10.0 Appendix for Chapter 2.0

Research Methodology

This appendix provides detailed information about the methodology used in this research project and can be read in conjunction with the main text in Chapter **2.0**.

Table 10.0.1 Research Methodology Design Factors

Research Framework	Desk-Based Assessment
	Briquetage Assessment
	Fieldwork
	Creating and recording the dataset using new definitions within a database
	Site Gazetteer

Desk-Based Assessment

The desk-based research has formed the bulk of work needed to complete this research. It provided the best technique to collate and interpret data over a large study area. As many sources as possible have been used to retrieve information. This includes general background research on the Iron Age and Romano-British period within the study area, as well as literature on the coastal and environmental nature of the sites. The desk-based research also includes a thorough review of journal articles, monographs and published material. A significant amount of information was also collected from datasets and archives of 'grey literature', (archaeological contractor client reports and unpublished site archives). Grey literature data was kindly provided by the study area county or unitary authority Historic Environment Record, as well as the English Heritage/Bournemouth University jointly managed 'Archaeological Investigations Project'.

Museum and other archives were also consulted. Where needed, archaeological contractors were also contacted, as well as local archaeological societies based within the study area.

Briquetage Assessment

As has already been discussed, briquetage data forms the main artefact component of this research project, alongside archaeological feature data. This material was the only material culture evidence considered in detail, as it

dominates these sites, whereas other types of artefactual and ecofactual evidence, although recorded in the database and included in discussion where possible, formed a very small component of the overall archaeological dataset. Therefore this general lack of recorded evidence for other forms of evidence such as this, meant that there was little scope for the consideration of for example, faunal and environmental evidence.

The briquetage data was recorded using published and unpublished sources (including archives). In some cases, further information was obtained from museum or private site archives. This involved handling briquetage collections and compiling a photographic record of key forms and, in some cases, illustrating forms.

This research relies on comparative analysis of briquetage forms and the presence/absence of forms, as opposed to quantified data such as weight. This material is often extremely fragmented and heavy, making it difficult to quantify and store. It is also difficult to fully excavate large briquetage deposits due to the large amount of fragments spread over an area. As described in **1.0**, briquetage acts as an 'umbrella' term, and includes various clay forms but is often recorded only generically and briefly at the end of an archaeological report. This can often result in little information being recorded other than a few comments about form. It is less common to have the briquetage quantified by fragment counts, fabric records and weight. This is due to many logistical factors including in some cases, much of the material being left in-situ due to excavation limitations and storage issues. These factors have raised many issues when considering the best way to record briquetage within this research project. This is further discussed in detail later in this chapter.

Fieldwork: An Overview (Table 10.0.2)

This research project was designed to be primarily desk-based with a provision for visiting selected briquetage collections. However, during this research, it became clear that the Somerset Levels contained over 90 potential salt-production sites.

Very few of these sites have been explored compared to other regions. This area was considered to have great potential for informing about the scale and

technology of salt-production and therefore it was decided to carry out a small amount of archaeological fieldwork.

The aim of this fieldwork was to explore further the potential production of salt within the Somerset Levels, focusing on the debris mounds. The formation of an appropriate methodology with defined aims and objectives was discussed in detail with Richard Brunning, Somerset Moors and Levels Archaeologist at Somerset County Council. It was agreed that geophysical survey and targeted small-scale excavation of potential salt-production sites, informed by the survey results would be the most appropriate (Figure 2.1).

Table 10.0.2 Fieldwork components and individuals involved in each process

Fieldwork Component			Individual/s involved in fieldwork process
Geophysical Survey	**Gradiometer Surveying**		SCEP/Author
	Data processing		SCEP
Excavation	**Test-Pits**		Author/SCEP/Youth Group
	Rescue		Author/SCEP/Youth Group
	Coring		SCEP
Post-Excavation	**Briquetage**		Author
	Ceramics		
	Soil and Briquetage Samples	Preliminary Processing and identification (i.e washing, drying, general sieving, sorting)	Geoflo (a professional component of SCEP)
		Detailed processing and identification (i.e detailed seiving species/seed type etc)	Deborah Costen (Bournemouth University Staff)

Full discussion of the fieldwork methodology, including ethical considerations, land use and overall suitability can be found in Appendix **10.4.** The fieldwork results are discussed in Chapter **6.0**.

