction pits has also been put forward as an interpretation | 343700,449200 | Unknown |
| 32 | HER 3241 | Preesall salt extraction | HER 3241 lists a mineral railway from SD 35735758 to SD 35964704 which is associated with later phases of salt extraction at Presall | 335880, 447260 | Post Medieval/ Modern |

| *Asset No.* | *Reference* | *Site Type* | *Description* | *Grid Reference* | *Period* |
|---|---|---|---|---|---|
| 33 | HER 4280<br><br>Hogarth and Heapy 1980-1, )<br><br>Hogarth 1982-3, 12-20)<br><br>Hogarth 1984-5, 32-37 | Fleetwood salt works | The HER records that Fleetwood salt works were the works for the salt mines at Preesall. The salt works are referred to in the VCH and labelled as Fleetwood Salt Works on the 1st Edition OS mapping (slightly to the north-west of the site listed in the VCH). The site is now demolished/under a waste tip. Associated with HER 4281<br><br>The Fleetwood Salt company was established in 1883 by Joseph Weathered and Charles Thomas of Bristol and F.H. Gossage of Liverpool (and sons) to develop the Preesall salt field. Three generations of the Anderson family went on to work these salt mines. Saltworks were constructed on land at the end of the Burn Naze saltmarsh were purchased from the Lancashire and Yorkshire Railway Company in 1889 which included railway sidings constructed by Preston and Wyre Railway Company which allowed salt to be hauled from the site to the Wyre Dock (Hogarth and Heapy 1980-1, 24). Various infrastructure was put in place and in February 1890 the Fleetwood salt works commenced production.<br><br>Hogarth (1982-3, 17) states that many families from Northwich in Cheshire cam to work the salt and teach the Preesall folk salt mining.<br><br>By 1911 brine and water were being pumped from Preesall to the Fleetwood to the salt works for the production of table salt and common salt and for alkalis (Hogarth 1984-5, 32). Preesall jetty was used to transport rock salt to both national and international trade, including Austrila and South America, with only small-scale salt production in Preesall (ibid) | 333756,444870 | Post Medieval |
| 34 | HER 19207 | Preesall Salt Works | HER records and extensive site, built by Fleetwood Salt Co. and referred to as Preesall Salt Mine, covering.2500 ha and includes salt works, pumping station, mineral railway. The site was connected by pipelines to a spread of brine wells. | 336055,446625 | Modern |

| *Asset No.* | *Reference* | *Site Type* | *Description* | *Grid Reference* | *Period* |
|---|---|---|---|---|---|
| | Hogarth and Heapy 1980-1, )<br><br>Hogarth 1982-3, 12-20)<br><br>Hogarth 1984-5, 32-37)<br><br>Hogarth and Binns 1986-7, 31-47)<br><br>http://www.blackpoolgazette.co.uk/lifestyle/nostalgia/almost-forgotten-story-of-preesall-s-salty-past-1-7415678<br><br>Landless, 1979, 37-43) | | Site opened in 1902 and closed *c*.1925.<br><br>An overview of this site is presented in The Over-Wyre Historical Journal Vols. 1- and is summarised below.<br><br>During 1872, a syndicate of men from Barrow struck a bed of rock salt about half a mile to the south-west of Preesall village whilst searching for iron ore. Further exploration in the 1870s revealed layers of salt and 'enormous supplies of fresh water' trapped in geological faults. The water supply and its proximity to the rock salt was advantageous to brine production (Hogarth and Heapy 1980-1, 23). | | |
| 35 | HER 24431 | Salt Warehouse | The HER records a salt warehouse marked on historic maps of the docks in 1863/1871 | 333872,447672 | Post Medieval |

| *Asset No.* | *Reference* | *Site Type* | *Description* | *Grid Reference* | *Period* |
|---|---|---|---|---|---|
| 36 | HER 35193; Cass 2016<br>Hatton 1980-81, 22-3 | Possible salt production site | The HER records a site at Storey's Grange that operated from the 15th century through to *c*. 1715. There were probably two Saltcotes leased from landowners.<br>A salt production site has been identified at Hambleton dating from the 15th to the 17th centuries and was produced on the salt marsh opposite Storey's Grange (Hatton 1980-1, 22). Salt could only be produced in the dry weather, however records show that the summer of 1629 was so wet that very little salt and hay could be harvested that year (ibid). Hatton indicates that the saltcoats in Hambleton were located on slightly higher ground along the Shard Lane side of the salt marsh, and probably numbered no more than two (1980-81,22). Following drying of the salt- the salt would be sold locally at Preston Metts (Hatton 1981-1, 23). By the beginning of the 18th century the industry in Hambleton was falling in decline and a storm in 1720 washed most traces away, however, small quantities were probably still made by villages for their own use until the end of the 18th century (ibid). | 333671, 44205 | Post Medieval |
| 37 | | Possible salt production site | Salt Cote Wood, near Meathop<br>Area named after possible salt making industry – the wood slopes down to salt marsh on older maps<br>Current maps and Google Earth indicate land has been reclaimed for agriculture and no longer classified as marsh- Collette Lawlor.<br>On the LDNP HER the site of Saltcote pump at SD 441803 (a pump probably used to pump water from the low lying land beside the adjacent high banked drain). LM name of site suggests Salt Cote in this area. See: http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=2888169&resourceID=801 | 344300,480200 | Unknown; ? Post Medieval |

