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If Pits Could Talk: An Analysis of Features from the Figura Site (AgHk-52)

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Abstract

This thesis examines the features and spatial patterning of features across the Figura site (AgHk-52), a Late Woodland, Younge Phase Western Basin site, dating to the 13th century AD. The features from this site were analyzed to gain insight into these unique contexts and how they can, in turn, advance our understanding of life at the Figura site. Given the clean and ordered settlement pattern of the site, the spatial relationships of features to other settlement patterns – such as residential and non-residential areas, inside and outside the palisade – could be analyzed. The site was divided into defined residential and non-residential areas based on concentrations of features and/or structures. Specific feature attributes of depth, volume, feature stratigraphy and artifact content were used to determine if patterns could be identified from the features at this site, and specifically if residential and non-residential areas can be distinguished from each other. The findings of this thesis demonstrate that cultural features, when pit characteristics are considered in context, represent individual moments of daily living across a community that help reveal spatial tendencies built up over the life of the site. The findings drawn from Figura also offer us real insight into understanding settlement and spatial patterning at other Western Basin sites where large numbers of these features have been documented, but lack other settlement patterns.

Keywords

Western Basin Tradition, Late Woodland, Younge Phase, features, feature analysis, spatial analysis, settlement patterns

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Table of Contents

List of Tables

List of Figures

List of Appendices

Chapter 1

1 Introduction

Archaeological sites consist of many different types of material and remains of human occupation and the contexts they are found in, and they all work together to help inform us about past populations. Some things, such as artifacts, receive the bulk of the analysis while others, such as features, are often ignored or only briefly mentioned in analysis. However, beyond being units of context for understanding artifacts, features are material things themselves, created for a diverse array of needs and intents. As such, features as a product of human action embodying choice, tradition, use and forgetting, can provide valuable intra-site information about human activities across a site and should also be studied in detail.

Cultural features are subsurface depressions or holes intentionally or unintentionally dug into the ground by people for various uses, such as cooking, storage, waste disposal, burial or structural needs. These features vary in size, shape and function. Features will be discussed in more detail in Chapter 2.

Cultural features are one of the most abundant contextual units found on Late Woodland sites in southern Ontario, yet they are rarely the focus of study. The majority of artifacts from Late Woodland sites are found in features, especially when sites are subject to topsoil stripping, as is the case with current Cultural Resource Management (CRM) archaeological practices in Ontario (Government of Ontario 2011). The contents of features are the main focus of research, often with little regards to the context in which they were located. Some authors (e.g., Cunningham 1999, 2001; Mather 2015; Timmins 1997) have taken feature types or feature clusters into account in their analysis of cultural material. While analyzing individual features is not feasible for all studies, features should at least be taken into account beyond simple contextual markers when studying artifacts that were excavated from features, as that could provide valuable insights into the archaeology of the locale being investigated.

Features can be defined as nonportable physical depositions containing remains of cultural behavior (Shott 1987:360). Features were dug for a specific purpose, used and then filled in by one or many depositions (Moeller 1992:8). Features, or even strata, lenses, or feature sections, are the primary contextual units from which much Late Woodland archaeological data can be recovered. A small scale analysis of individual features or intra feature contexts offer a different scale of analysis than simply lumping the contents of all features together by artifact class or other larger categorization. Studying individual features can allow archaeologists infer particular behavior or events at and across a site (e.g., Binford 1967; Dunham 2000; Harris 2009; Mitchell 2008; Sweeney 2010), detailed analysis about the formation of a site (e.g., Cunningham 1999, 2001; Timmins 1997), and post-use infilling processes of those features. This can ultimately inform us about the people that created those features. This thesis will try to do that: study the features from one site to gain a better understanding of the functions and intents behind the use of features across the site, and to also gain insight into the social organization of the site.

1.1 How and Why Features are Studied

Most cultural features were created for specific reasons and purposes, and thus have an intentionality that serves to provide insight into activities that happened in and around the pit (Moeller 1992:20; Stewart 1975:17). As well, each feature encompasses a single or series of distinct events. For example, Sweeney (2010) analyzed a single feature from the Dorchester site, an Early Ontario Iroquoian village located on the Thames River east of London. This feature contained two masses of animal bone: one being an abundance of cranial material, including two bear skulls placed facing each other, the other containing an abundance of juvenile black bear skeletal material. Due to this unique placement of bear crania, and the abundance of juvenile bears, this feature was interpreted to have a ritual function.

Features also encompass a distinctive spatiality across a site, i.e., a particular feature or type of feature was excavated and used for a particular purpose needed at a distinct location. Choice, physical and mental constraints will all play a part in determining why a particular feature was located where it was. The location of certain types of pits (e.g., storage pits, refuse pits, hearths) can inform archaeologists of the use of space at a site, and the location of certain types of pits (or similar pits appearing at distinct locales across a site) can also help us infer social relations across a site. Some authors (e.g., Hart 1993, 1995) have interpreted storage pits or storage structures found within or immediately adjacent to a house to be the “property” of the houses’ inhabitants, where access to the storage facility is limited to specific people (i.e., the occupants of that structure). Hart (1993:95) looked at Monongahela storage facilities, which consist of long, shallow pits surrounded by post molds which would have been attached to houses. He argued that these storage facilities reflect how storage was managed and controlled at that time, i.e., at the household level (Hart 1993:9; 1995:50).

The basic content of features, including what is and what is not in a feature or group of features, can help interpret function and site formation (e.g., Timmins 1997; Cunningham 1999). For example, cross mends of the same ceramic vessel found in different features can indicate that the features were open and in use at the same time, as well as serve as suggestive evidence of possible social relationships across a site (Cunningham 1999:33; Moeller 1992:43; Timmins 1997). Timmins (1997:71-87) used ceramic cross mends, along with overlapping features and structures, to determine the occupational history of the Calvert site, which consisted of three phases. Cunningham (1999), following Timmins (1997), also used cross mends to infer the occupation history of the Van Bree site, which he felt contained both Early Ontario Iroquoian and Western Basin Younge Phase cultural materials across the site.

Despite their potential for fine grained insight into daily life across a site, features also pose challenges. For example, feature morphology can be a better indicator of primary function than artifact content (DeBoer 1988; Dickens 1985; Green and Sullivan 1997:2; Stewart 1975:26), since contents of features can often represent a secondary deposit added *after* the primary function of the feature has passed, by later occupations, or even after occupation (e.g., Dickens 1985:35; Green and Sullivan 1997:2; Stewart 1975:26).

1.2 The Figura Site (AgHk-52)

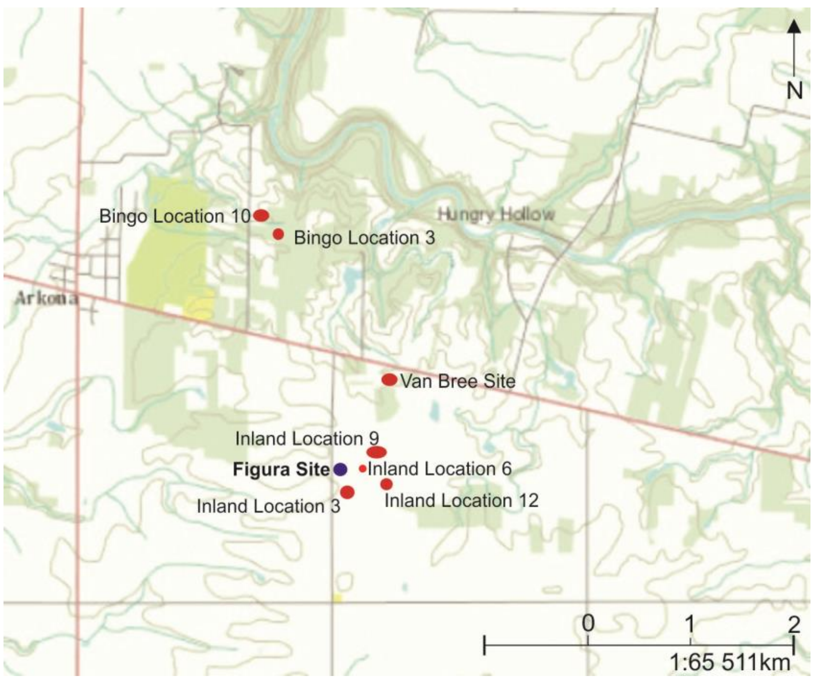
For this thesis I will be analyzing the features that were documented at the Figura site. This site, also known as Inland Aggregate Pit Location 1 and as the Glyph site, is located near Arkona, Ontario and is thought to be associated with the Western Basin Tradition, Younge phase, in an area of southwestern Ontario thought to represent the easterly extent of Western Basin archaeology at that time (Ferris and Wilson 2010). This is one of a series of sites all dating to the same period and investigated by Wilson's CRM Firm Archaeologix Inc. (now part of Golder Associates Ltd.) within a three kilometer area as part of a large scale assessment and mitigation project tied to local aggregate extraction (Figure 1 and 2; Archaeologix Inc. 2007a, b). For Ferris and Wilson (2010), this cluster of sites sits at what they referred to as an archaeological material "borderland" between Late Woodland traditions in southwestern Ontario in the thirteenth century: Ontario Iroquoian to the east, and Western Basin to the west. They argued that there could be heightened material and residential innovation in this borderland, as people negotiated tradition and innovation, and the external influences of neighbouring communities. Certainly, excavations of several of the Arkona cluster of sites have revealed distinctive settlement patterns and a ceramic expression that is either a distinct regional variant of Western Basin ceramic traditions, an incoherent ceramic expression, or a local artisan community innovating tradition through ceramic innovation arising from being along this borderland (Cunningham 2001; Suko 2017; Watts 2006).