Site Visits

To provide a better understanding of the wider landscape and topographical context of the sites, a number of sites across the whole study area were visited. This was a very flexible and unsystematic process which was mainly instigated by the personal need to get 'a feel' for the areas in which these sites are recorded.

However field record sheets, measuring tapes, and a hand-held GPS were always taken in case any associated archaeological features were observed, including briquetage scatters.

Site Information Database

An MsAccess database has been specifically created for this research; this forms the core of all data storage and allows for efficient data management. It has been designed to incorporate all site information according to the research objectives.

The database contains a series individual tables designed to contain specific information about each site and these are outlined next.

Database Table 1: Main Site Information (Table 10.0.3)

The first and main table is called the 'Main Site Information Table' and this contains basic information for each site (Table 10.0.3). This Main Table also generates a unique Site ID number for every site and this unique number then links all the other subsequent data tables together.

Table 10.0.3 Main Site Information Database Table (Database Table 1)

Database Table 1		
Category	**Category Description**	
Site ID	Unique sequential Site ID number	
HER Site ID	Site ID as assigned by local Historic Environment Record	
Site Name	Site Name	
County	Site Location in Britain according to modern county boundaries	
Region	Region of Southern Britain	South West
		South East
Site Code	Site code as assigned by archaeological contractor/excavator	
SAM No	Scheduled Ancient Monument number	
Height OD	Height above sea level	
Total area	Total area covered by site (e.g square metres)	
Landscape visibility	Is the site visible in the landscape?	Yes
		No
Excavated	Was the site excavated?	Yes
		No
Briquetage	Was there briquetage present?	Yes
		No
Features	Were there relevant archaeological features present?	Yes
		No
Other production	Is there evidence for other production processes taking place?	Yes
		No

processes		Production Process
Domestic activity	Is there general debris indicative of general human site occupation present?	Yes
		No
Finds located	Can the original site artefacts be accessed/is the location of the archive known?	Yes
		No
Archive located	Is the main location of site archive known?	Yes
		No
Fieldwork potential	Does the site have potential for fieldwork?	Yes
		No
Site Status	A general guide for the state of the site	High Risk
		Moderate Risk
		Low Risk
Site Visit	Has the site been visited as part of this research?	Yes
		No
Site Type	Site Type according to the archaeological evidence (briquetage/feature presence)	Actual Site
		Briquetage Site Only
		Mound Associated Briquetage Only
		Mound Only
		Mound Group
		Unknown
Summary	Brief overview and summary of the site	

After this stage of data entry, information was entered into subsequent tables and these are listed in Table 10.0.4.

Table 10.0.4 Subsequent Site Database Tables (Database Tables 2-13)

Database Table	Table No.	Description	
XY	2	Site Grid Coordinates	NGR
			Easting and Northing
			Grid Ref checked?
Source	3	Literature source/reference with unique sequential **Source ID number**	
		Site Terminology	
		Archaeological Investigation Type	
Designation	4	Site Designation	
Geology	5	Superficial Geology	
Topography	6	Site Topography	
Site Date	7	Site Date/Period	Earliest Date
			Latest Date
			Actual Date
			Dating Type
		Dating Type	Form of dating used
Features	8	**'Original Feature Data'**- Information as originally recorded with unique	Feature Label
			Dimensions

		sequential **Feature ID number**	Date
			Notes/Summary
		'General Feature Type'- Re-interpreted 'Umbrella' feature type as newly defined by this research project`	Confidence Rating
		'Detailed Feature Type'- Re-interpreted 'Detailed' feature type (sub-heading under 'General Feature Type' as newly defined by this research project	
Briquetage	9	**'Original Briquetage Data'**- Briquetage information as originally recorded with unique sequential **Briquetage ID number**	Form
			General Quantities
			Original Terminology
			Notes/Summary
		'General Briquetage Type'- Re-interpreted briquetage type as newly defined by this research project`	Form (Presence Only)
			Dimension
Fuel	10	Fuel Type	Evidence
			Notes
Notes	11	Notes made on the original source data	
Site Visit	12	Record of site visits carried out by author	
Gazetteer Summary	13	The complete site summary created for this research project to be used in the new site gazetteer	

An overview of the main database tables listed above is provided below.