# APPENDIX 2: FIGURES




| | |
|---|---|
| PROJECT: | The Morecambe Bay Salt Industry |
| CLIENT: | Morecambe Bay Partnership |
| SCALE: | 1:250,000 at A4 |
| DRAWN BY: | AB |
| CHECKED BY: | AB |
| DATE: | June 2017 |
| REPORT No: | CP11586 |

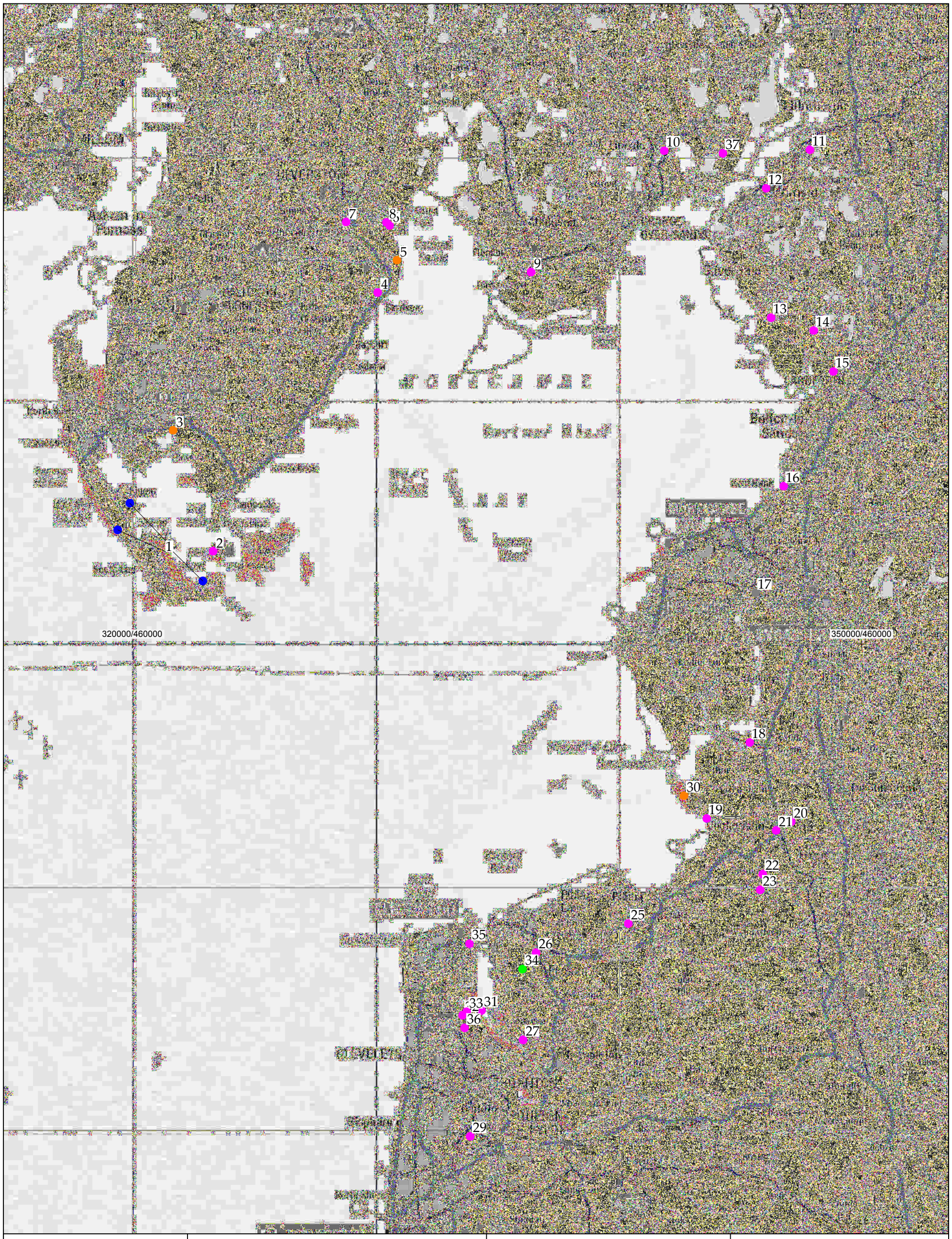
KEY:

Locations of saltmaking sites

Wardell Armstrong 2017



Figure 1: Sites' location.




Wardell Armstrong
2017

| | |
|---|---|
| PROJECT: | The Morecambe Bay Salt Industry |
| CLIENT: | Morecambe Bay Partnership |
| SCALE: | 1:150,000 at A3 |
| DRAWN BY: | AB |
| CHECKED BY: | AB |
| DATE: | June 2017 |
| REPORT No: | CP11586 |

KEY:

- Medieval
- Post-medieval
- Industrial
- Modern
- Unknown



Figure 2: Location of heritage assets.

wardell-armstrong.com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