The Figura site was excavated in the spring of 2008 (Golder 2012). Following limited one meter hand excavations on the site, the remaining area was stripped using an excavator with a straight edged ditching bucket to expose the underlying settlement pattern. The stripped surface was shovel shined and features were photographed, mapped and excavated. Features were cross-sectioned and excavated as one unit, not layer by layer. A cross-section drawing is available for all features uncovered during the excavation (Golder 2012).

Golder Associates Ltd. turned over collections and provided access to field records to Dr. Neal Ferris as part of his SSHRC research funded project exploring the Arkona cluster of sites on this material borderland. This included providing Ferris with soil samples that were recovered from features for the purposes of soil flotation. These were processed at the Museum of Ontario Archaeology in 2009 and 2010, in part by the author.

Figure 1: Location of the Figura Site within Southern Ontario

Figure 2: Arkona Cluster of Sites



1.2.1 Dating the Site

Ferris selected a number of features to be subjected to radiocarbon dating (AMS- Beta labs) based on the presence of diagnostic ceramic vessels and plant material. Where possible, fragments of maize kernels were used to date the features. The results of the radiocarbon dates obtained for Figura are presented in Table 1.

Based on these dates and the material culture present, especially the ceramic and pipe assemblage, the Figura site appears to be associated with the late Younge Phase of the Western Basin Tradition, falling mostly within the late 12th and 13th centuries AD.

Table 1: Figura Site Radiocarbon Dates

Sample Number	Feature Number	Measured Age	2 Sigma Calibration	Conventional Radiocarbon Age	Beta Number
A8/I1/102	F. 102	950 +/- 30 BP	Cal AD 1010 to 1160 (Cal BP 940 to 800)	970 +/- 30 BP	293274
A7/I1/63	F. 63	830+/- 30 BP	Cal AD 1160 to 1260 (Cal 790 to 690)	850 +/-30 BP	293273
A9/I1/24	F. 24	580 +/- 30 BP	Cal 1160 to 1260 (Cal 800 to 700)	840 +/- 30 BP	293275
A5/I1/55	F. 55	530 +/- 30 BP	Cal AD 1200 to 1270 (Cal BP 750 to 680)	800 +/- 30 BP	293272
A4/I1/24	F. 24	520 +/- 30 BP	Cal 1210 to 1280 (Cal BP 740 to 670)	780 +/- 30 BP	293271
F0001	F. 65	540 +/- 30 BP	Cal AD 1165 to 1270 (Cal BP 785 to 680)	810 +/- 30 BP	416896
F0002	F. 94	490 +/- 30 BP	Cal AD 1220 to 1285 (Cal BP 785 to 680)	760 +/- 30 BP	416897

1.2.2 Settlement Patterns

The Figura site was approximately 80 by 60 meters in area, based on recorded settlement data. It revealed a distinctive settlement pattern to what had been documented previously for the

Western Basin in southwestern Ontario from this period. Notably, excavations at Figura revealed five small, “wigwam-shaped” houses, four of which were located inside a single row of palisade. The fifth house is located immediately to the southwest and outside of the palisade, along with a number of cultural features. There also appears to be an open “plaza-like” area inside the palisade, which consists of many features. There are few, if any, overlapping features or houses at the site, suggesting a brief, continuous use of the site without rebuilding or modification. Palisade or surround walls had been noted for other early Late Woodland sites in southwestern Ontario, including at Van Bemmel (Ferris 1989), Roffelsen (Grant 2016), and possibly Dymock (Fox 1982a). Likewise, small wigwam-like house structures had been noted for Cherry Lane (Ferris 1990), and Silverman (N. Ferris, personal communication 2016). Nonetheless the formal, community-based settlement pattern seen at Figura of multiple houses, ordered in space and oriented along a palisade, remains unique. Figure 3 provides an illustration of the Figura site, provided by Golder but modified by the author (Golder 2012).

Given this relatively clean settlement pattern (i.e., lacking overlapping structures and features), a consideration of the features across this site affords a relatively unique opportunity to explore the social dimensions and uses of features, freed from masking overlaps of occupation and differing uses during the duration of occupation.

In addition to the 297 cultural features from the site (inside palisade n=196, outside palisade n=101), there are three middens, one inside the palisade to the south of House 1, while the other two are located outside of the palisade.

1.3 Research Objectives

The Figura site is a large, single occupation site. As this site is large, with a relatively non-complex settlement pattern, it provides an opportunity to analyze features from this site in a clear manner.

The objective of this thesis is to analyze the features from the Figura site to gain insight into these unique contexts and how they relate to the occupation of this site, as well as offer new insights into this unit of analysis on Late Woodland archaeological sites in the Great Lakes region.

Chapter two provides a contextual background for this study, including an overview of the culture history of the early Late Woodland period, and an overview of features in the Great Lakes. Chapter three outlines and discusses the methodology used in this study. Chapter four consists of the analysis of features, artifacts and spatial patterning of features and artifacts at the site and presents the results of the analysis performed in chapter four. Chapter five concludes the study and suggests further research.

Figure 3: Figura Site Map

Chapter 2

2 Background

This chapter will introduce the relevant archaeological, ethnographic and ethnohistoric literature surrounding cultural features, including what they are, how they are classified, analyzed and interpreted, in order to serve as a guide for the remainder of this thesis. The spatial location of storage pits on both Western Basin and Early Ontario Iroquoian sites are also discussed.

In order to contextualize this discussion about cultural features, a brief summary is also provided of the early Late Woodland period in Southwestern Ontario. The intent of this discussion is to provide a general idea as to what was going on in the archaeological record during the time period of A.D. 1000 to 1300 for the two groups in question (see Ferris and Spence 1995; Murphy and Ferris 1990; Warrick 2000; Williamson 1990 for a more comprehensive review).

It should be noted that until recently archaeology in Ontario was dominated by the study of the Ontario Iroquoian Tradition, particularly the Late Woodland to historic time period, as a way to identify the development of historically known groups encountered during European contact. It was not until 1965 with the publication of James Fitting's *Late Woodland Cultures of Southeastern Michigan* that Late Woodland patterns west of the Ontario Iroquoian Tradition started to be identified within a cultural historical framework. Fitting described four phases of development in southeastern Michigan based largely on ceramic designs that he felt were distinct from previously existing ceramic typologies, and should therefore be classified within its own cultural tradition (Fitting 1965:152). Subsequent to that work, Stothers (e.g., Stothers 1975, 1978; Stothers and Pratt 1981) revised Fitting’s work to encompass a wider region than southeastern Michigan, including northwestern Ohio and southwestern Ontario, and named this wider Late Woodland manifestation the Western Basin Tradition. Ontario archaeologists subsequently sought to plug local Late Woodland archaeological findings into that framework.

2.1 Southwestern Ontario Archaeological Traditions

During the time period between A.D. 1000 and 1300 the region now known as southwestern Ontario was inhabited by peoples that left behind two distinct archaeological traditions. One of these, the Western Basin Tradition, appears to extend across southwestern Ontario, southeastern Michigan, and northern Ohio (Murphy and Ferris 1990:189). The Western Basin Tradition is broken down into four temporal phases, based on changes in material culture, settlement and subsistence practices. The other, the Ontario Iroquoian Tradition, generally appears east of Western Basin deposits, and extends further east across much of the rest of southern Ontario (Ferris and Spence 1995:109; Williamson 1990).

Western Basin Tradition sites are found in a variety of locations, such as near lakes and rivers, as well as more inland locations, and this is thought to reflect their seasonal subsistence pattern of exploiting resource rich areas (Foreman 2011; Murphy and Ferris 1990:224). Typically, it has been argued that groups of people came together in warm weather months to hunt, fish and harvest plant materials, though diversified subsistence during this time typically meant that warm weather camp sites were not continuously or fully occupied through the entirety of this time. People would then disperse into smaller family groups during the colder months. Sites are usually found to consist of a scattering of pit features, and occasionally a dwelling structure, as is evident at the Van Bree site (Cunningham 1999). Some sites, such as Dymock (Fox 1982a), Figura and Bingo Pit (Golder 2012), display a more substantive settlement pattern of houses and palisades.

The archaeology would suggest that people who left behind Western Basin archaeological materials practiced a diversified subsistence regimen, revolving around hunting, fishing, gathering plant materials and the consumption of some maize. The importance of maize in the diet of Western Basin peoples had previously been minimized (Murphy and Ferris 1990), until recent stable isotopic analysis of human teeth from the Krieger site indicated that “maize was consumed in quantities comparable to those of more distant Early Ontario Iroquoian populations” (Watts et al. 2011:467; see also Dewar et al. 2010).