Database Table 2: Site Grid Reference

Site grid references were recorded in two forms (where given), using the format of the National Grid (NGR) which involves a unique area two letter code, usually followed by a four, six or eight grid number. 'Eastings and Northings' were also recorded, specifically to be used in conjunction with mapping software to allow for the formulation of site distribution maps. Specialised ArcGIS software was used to create site location and distribution maps to provide a visual overview of location, as well as to aid discussion of the sites within specific areas.

Database Table 3: Source

All sources providing data for each site were individually recorded and given a unique, sequential Source ID number. These numbers were then recorded in

Endnote; a referencing software used for this thesis. This allowed for an efficient system of cross referencing when needed. Site archive locations were also recorded within this table where known.

Database Table 3a: Site Terminology

The original Site Terminology used in references/sources is also recorded with the Source Table.

There are a variety of different terms used to describe and record archaeological sites, such as 'settlement', 'pottery production site' and 'building'. In order to provide a more consistent system of archaeological site terms, the 'National Monument Thesaurus (English Heritage, 2006), was created. This provides a comprehensive guide, listing all the 'official' terminology that can be used to describe and record sites in the archaeological record. Tables 10.0.4-10.0.5 contain English Heritage (2006) suggested terminology for the recording of sites that have an association with producing salt:

Table 10.0.5 National Monument Thesaurus suggested Class Terminology

NMR Class Terminology		
	Top End Class	Industrial
	Middle Class	Mineral Extraction
	Base Industry	Salt-production Site

However, despite these suggested terms, there is little evidence that they were used to record sites in the archaeological record. As a result, there were a variety of terms used to define areas of salt-production in literature. However, this is partly due to the fact that these suggested terms are still very generic and can be confusing, especially as they are not necessarily period specific or sensitive to different chronological technologies.

Table 10.0.6 Sub-categories of 'SALT PRODUCTION SITE' (Table 2.7) as determined by the National Monument Thesaurus (English Heritage, 2006)

Term	Description
PAN HOUSE	A Boiling House associated with a **SALT WORKS**: A component of a salt works housing iron pans where the brine was evaporated above a furnace and flue. Such houses were lightly built in order to allow the heat and steam to escape.

SALT WORKS	A general term of place, building or factory where salt is produced.	Used for:	Salt Evaporation Tank Salt workings Saltings
SALTERN	A building in which salt is obtained by boiling and evaporating salt brine or seawater in large pans.	Used for:	Red Hill Salt Mound Salt Pan Saltcote
STOVE HOUSE	A Hot House: A component of salt works containing flues and drying areas where salt blocks are dried before being crushed and bagged.		

For example, the two terms ‘Salt Works’ and ‘Saltern’ are often used in different ways to describe different sites and this can cause confusion. Gilman *et al* (1998) addressed this issue and clearly stated which terms they were using and why:

> The term "saltern" is used here to refer to the complex of features involved in the extraction of salt from brine by evaporation. This is a synonym for the terms used by other writers such as "salt works", which itself is more applicable to industrial plants of the 17th and later centuries or others even less precise.
> (Gilman *et al.*, 1998: 2)

In order to explore the issue of different and inconsistent terminologies, during data entry for this research project, common site terminology was recorded (Table 10.0.7). Any other terms are recorded separately under ‘Other’ and listed as originally stated (for example ‘Salt-Exploitation Site’).

New recommended site terminology designed during this research project will be recommended at the end of this thesis.

Table 10.0.7 Main site terminology used for salt producing sites within archaeological literature

Site Terminology
Saltern
Salt-Boiling Site
Salt-Extraction Site
Salt-Pan
Salt-Production Site
Salt-Working Site
Salt Works
Salt-Making Site
Salt-Manufacturing Site
Salt-Panning Site
Salt-Winning Site

Database Table 3b: Archaeological Investigation Type

There are a various types of archaeological investigation available to assess and record sites. These range from non-invasive work such as desk based research and fieldwalking surveys to identify surface finds to invasive excavation.

This research project heavily relies upon archaeological literature, reports and records to discover information about salt-production sites. The reliability of this information, as well as the level of detail, will greatly depend on the type of archaeological methods used originally to assess the site. These sites are often subject to several stages of recording and it is important to trace a site's archaeological discovery and subsequent history.

The database has a pre-defined list of the most commonly used archaeological investigation types and these are listed in Table 10.0.8. Whether the investigations were invasive or non-invasive was also recorded.