In a recent analysis of Western Basin and Iroquoian faunal assemblages Lindsay Foreman (2011:151) discovered that Western Basin peoples exhibited a high degree of flexibility in hunting and fishing practices, as evident in the quantities and species of fish and animals collected. Fishing was found to be an important part of the Western Basin diet, as it was practiced year round and is reflected in the location of sites located near rivers and lakes (Foreman 2011:64).

By contrast, Ontario Iroquoian Tradition (OIT) sites are typically represented by small villages (under 1 hectare), that had a palisade and were generally characterized by a series of large dwelling structures, or longhouses, laid out in an unorganized or organized fashion (Timmins 1997; Warrick 1984:54-61; Williamson 1990:306). Overlapping structures and features suggest multiple short term occupations over a long period of time (Ferris and Spence 1995:107; Timmins 1997; Warrick 1984; Williamson 1990:306). OIT houses were comparably shorter (10-15 m long) than later period longhouse forms, and had two or three centralized hearths, with large storage and refuse pits located both inside and outside the houses (Warrick 2000:436). Village sites represent the majority of Ontario Iroquoian sites found, though smaller sites such as specialized hunting or fishing camp sites have also been documented (Warrick 2000:437; Williamson 1990:313-317).

OIT-associated people appear to have hunted, fished and gathered plant materials, which included growing maize (Ferris and Spence 1995:107; Warrick 2000:437; Williamson 1990:306). Stable isotope analysis of human remains indicates that maize accounted for 20-30 percent of their diet (Katzenberg et al. 1995; Schwarz et al. 1985). Deer was a valuable resource to OIT peoples, with deer representing over 80% of the faunal assemblage at the Calvert site (Timmins 1997:94). Fishing does not appear to have been as important to Iroquoian peoples, as indicated by the number of fish remains found on OIT sites (Foreman 2011:76).

Both Western Basin and OIT archaeological sites reveal a range of similar types of material culture, such as lithics and ceramics, but the way they interacted and thought about their material was drastically different. In a ground-breaking analysis of Western Basin and Ontario Iroquoian ceramic vessels, Watts (2006) compared vessels from both groups based on morphology, decoration and symmetry to determine that potting practices were very different among the two groups, likely due to differing social organizational processes, how transitory or settled communities were, and who were responsible for vessel manufacture. This suggests that the people from these two archaeological manifestations operated from distinct material traditions, as they both viewed the world differently as reflected in ceramic morphology and design. Watts' approach is unique, as it clearly defined the two groups in question free of an ethnic component that had dominated previous studies of the two groups.

During this time period southwestern Ontario was going through a transition on the border between these two archaeological traditions. This borderland shifted westwards as time went on, with the Western Basin Tradition being supplanted later in time and in the same area by sites associated with the Ontario Iroquoian Tradition. This is evident at the Van Bree site, where both Western Basin Tradition and Ontario Iroquois material were found (Cunningham 2001).

2.2 What is a Cultural Feature?

Cultural features can be ubiquitous on more recent archaeological sites, particularly in the Late Woodland period, and come in many shapes and forms. Features are present in or on the ground of an archaeological site (they can even be the entirety of the surface of an archaeological site), and have been defined as non-portable physical remains of cultural behavior (Shott 1987:360). Features can include hearths, burial pits, post moulds, cache, storage and refuse pits including middens, structures, as well as features related to resource extraction (such as clay), or construction, such as wall trenches and house floors (e.g., Chapdelaine 1993:185; Dickens 1985:38; Schroedl 1986 as cited in Green and Sullivan 1997:2; Shott 1987:360; Stewart 1975).

2.2.1 Do Features Look the Same?

In effect, features encompass the full range of intentional and unintentional alteration contexts at a locale by human action that remain evident archaeologically. As such, features vary greatly in their function, fill and form. Features do not look the same mainly because they differed in function, construction, fill and material.

For this study, I will be concentrating on the range of feature forms that are identified as in-soil disturbances that are archaeologically identifiable by variable soil content, colour, and texture compared to the surrounding subsoil. On the Figura site there are a wide range of these kinds of cultural features. While variation in shape, plan, soil and content can reflect a number of causal explanations, function – the intended or resulting use of the feature by the site's inhabitants – is an important distinction to flag. In effect, different functions may require different depths, profile shapes and plan views. For example, you would not expect a hearth and a burial pit to look the same, as they have drastically different functions. Likewise, functional needs may be spatially distinct, as in not being placed in locales where the function is not needed, or replicated at several locales where different site occupants require similar features for the same purpose(s).

Depths of cultural features can range from a few centimeters to well over a meter. Feature profiles also vary in shape, and can be cylindrical, circular, basin, bathtub, conical, u-shaped and v-shaped to name a few (Dickens 1985; Lennox 1982; Stewart 1975; Timmins 1997). Plan views can be round, oval, elongated or irregular (Lennox 1982). Plan and profile views can be distorted due to plowing activity, and other natural or cultural activities that occur once the pit was filled in.

Features also vary in their fill. Features are filled in either intentionally, as the result of human behaviour, or unintentionally by natural agents or processes, or a combination of both. Some features, such as those that contained food waste, would most likely have been in-filled quickly to help mask the odour of decaying waste organics, which is often reflected by the presence of a rich, black organic soil layer in features (Bursey 2003:208; Moeller 1991:122). Feature fill can also indirectly help the researcher infer feature function. Some storage features were lined with bark because the liner would have protected the food stuff stored within them from moisture and rot (Bendremer et al. 1991; Bursey 2001:182). Once the bark lining decayed it would produce an organic layer on the bottom or outside of a feature (Timmins 1997:165). The number of layers present in a feature can also reflect multiple stages of the use-life of a feature (Dunham 2000:236), and these different layers can be a result of different functions or content (Moeller 1991:108). How homogenous or not the fill is in a feature can also be an indication of the in-filling process of that feature, as more homogenous fill suggests rapid filling, while a more layered and stratified fill can suggest more sequential filling occurring over a longer period

(Dickens 1985:54). If layers in a pit are disturbed by scavenging animals it can indicate a lack of human presence at the site at that time, as animals would be able to burrow into pits more freely (Bursey 2003:210).

It should be noted, though, that fill may not help interpret the function of a feature accurately, since fill is a secondary consequence of the use-life of the feature (DeBoer 1988:5). For example, in an examination of the features from the Upper Saratown site, Wilson (1985) evaluated the behavioural implication of the features and their fill using charred plant remains. With this analysis he demonstrated that feature fills cannot be lumped together, as they represent different activities, and should be looked at distinctly in order to help reconstruct the activities that were happening at the site. This was the case in Dickens' (1985) study, where floral data were used to determine when features were abandoned. He determined that features interpreted as storage pits were often filled-in during the late summer and early winter when the features would have been checked for their possible re-use as storage facilities. Borrow pits on the other hand were filled in during the late spring and early fall as clay would have been collected during the warmer months (Dickens 1985:56).

2.2.2 How are they Classified?

Inherent differences in the appearance and content of features, such as size, shape and fill, tend to affect how they are classified and analyzed in archaeology, with different researchers using different classification systems based on what they chose to emphasize. Attributes of form (shape and size) are felt to be most closely connected to the primary or intended function of a feature (Dickens 1985; Green and Sullivan 1997:2; Stewart 1975:149). As a result, in the literature reviewed for this study, feature form was most commonly used when classifying features (e.g., Dickens 1985; Dunham 2000; Fox 1976; Green and Sullivan 1997; Hatch and Stevenson 1980; Lennox 1982; Means 2000; Stewart 1975; Timmins 1997; Wilson 1985).

Stewart (1975) was one of the first archaeologists to study features as an archaeological unit of analysis. Attributes of size and shape, (as well as fill and layers) were used to group features from the Engelbert site into types. Features were first divided into surface and subsurface, then into fire and non-fire related pits. Attributes of size, shape, depth, artifact content, associations, matrix and site type were then used to sub-divide the features. For example, size was used to distinguish between non-fire pits, while shape was most useful for distinguishing fire pits. For non-fire pits location (habitation and non-habitation) was used after size to help distinguish between feature types. This system effectively classified all of the features she came across in her analysis, but was by no means totally comprehensive (Stewart 1975:100-106). She was only able to assign function to large and small pit features, which only represented a portion of her sample.

Fox (1976) analyzed features from one house at the Dewaele site, an Early Ontario Iroquoian site. He typed the features based on size, profile shape, and the presence or absence of stratification. Based on these measurements and profile shapes he distinguished two types of features present at the site. Type 1 features were large, flat bottomed and stratified and interpreted as storage pits due to their shape and size. Type 2 features were smaller, rarely stratified and had variable profile types and were interpreted as refuse pits due to their small size (Fox 1976:182).

Hatch and Stevenson (1980) classified features from the Fisher Farm site in Pennsylvania following the methodology set out by Stewart (1975). They typed features based on plan shape, depth relative to opening, and overall size (Hatch and Stevenson 1980:141). Calculations were used to type the features with the results being displayed graphically. They were then able to type the features based on the graphs, as features with similar shapes and sizes clustered together. Features were also divided into fire and non-fire related to help with their classification. They were able to identify three types of fire-associated features and only one non-fire associated feature. They then tried to associate function to the features they analyzed, but this proved difficult and their content did not aid in their interpretation, nor did the ethnographic record (Hatch and Stevenson 1980:166).

Lennox (1982) classified the features at the Bruner-Colasanti site based on profile and plan view, along with feature fill to some degree. He used eight profile shapes, as well as four plan shapes to type the features. The plan views included: circular, oblong or oval, elongate (2x its width) and irregular. Profile shapes included: straight sides with flat or slightly rounded bottom, u-shaped, conical or v-shaped, pan shaped (sloping sides, flat bottom), bell shaped, irregular, indistinct, and cave-in (a sub-category when the original profile was still discernible). Lennox only provided interpretations for two feature categories, storage pits and hearths, based on their form, content and fill. The remainder of his feature types were deemed miscellaneous, as their function was unclear (Lennox 1982:10-12).

Dickens (1985) classified features from several Southeastern sites based on size, plan size and shape, as well as on the presence of coverings or linings. Eight feature types were identified, and a function was assigned to each based on ethnographic information, size, shape and content. Type 1 features were classified as storage pits, as they had a small opening, were straight or bell-shaped in profile, and occasionally had a covering (i.e., rock slab) associated with them. Type 2 features had a large opening, were shallow and had no lining. These features were interpreted as borrow pits, mainly for extracting clay. Type 3 features had large openings and were basin shaped in profile. They were interpreted as house floors, as they were shallow and contained evidence of other features (i.e., heaths). Type 4 features had small openings, were shallow with basin shaped profiles, and were lined with rocks or burnt clay, suggesting they functioned as hearths or cooking features. Type 5 features had large openings, were shallow with basin-shaped profiles and also had burnt areas and fire cracked rock suggesting they were hearths or cooking related features. Type 6 features were ditches with wide openings, shallow sloping sides and could contain post moulds. Type 7 features had small openings, were shallow, and had rounded or pointed bottoms. They were interpreted as post moulds due to their small size and arrangement in rows. Type 8 features were deep, with straight sides and contained human remains, and were interpreted as burial pits (Dickens 1985: 38-40).

Green and Sullivan (1997) classified features from the Ripley site in New York based on an attribute analysis derived from Stewart (1975). They first divided the features into architectural and non-architectural pits. For non-architectural pits they used depth and diameter measurements of the features to determine type. Using this method six types of features were identified based on their overall size. Type 1 features were small to medium sized and shallow. Type 2 features were large and shallow to medium depth. Type 3 were medium sized and had medium depth. Type 4 were large and deep. Type 5 were medium sized and deep to very deep. Type 6 were extremely large and shallow. Functions for these features were not readily interpreted, but the authors did suggest functions for some individual features based on their shape and size (i.e., storage pits for Type 5).

Timmins (1997) classified features from the Calvert site based on size and form following Fox (1976). Timmins first calculated the volume of a feature using a formula for spheres or cylinders, depending on profile shape. Feature volume clustered into two groups, one under one hectoliter and one over a hectoliter. Profile shape was then taken into account to type the features. Three types of features were identified in this manner. Type 1 features had a volume greater than one hectoliter and had cylindrical or bathtub shaped profiles. These features were interpreted as storage pits due to their form, content and fill (Timmins 1997:166). Type 2 features had volumes less than one hectoliter and were dish, bowl or irregular in profile, and were interpreted as casual refuse pits due to their form, and location within the longhouse (Timmins 1997:166). Type 3 features were less than one hectoliter and had cylindrical or bathtub shaped profiles. Type 3 features were interpreted as in-house refuse disposal due to their high artifact counts (Timmins 1997:167). Hearths were excluded from these types as they were easily recognized and did not produce many artifacts (Timmins 1997:158).

For the Peck site, Means (2000) wanted to examine features to explore social and behavioral relations using site organization. To do this he attempted to use the methodology used by Green and Sullivan (1997) to determine feature types, but this method did not prove useful as there were no evident distinctions with the features at the Peck site. He then calculated feature volume to classify features, as volume takes into account the length, width and depth of a feature. He did not classify features into discrete types, as he felt they masked the variation he saw in the features (Means 2000:54).

Dunham (2000) classified features from the Ne-con-ne-pe-wah-se site based on their shape and size, and interpreted them based on ethnohistorical documents. He identified four basic types of features based on their location and their function: storage pits, pit ovens, wild rice threshing pits, and maple sugaring pits (Dunham 2000:229-233). Cooking pits were located at habitation sites, whereas wild rice threshing and maple sugaring pits were located near specific activity areas. Storage pits were located away from habitation sites due to the need to conceal this type of feature and their content. Based on feature size, shape, location and contents Dunham

(2000:238) interpreted the features from the site as cache pits because their shape was consistent with recorded cache/storage pits and the features contained large quantities of seeds and nuts.

The preceding discussion reflects a long history of archaeological efforts to make sense of the kinds of in-soil cultural features present on sites in eastern North America from the last millennium. It is clear that shape, size and content all played an important part of these classificatory systems, along with occasional indirect or direct references to ethnographic data. All studies tended to be site, culturally and temporally specific. Challenges to typing include the likelihood of similar shapes being used for different functions, or even the same feature having different functions over its use life. Volume studies refine shapes, but grapple with variable impacts of surface disturbances (e.g., plowing), leaving volume distinctions potentially skewed. Likewise, ethnographic data shows that function often differed based on location specific needs and activities of site occupants. All this would tend to suggest that typing features works more effectively at organizing a site-specific dataset as part of a larger analysis that requires consideration of a multitude of lines of evidence to get at anything more, such as function or spatial contexts across the site.

2.2.3 How are they Interpreted?

Feature function is interpreted in many different ways. Most often, the shape and size of the feature are considered, as well as its contents and location. The use of feature content for interpreting function is challenging, as feature content generally represents secondary waste (Dickens 1985:35; Green and Sullivan 1997:2; Stewart 1975). The shape of features can inform the archaeologist as to their function and these specific functions are often inferred from ethnographic or ethnohistorical records. For example, large, deep and cylindrical or bell-shaped pits are interpreted as storage pits because of their size and shape, from ethnographic sources, which fairly consistently implies storage or caching of material or food in such pits, and because deeper pits can keep stored goods in a cooler environment (Bursey 2001, 2003; Dickens 1985; Dunham 2000; Stewart 1975).

While the content of features may not be directly linked to the primary function of a feature, it is still used by many archaeologists to aid in their interpretations. In certain cases content can help infer function, as hearths usually contain reddened soil, and fire-cracked rocks (Lennox 1982:9-10). Storage pits are also interpreted based on the presence of plant material, especially maize found *in situ* in features (Bursey 2003:211; Dickens 1985; Stewart 1975). The content of features can be a reflection of activities performed around the pit (Stewart 1975:156-157), such as related to processing food or other goods, but this is not always the case as some material can be deposited away from original use locations. Features that are full of cultural material are generally assumed to be refuse pits. These pits could have been created for the simple need to manage waste, or just as likely would have served another function first then were filled with refuse once their intended function was complete or no longer viable.

The simple presence or absence of features on a site can also help interpretations (DeBoer 1988; Ward 1985). The presence of features at a site can be used to indicate longer term occupation, as well as the intensity of the occupation (Chapdelaine 1993:187; Foreman 2011:27; Kenyon et al. 1988). Overlapping features and structures can also indicated re-use of a site over time (e.g., Timmins 1997).

2.2.4 Do Large Features Always Contain Large Quantities of Material?

Large features, such as storage pits, do not always contain large quantities of material in them. The size of a feature is not an indicator of the amount of material that will be found in that feature, as is typically the case for larger Western Basin sites with large numbers of storage pits (e.g., Kenyon et al. 1988; Lennox 1982). Most authors are in agreement that features were not primarily dug to be used for refuse, but rather refuse disposal is a secondary opportunity features provide, to minimize the labour and time spent digging them (Bendremer et al. 1991:331; DeBoer 1988:4; Hayden and Canon 1983:159; Wilson 1985:79). In particular, once large features became unsuitable for re-use due to erosion, slumping or rot that is when they would be used to deposit refuse. Since large features are generally interpreted to have originally been used as storage pits, it is perhaps not unreasonable to expect them to be found empty during archaeological excavations, as their primary purpose would have been to hold foodstuffs for retrieval at a later time.

Features contain material for various reasons, but convenience is an important consideration in refuse disposal (Hayden and Cannon 1983:119; Schiffer 1977:21). An example of this kind of expediency are door dumps, which are refuse piles that are located just outside of house entrances (Tani 1995:237). Refuse is literally tossed outside the entry way of a structure and accumulates there. Middens may also be found adjacent to houses, suggesting that refuse was placed where it was most convenient, although middens are also found removed from residential areas, presumably for communal use and to provide some distance, given that middens attract vermin and could exude overwhelming odour.

When looking at the features from the Faucett site, Moeller (1991, 1992) observed that most of the large features were virtually empty. After a lengthy analysis based on presence and absence of artifact classes, he determined that empty features served as short term food storage pits. He felt that these pits were dug for short term food protection rather than long term food storage or caching (Moeller 1991:122). His interpretation was augmented by the artifacts found at the site, which mainly consisted of items associated with food preparation and processing (Moeller 1991:123). This interpretation fits the evidence at the Faucett site, but should not be applied to all sites without sufficient evidence and analysis.