The reason for carrying out any formal archaeological investigation was also recorded in order to inform on any trends in the way in which these sites have been approached (Table 10.0.9).

Table 10.0.8 Common archaeological investigation techniques

Archaeological Investigation Type		
Desk Based Assessment		
Excavation (details unknown)		
Field Observation		
Field Observation of non-archaeological groundworks/ Watching Brief		
Fieldwalking Survey		
Geophysical Survey	Positive?	
	Yes	No
Open Area Excavation		
Research Excavation		
Test-Pit Excavation		
Trench Excavation		
Walkover Survey		

Table 10.0.9 Main reason for completing an archaeological investigation

Reason for Archaeological Investigation
English Heritage Survey
Other
PPG16
Rescue
Research

Database Table 4: Site Designation

The Site Designation Table contains information on any site specific designations, such as Sites of Special Scientific Interest (SSSI) and sites that are Scheduled Ancient Monuments (SAM). This was recorded to inform on any restrictions to site access or future investigation.

Database Tables 5-6: Geology and Topography

Geology and Topography were recorded where known to provide a better understanding of the site in the context of the landscape as a whole. A pre-defined list of topography types was available within the site database (Table 10.0.10)

Table 10.0.10 Pre-determined topography types within the site database

Topography Type
Bay
Built Over
Cliff
Estuary
General Coast
Inland Findspot
Intertidal
Marsh
Reclaimed Land
Shore
Unknown

Database Table 7: Site Chronology

This table contains the dating information for each site and is subdivided into four parts (Table 10.0.11).

Table 10.0.11 Information recorded in the Site Date Table within the Site Database

Site Date	Earliest Date
	Latest Date
	Actual Date
	Dating Type

Most of the dates given for sites in the study area are in the general form of 'Early Iron Age' or 'Late Roman'. Sometimes more than one possible date is given, or the site may continue over more than one period. Therefore the earliest and latest possible date for the site was recorded. Where known, the actual date was also recorded, for example '200 BC.' or '2nd Century AD'. Finally, the form of dating was recorded, for example 'artefacts'; this is in order to ascertain the accuracy of the date given.

Some of these sites were recorded many years ago and the period term original used, may have changed. This is particularly true of the Iron Age (for example, the Iron Age A,B,C system) so where possible, the dates have been converted so that they are a consistently recorded within the database.

A Note about Dating

Dating salt-production sites can be notoriously difficult. There is often very little if any evidence for domestic debris such as pottery on many sites. There is not as yet, a definitive briquetage typology/sequence for dating sites. Some sites have been subject to absolute dating, but many are still only loosely dated based upon their similarity to other sites. An example of this can be seen in a salt-production site excavated in Lincolnshire ahead of a road scheme:

> In conclusion, the assemblage is likely to be of local origin…However, it is impossible to say exactly when salt production took place. The lack of pottery makes dating difficult, although it is likely that the material is Roman.
> (Fletcher, 2004: 78)

Dating most archaeological sites, including salt-production sites, often depends on relative dating. This depends on the presence of artefacts such as pottery and coins that are contained within the same strata as the evidence for salt-production. Even where pottery is present, it can often still be difficult to accurately date unless there are diagnostic sherds.

Another form of this dating relies on stratigraphy. This can at least help to narrow the date somewhat, for example if an early medieval occupation layer lay directly above a salt-production site of unknown date, we could say that it was pre-medieval in date.

Absolute dating has been less used, mainly due to expense. Dating features such as hearths using radiocarbon dating on charcoal, can also prove difficult, especially if the features date to the Iron Age. This is because of a 'wiggle' in the calibration curve within the period 800BC-400BC which means C14 samples taken from features dating to this period will be subject to a wide range of dates. However C14 dating, used in conjunction with another dating technique, such as artefact typology or magnetic inclination dating can help strengthen the result.
One absolute dating technique which has been used on a few sites is the measuring of preserved magnetic inclination within clay. The potential of using this technique to date Iron Age hearth material and briquetage has been outlined by Borradaile *et al*., (1999). The principle of this technique is that when a briquetage container or hearth lining is heated, the material acquires a particular magnetic force; an ‘inclination’ that matches the magnetic inclination of the earth at that particular time. This inclination can then be measured as it represents the earth’s magnetic field, which is constantly changing over time. Thus by measuring the degree of inclination preserved within the clay material, and matching it to the magnetic variation curve, a date of the last heating or firing episode can be obtained. This method of dating is particularly useful if there is no other form of dateable artefact evidence in a site.