2.3 Ethnographic and Ethnohistoric Data about Features

The use of ethnographic and ethnohistoric sources is a double edged sword in Northeast archaeology, as these datasets provide insight into aspects of daily life for past Native populations that we archaeologically cannot get at easily, such as ideology, ritual and religion. However, these sources can also be problematic if researchers assume that the lifestyles depicted in these sources are readily applicable to archaeological periods prior to the time of European arrival. Ethnographic and ethnohistoric records are also often biased as the writers were there for a specific reason, for example to convert Native populations to Christianity (Trigger 1976, 1985). With these cautions in mind, the following section reviews the literature for descriptions and interpretations of subterranean features found at historic Native settlements. Ethnographic and ethnohistoric sources from the Great Lakes region were reviewed and include Waugh (1916), Champlain (1929), Densmore (1929), Sagard (1939), Parker (1968), Morgan (1969) and Tooker (1967).

Luckily the ethnographic and ethnohistoric sources are relatively robust and contain first hand observations of activities related to the use of pits. Many different types of features were recorded, with the main description being about their function. Features associated with storage and fire are most commonly reported on, but there are also descriptions of burials, earth or pit ovens, and fire related activities such as hide smoking. There is virtually no mention of using pits for refuse disposal in the ethnohistoric records reviewed for this study (Stewart 1975:53-54).

2.3.1 Storage Pits

Accounts of storage pits describe their function, content and their form. Champlain (1929:410) described holes five to six feet deep dug into sand slopes to preserve corn and other grains, which were first placed in large grass sacks before being placed in the holes. The pits were then covered over and the contents would be retrieved as needed. Among the Ojibwa, Densmore (1929:40) described storage pits as being six feet deep and lined with birch bark. Hay was placed between storage containers and a birch bark or hay cover was added. Wood beams were laid across the pit and then covered with dirt. Parker (1968:14) noted that storage pits were found inside houses, not just outside of them. The use of a lining in storage pits is well documented, with materials such as grass (Parker 1968:35) and bark (Densmore 1929:40; Morgan 1969:319; Parker 1968:36; Waugh 1916:43-44) mentioned.

Along with the use of pits for storage, some sources suggest another reason for storing things in pits. Sagard (1939:95) explained that the Huron’s most valuable possessions were stored underground because it preserved them from fire, as well as from thieves.

Based on these historic observations, then, archaeologically it would be reasonable to expect that storage pits can be defined as being large, having some sort of lining, and found both inside and outside of houses. That they could be covered over with soil (and presumably re-excavated at a later date) also suggests their use life could have been relatively limited, or subjected to multiple episodes of re-excavation. They were used to store food, as well as possessions, for the future, from fire, frost, animals, as well as from other people.

2.3.2 Other Uses of Pits

Cache pits are also mentioned as food sources used on trips away from villages. Sagard (1939:60) wrote that every few days on a journey someone would go get corn from a secluded, hidden place far from the trail. These cache pits most likely looked like other storage pits, but were just in a different location.

Graves or burials are another commonly discussed topic in the ethnographic literature. Stewart (1975:54) goes as far as saying that “outside of storage the most prevalent reason for digging pits was for use as graves”. While ossuaries are commonly described in the literature, a few instances of burials in pits by the Hurons are mentioned by Champlain (1929:160-161) and Sagard (1939:208). Unfortunately, they did not describe the shape or size of the pit used for burial, just that a hut or shrine made of bark was usually placed over the grave and then a fence of some sorts placed around that to keep scavengers away from the grave.

2.3.3 Fire and Fire Related Use of Pits

References to hearths and other uses of fire are numerous in the ethnographic literature. Pit or earth ovens were a common way food was cooked. Driver (1969:90) documented earth ovens as a pit in which hot stones and food were placed. The food was wrapped in leaves, bark and other material to keep it clean while it cooked. Both plant and animal materials were cooked using this method. The pit was then covered with dirt to conserve the heat and steam and left overnight. Skinner (1921:160-161) also noted that pit ovens were six feet long, four feet wide, and two or three feet deep. Earth or pit ovens can be identified archaeologically based on their shallow basin shape, as well as by the presence of a rock lining or rock content in the pit. They might also display evidence of heating, such as fire reddened soil.

Activities involving fire, but not related to cooking, that are most reported on are smudge pits. Smudge pits are described as small, with corn cobs and bark being used as fuel to colour hides that were suspended above the pit (Binford 1967:7; Parker 1968:86). Smudge pits, as described by Densmore (1929:164-165) are “18 inches in diameter and 9 inches deep. Over this framework was constructed and drawn over it…A fire had previously made in the hole…using dry corncobs for the purpose. The fire smolders slowly, the smoke giving to the hide a golden yellow color…” Smudge pits can be identified archaeologically by their small size, the remains of corn cobs and other plant material present in the pit, as well as fire reddened soil, as found at the late-eighteenth-century Bellamy site (Ferris 2009).

Maple sugar was an important food source for the Ojibwa, at least when Densmore (1929) lived among them. Sap was collected in birch bark containers. It was processed at maple sugaring camps, which included a building of some sort, multiple fires and pits. Sap was boiled in metal kettles after European contact, but skin-lined pits were also used. Sap was also stored in shallow pits or trenches lined with skins. Maple sugaring materials, such as pails, kettles and tree taps, were often cached close to the sugaring camp (Dunham 2000:232-233). Maple sugaring pits could be identified in the archaeological record due to their location near maple sugar trees, as well as based on the contents of such features.

2.4 What is a Storage Pit?

Storage pits have long been recognized in the archaeological record based on a number of traits that are associated with the ethnohistoric record from the Northeast. Storage was important in the past as it allowed surplus food to be saved for times of resource scarcity. Susan Kent (1999:80) has stated that storage is only found in sedentary to semi-sedentary populations and is only rarely found in highly mobile groups, but this is untrue for the Great Lakes region, as storage pits are located on many Western Basin sites that are not associated with settlements (Cunningham 2000; Murphy and Ferris 1990; Watts 2006). Storage was important for both mobile and sedentary populations (Ingold 1983), and thus evidence of storage can be found on many different types of sites.

Records of storage features in the ethnohistoric and ethnographic record are present, and they indicate that storage pits are large, deep and often lined with bark (Bursey 2003:221; Dickens 1985:40-41; Stewart 1975). In rare cases features are found that have quantities of plant remains still intact. For example, at the Calvert site Bill Fox (1982b:7) reported finding a 4 cm thick layer of carbonized maize kernels at the bottom of a feature. The maize appeared to have been deposited while it was still moist as there is evidence of compaction of the kernels. At the Cherry Lane site, dense quantities of carbonized nut shell were also recovered from storage features (Murphy and Ferris 1990).

Thus, storage pits are identified based on their shape and size in the archaeological record. They are described as being large, deep, and either cylindrical or bell shaped in profile, often with flat or slightly curved bottoms (Bursey 2001:182; Dunham 2000:229-230; Hart 1995:41). The shape of these pits, cylindrical or bell shaped, appears to have been ideal for containing for stored food (Bursey 2003:211), serving as a kind of root cellar, where the cool temperatures of the ground would have helped preserve the materials (e.g., Murphy and Ferris 1990). A deep pit with a relatively small orifice would be easier to make watertight than a pit with a large orifice relative to its depth (Allegretto 2007:119), and should have a low surface area to volume ratio (Bendremer et al. 1991:325-326). Round or spherical containers are ideal for the storage of bulk items, thus a cylindrical shaped pit would appear to be an ideal container for stored corn and or other bulky foodstuffs (Hunter-Anderson 1977:305; Stewart 1975). Variation in the size of storage features suggests functional differences in pit utilization: large pits for long term storage, smaller pits for short term storage (Bendremer et al. 1991:331). Food may have been stored in containers within the storage pit, such as woven sacks, animal skins, baskets, bark containers or ceramic vessels, as described in ethnographic sources (Dunham 2000:229-230). Some authors have identified a list of traits associated with storage pits, such as presence of a lining, large quantities of botanical remains, little evidence of burning, and high volume and depth to diameter ratio (Bendremer et al. 1991:330), but the majority of these traits, such as large quantities of botanical remains, are rarely found archaeologically.

Based on an archaeobotanical analysis of the fill of storage pits, Dickens (1985: 50) determined that so called storage pits are more likely abandoned and filled with garbage in the fall and early winter than during other times, as the pits would have been examined for re-use at this time. The storage pits he analyzed indicated a late fall-early winter infilling based on the floral remains found in the fill (Dickens 1985:50). It should be noted that Dickens was examining pits associated with storing nuts, which would have been placed in the pit during the fall after they were collected.

Kent (1999) wanted to distinguish storage areas from trash areas in village settlements in Botswana and the American southwest. In this study she examined non-food storage, as she claimed that “agricultural storage bins, granaries, and similar features tend to be archaeologically recognizable” (Kent 1999:80), but this is not always the case, especially in the Northeast. Kent observed village residents and their storage and disposal practices. In terms of storage and refuse areas, “relatively low numbers of artifact categories are associated with trash areas, regardless of the number of artifacts. This creates a less heterogeneous artifact assemblages at trash areas than occur at storage areas" (Kent 1999:81), meaning that storage areas have more diverse categories of artifact present.