This technique was used to date a hearth associated with a salt-production site at Peldon, Essex (De Brisay, 1978: 57-58), where the dates were placed between 10BC and AD40. This was used in conjunction with C14 dating of charcoal found within the hearth, which produced a date of between 60BC and AD130. An overall average date of between AD15-24 was given. However this technique does rely on material being *in-situ* so cannot be used where the feature/briquetage had been disturbed. This was found to be the case for eighteen archaeomagnetic samples taken from a salt-production hearth recorded at Cowbit Wash, Lincolnshire.

> When plotted, the natural remanent magnetisation of the samples formed a broad scatter with little indication of any clustering. This confirmed that the feature had

been disturbed since it was last fired, rendering it undatable by conventional archaeomagnetic analysis. (Lane and Morris, 2001: 90)

The technique used to date these sites is an important consideration when making site interpretations which incorporate chronological comparisons. Therefore the dating technique/s used for each site has been recorded in order to assess the certainty of the overall date assigned to each individual site (Table 10.0.12).

Table 10.0.12 Site Dating Method

Site Dating Method
Artefacts
Stratigraphy
Site Typology
Absolute Dating
Unknown

Database Table 8 (8a-c): Archaeological Features

All individual features thought to be associated with salt-production on each site were recorded in three related tables (Figure 10.0.1).

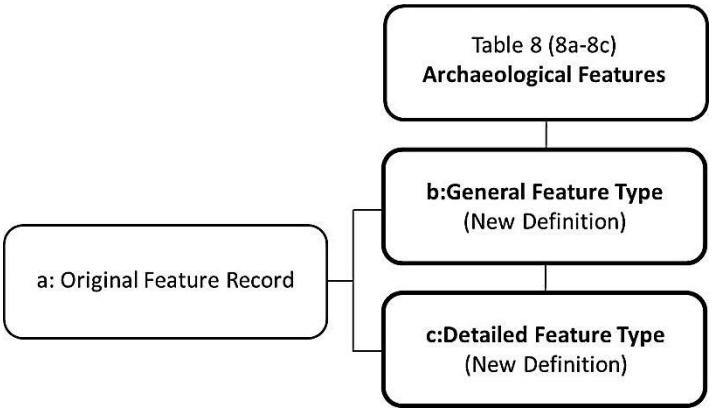

Figure 10.0.1 Archaeological feature recording process/relationships in the database

This involved recording the data as it was collected originally (Table 8a), assigning unique Feature ID numbers (shared by all tables) and then re-defining each feature according to pre-defined categories set by this research project. These new definitions are presented further in the main text (**2.2**), (Table 2.4).

Database Table 9 (9a-b): Briquetage

All known briquetage information was recorded within two related tables on a similar basis as above (Figure 10.0.2). The original briquetage data was recorded, a Briquetage ID was assigned (shared by both tables) and then diagnostic briquetage forms were recorded according to newly designed definitions created for this research project. These new definitions are presented further in the main text (**2.2),** (Table 2.5).

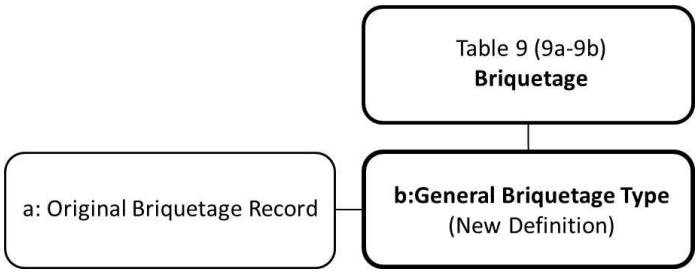

Figure 10.0.2 Briquetage recording process/relationships in the database

Database Table 12: Site Visit

This table records any details of site visits made by the author as part of this research. It also records general field observations such as the visual state of the site and the presence of any material culture or archaeological features.

Database Table 13: Site Gazetteer Summary

This table contains the final site summary to be used within the Site Gazetteer. This gazetteer is provided digitally within the back of Volume Two, and contains a list of all the sites with the main sources and a summary.