In a study of the Calvert site features Timmins (1997) wanted to determine if it was possible to distinguish between storage and refuse pits. By examining the layers present in those features, he determined that features with little to no artifacts in their lowest layers probably served as storage pits, as the rotten liner of the pit probably contributed to the formation of the bottom layer, along with debris accidently deposited in the pit. Features with lots of artifacts in their bottom layers may have never been used for storage, and were just used for refuse (Timmins 1997:165-166). It also could have been that when storage pits were not suitable for storage anymore they were cleaned out and then refuse was deposited in them, which would account for features with many artifacts in their lower layers.

2.4.1 Other Interpretations of Cylindrical Pits

As noted previously, Moeller (1991, 1992) has a different interpretation for large, cylindrical pits from the Faucett site. He interpreted the Faucett site as a short term food processing camp, as these pits were used for storing fresh processed food while the site was occupied. The pits used for storage were then filled with refuse after they had served their original purpose.

Ward (1985) suggested that the abundance of cylindrical pits found at historic sites in the Southeast were for caching valuables at times when sites were abandoned for winter hunts. The pits would be buried to hide their contents from people visiting the site while it was abandoned. DeBoer (1988) also suggested storage pits in the American Southwest were primarily used for concealing stored goods when settlements were abandoned for short periods of time, or even from other members of the group. Dunham (2000) also echoes DeBoer, in his interpretation that storage pits were used to conceal items from other groups of people. Though, presumably, the desire to preserve and protect food stuffs, and the desire to preserve other goods and possessions, creates the same kind of storage feature.

2.5 Where are they Located?

Features that have been identified as storage pits are found on a variety of sites, as well as in a variety of locations across a site. As both mobile and sedentary groups store food, storage pits can be found on village sites, temporary camp sites, and also non-habitation sites (Dunham 2000:230).

2.5.1 Western Basin Younge Phase

During the first half of the Late Woodland period pit features are very common and are found on almost all Younge Phase sites in varying frequencies. These pit features are found within structures (if structures are present at a site), as well as outside of structures (Fox 1988:2; Murphy and Ferris 1990:236). The large, deep pits on Younge Phase sites are uniformly interpreted as storage pits. These sites could have been visited during a time of food shortage, and would have provided a much needed reserve of food. Some pits, such as those at the Robson Road site, show evidence of bark lining in the pit, which would have helped preserve plant material, such as corn, for longer periods of time (Murphy and Ferris 1990:236).

Robson Road, a Younge Phase site, produced hundreds of pits which contained evidence of both warm weather and cold weather floral and faunal remains (Kenyon et al. 1988). These pits ranged from 80 to 120 cm in diameter, and from 40 to 70 cm in depth, though depth would have been truncated by previous cultivation, and topsoil stripping at the site. The storage pits from this site were all uniform in appearance with a circular outline and a basin shaped profile (Kenyon et al. 1988:8). At this site there appears to have been an avoidance of old or “used” pits, as there were few overlapping features (Kenyon et al. 1988:10), and most features were void of large quantities of artifact debris. The site (Kenyon et al. 1988; Murphy and Ferris 1990) was interpreted as a seasonal harvest locale (for fish from nearby Leamington Bay), occupied for hundreds of years, and the low level of habitation-related activities at the site is seen as the likely reason for so many of the features to be void of artifact content.

At the nearby Cherry Lane site, excavations revealed a “wigwam-like” structure and many features located inside and outside of the structure. The structure was located between two knolls, along with many non-storage-like features, while 80 storage pits were found in clusters to the north and south of the habitation area on the knolls. Large quantities of nut and nutshell, along with other foods, were found in some of the pits, suggesting a fall occupation (Murphy and Ferris 1990:236-238). This separation between habitation and storage is also noted for other Younge phase sites.

The Bruner-Colasanti site consists of 300 pit and hearth features. These features were arranged in an oval pattern, and cluster around a central plaza area (Lennox 1982:9). Lennox identified eight feature clusters in total, which he associated with dwellings, based on the materials found within the pits as well as the presence of hearths (Lennox 1982:9). The season of occupation of the site has been determined to be late fall or winter, likely October to March, based on the faunal and floral material present (Lennox 1982:73; Foreman 2011:45-46). The sheer number of features at this site suggests an intensive occupation over an extended period of time.

It should be noted that a different interpretation of the Bruner-Colasanti site is provided by Murphy and Ferris (1990:238-239). They question the feature clusters as locations of houses, and see the houses as likely located in the more open, “plaza”-like area, than encompassing the clusters of pits. This interpretation is more consistent with the Cherry Lane site, as houses and storage areas were separate. They see this site as being a hunting and nut collecting camp based on the presence of carbonized remains of acorn, walnut and hickory.

The Van Bemmel site consists of a palisade, eight hearths, and features no deeper than 50 cm (Ferris 1989:8). The features from the site overlap, which indicated that it was re-used over time. The presence of a palisade is interpreted as a wind break. This site is interpreted as a late fall hunting camp, based on the faunal, lithic and settlement pattern from the site. Due to the amount of lithic material, especially scrapers from the site, it is seen as a very intensive occupation, likely for the processing of deer (Ferris 1989:18). The lack of storage pits at this site indicates that it was used for a short period of time each year, likely during a fall hunting season, and was not visited between uses, so resources did not need to be cached there (Ferris 1989:18; Murphy and Ferris 1990:242-243).

2.5.2 Early Ontario Iroquoian

Storage pits are located on EOI village sites in various locations across those habitations. On village sites they are most commonly located within houses (Smith 1986; Ward 1985:86; Wright 1986), but they have been found outside of houses as well, usually along the perimeter of the village (Timmins 1997:149).

At the Calvert site, Timmins (1997:165) observed that the majority of storage pits were found outside of houses and near the palisade wall. A few storage pits were located between houses, and also within houses. Within houses, the storage pits were located along interior walls, in corners or even along the central corridor in some cases.

The DeWaele site consists of four houses and three rectangular structures inside a palisade. The site appears to have been re-occupied over time, as indicated by overlapping features and structures (Fox 1976). No storage pits were found in two of the houses, but three clusters of storage pits were found in House 3, an oval structure. Other features such as hearths, ash and refuse pits, as well as post molds were found within this house (Fox 1976:179-180). The storage pits clustered along the northwest exterior wall of the house, as well as in the south and east corners (Fox 1976:184).

Bursey (2001, 2003) performed a detailed review and analysis of storage pits in the Northeast, and specifically studied a storage structure from the Forster site, a Princess Point site. In his review of storage practices he examined the ethnographic record and other literature on storage to determine possible functions for large, deep pits. After reviewing the data, he concluded that the function of these pits is most likely related to the storage of food (Bursey 2001:184, 2003:221). He then used this information to interpret the Forster site, where four pits, two of which are cylindrical, were located within a structure. This structure is interpreted as a specialized storage structure, as it contained storage pits. There was little to no evidence of habitation in this structure, as it lacked a hearth and other domestic evidence, such as bunk lines (Bursey 2003:224).

The abundance of storage pits on many sites indicates that storing food, and other materials, was an integral function for people. The fact that they are located at many distinct site types demonstrates that groups relied on stored food for survival at different times of the year. The majority of Younge Phase Western Basin sites have some to many storage pits, indicating that storage played a key role in the foodways of this group. Notably, given that Younge Phase populations also consumed maize year round, even though they did not live in villages like EOI populations, underscores just how critical foodstuff storage and off-season access to cached supplies were to their diets (e.g., Dewar et al. 2010; Watts et al. 2011). The separation of habitation and storage areas on Western Basin sites is interesting, and may relate to the caching or hiding of food from others (DeBoer 1988; Dunham 2000; Ward 1985), or the differences that arise from less formal village living, and residential dwellings being single family as opposed to the larger, more communal longhouse residences seen on Ontario Iroquoian sites.

2.6 Summary

Features come in a variety of shapes and sizes, which is a reflection of their differing functions. Features are classified by archaeologists based on a variety of different criteria, but they are mainly classified based on their profile shape. Features are then interpreted based on their size, plan shape, as well as their fill, content and spatial location. Features can help interpret sites, as the presence of features at a site indicates length and intensity of occupation, as well as activities that took place at a site.

As the review of ethnographic and ethnohistoric literature on features has shown, features were an integral part of everyday life for past populations. They were used for storage/caching, cooking, burials and food preparation, to name a few uses. These different types of features are generally believed to be distinguished archaeologically based on their specific morphological and functional characteristics, and context. Some features will no doubt differ from what is recorded in the literature, and this is why ethnographic and ethnohistoric sources should be used with caution when interpreting features. Exploring how feature technologies are manifest at the Figura site, and whether there is patterning to the form, content, use and distribution of these features, is explored in the next two chapters of this thesis.

Chapter 3

3 Methodology

This chapter outlines the methodology used in the analysis of features from the Figura site (AgHk-52). All features from the site were first classified into preliminary types based on a combination of previously established typologies in the literature. Following that discussion, I review my approach of trying to organize features spatially across the site by feature attributes, in order to then explore various feature characteristics that may help interpret site area activity. The chapter will end with a discussion of how spatial dimensions of feature locations across the site can be analyzed and compared in Chapter 4.

3.1 Feature Classification

The 300 features from the Figura site were classified based on profile shape and volume, consistent with those characteristics most commonly used in the literature (e.g., Dickens 1985; Dunham 2000; Fox 1976; Green and Sullivan 1997; Hatch and Stevenson 1980; Lennox 1982; Means 2000; Stewart 1975; Timmins 1997; Wilson 1985). These characteristics are also most closely associated with possible function of a feature, and also noted as such in ethnographic and ethnohistoric data (Champlain 1929; Densmore 1929; Morgan 1969; Parker 1968; Sagard 1939; Waugh 1916).

To evaluate plan and profile shape for features that were excavated in 2008, I relied on field records and feature forms provided by Golder Associates Ltd. According to the Golder report (2012), plan types for features from Figura varied between circular, oval, kidney, and irregular. While their terminology is maintained here, Golder's profile terminology for Figura features was not, because there appeared to be discrepancies in the application of those terms. Instead, I reviewed all feature profiles from the site and determined that feature profiles could be sorted into three categories: cylindrical, basin shaped and shallow "smears."

Feature volume was calculated using a basic formula of length by width by depth. This formula was used to provide a relative volume of each feature so they could be compared easily based on their overall size. The volumes calculated for each feature are by no means the original, actual volume of each feature, considering that this site was topsoil stripped and then shovel shined multiple times, so the volume and measurements recorded for each feature are an arbitrary comparison of the remaining bottoms of all features across the site.

3.1.1 Feature Types

Based on the criteria above, all the features from the site were sorted into five broad types based on volume and profile shape (Types A-E). This approach is similar to the typology used in Fox (1976) and Timmins (1997). Volume was used as a defining characteristic as it provides a consistent measure of overall size across all features from the site. To better examine the size of features present on the site, volumes were graphed in hectolitres by frequency. Figure 4 demonstrates that 151, or 50.84% of the features were under one hectoliter and the remaining features are relatively evenly distributed between one and 20+ hectoliters. As with Timmins (1997:157-158), one hectoliter appeared to generally encompass features with conical and shallow basin shaped profiles, while features over one hectoliter were generally cylindrical or basin shaped.

In addition to the 5 types of feature, three middens were identified at the Figura site (Features 32, 53, and 161), as well as two hearths (Features 115 and 116). These are distinct categories of feature not included in any of the five types defined for the site, and are not included in the feature type discussion below, as they are identified based on other criteria (i.e., large and irregular size, fill colour, etc.), rather than by profile shape.

Type A features have a volume greater than 1 hectoliter, are cylindrical in profile, circular or oval in plan, and are or are not stratified (ranging from 1 to 5 layers). Type B features are less than 1 hectoliter in volume, are conically shaped in profile, circular, oval and irregular in plan and are or are not stratified (ranging from 1 to 3 layers). Type C features are less than 1 hectoliter in volume, are very shallow, are not stratified, and have very shallow basin shaped profiles with oval or irregular plans. Type D features are greater than 1 hectoliter in volume, are basin shaped in profile, irregular, circular or oval in plan, and are or are not stratified (ranging from 1 to 4 layers). Type E features have diffuse or irregular profiles, and are most likely not real cultural features.

These feature types are summarized in Tables 2, 3 and 4. Figure 5 and 6 provides a pictorial example of these feature types, while Figure 7 illustrates the spatial distribution of all the feature types across the site.

Figure 4: Figura Site Feature Volume

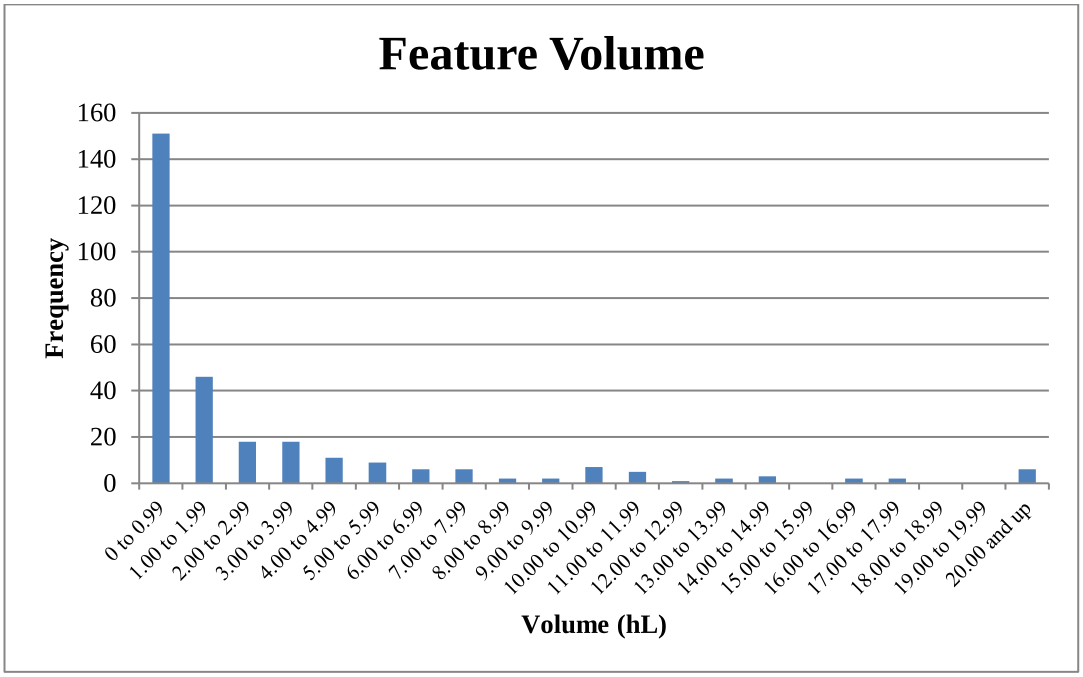


Table 2: Figura Site Summary of Feature Types

Feature Type	Volume (hL)	Profile Shape	Plan Shape	Number of Layers
Type A	More than 1 hL	Cylindrical	Circular or oval	1-5
Type B	Less than 1 hL	Conical	Circular, oval and irregular	1-3
Type C	Less than 1 hL	Shallow basin	Irregular and oval	1
Type D	More than 1 hL	Basin	Irregular, circular and oval	1-4
Type E	Less than 1 hL	Irregular, diffuse	Irregular, circular and oval	1-4
Hearths	Less than 1 hL	Conical	Circular or oval	1
Middens	More than 1 hL	Irregular	Irregular	varies

Figure 5: Figura Site Feature Types A to D

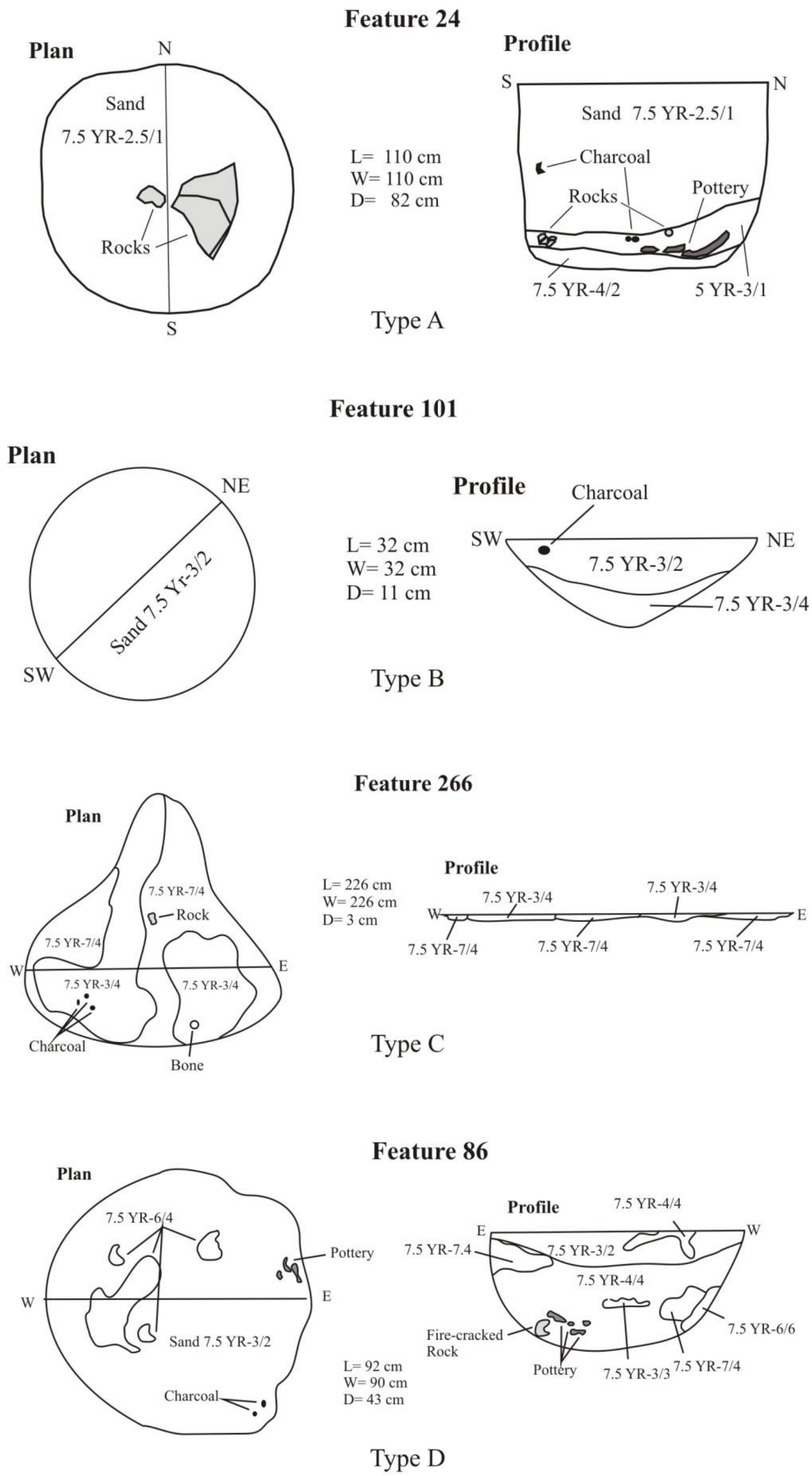
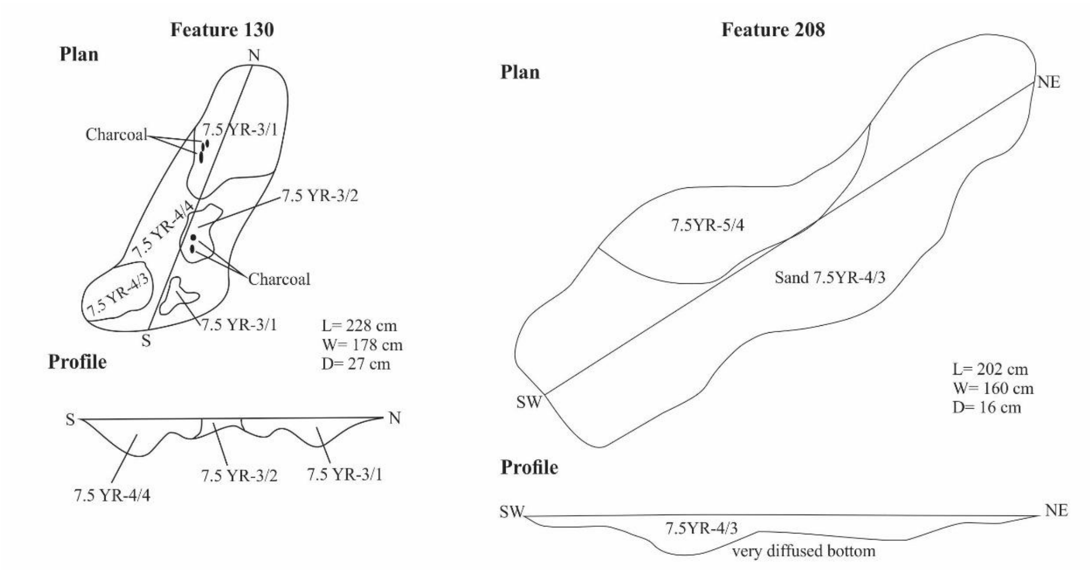


Figure 6: Figura Site Feature Types E



3.1.2 Preliminary Typology Results

In total, 300 features from the Figura site were preliminary grouped into the seven types described above. Twenty-three features categorized as Type A represent just under 8% of the total features from the Figura site. Type A features are large, have straight walls, and straight to slightly rounded bottoms making them cylindrically shaped in profile. These cylindrically shaped features were located both within (n=12, or 52% of all Type A features) and outside (n=11, 48%) the palisade. The vast majority of Type A features were also located outside of houses (n=20, 87%), with only 3 Type A features (13%) found inside houses. Table 4 provides the metrics for this feature type.

A total of 134 features were classified as Type B features based on their size, profile shape and plan type, representing just under 45% of the total features documented from the site. Type B features are conical in profile and thus have rounded bottoms. They were located both within (n=103, 77% of Type B) and outside (n=31, 23%) the palisade, as well as inside (n=43, 32%) and outside houses (n=91, 68%). The smaller size of Type B features most likely suggests a different function than other feature types.

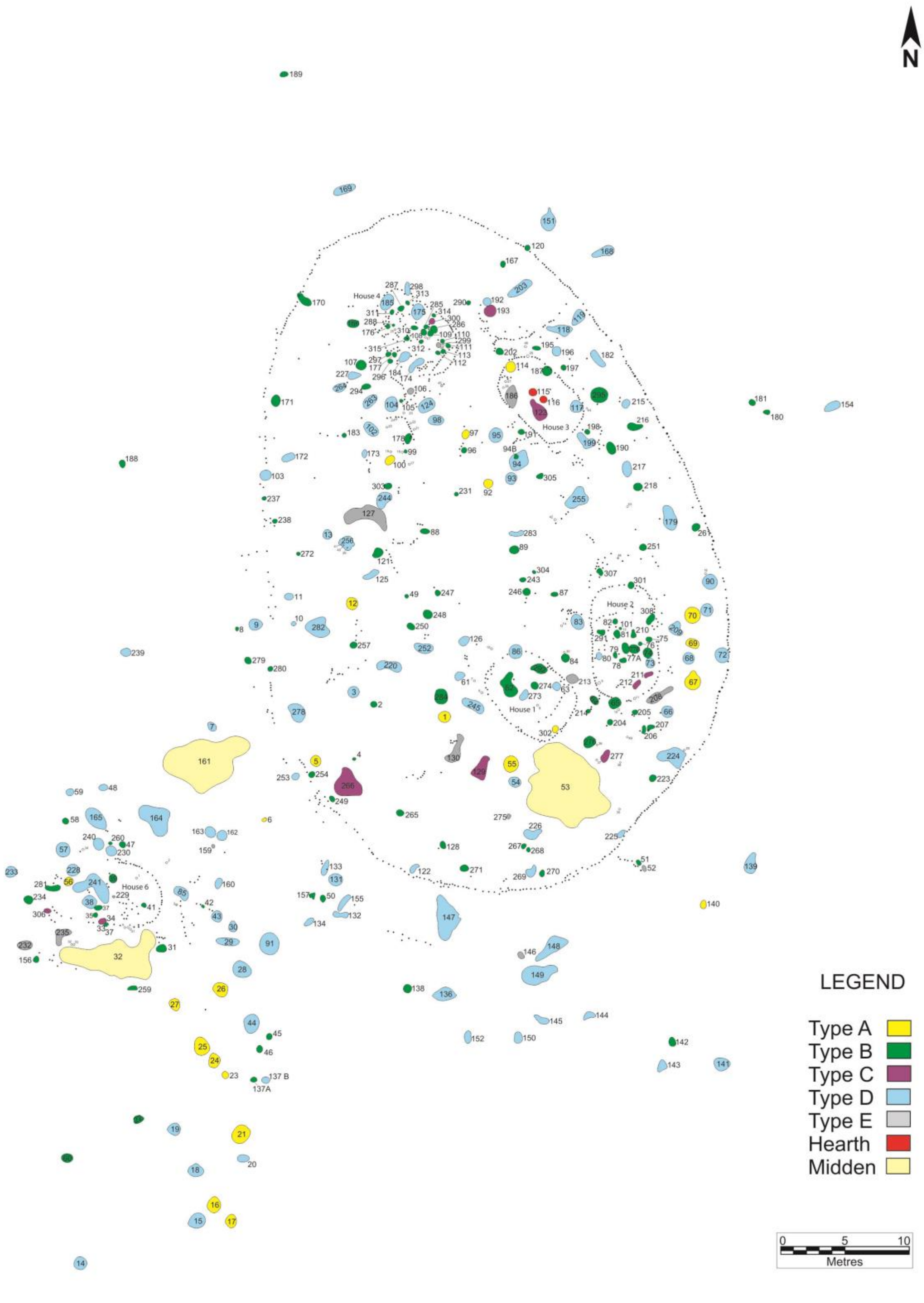
Table 3: Figura Site Summary of Feature Location

Type	Sum	Percentage	Interior Palisade	Exterior Palisade	Inside Houses	Outside Houses
Type A	23	7.67%	12	11	3	20
Type B	134	44.67%	103	31	43	91
Type C	10	3.33%	8	2	5	5
Type D	114	38.00%	63	51	14	100
Type E	14	4.67%	8	6	3	11
Hearth	2	0.67%	2	0	2	0
Midden	3	1.00%	1	2	0	3
Total	**300**	**100%**	**197**	**103**	**70**	**230**

Table 4: Figura Site Summary of Feature Type Metrics

Feature Type	Statistic	Type A (n=23)	Type B (n=134)	Type C (n=10)	Type D (n=114)	Type E (n=14)
Length (cm)	Average	104.43	51.50	105.9	126.85	113
	Range(max)	167	106	226	356	334
	Range (min)	50	21	32	48	18
Width (cm)	Average	94.52	43.61	83.90	99.40	80.64
	Range(max)	150	92	226	243	220
	Range (min)	42	16	32	32	17
Depth (cm)	Average	58.91	14.35	7.3	37.14	22.92
	Range(max)	82	37	12	101	54
	Range (min)	40	5	3	9	1
Volume (L)	Average	640.2	35.84	78.08	567.66	477.62
	Range(max)	1456	99.86	220.15	4423.57	3967.92
	Range (min)	102.48	2.64	4.62	102.82	2.31
Layers	Average	2.5	1.06	1	1.55	1.42
	Range(max)	5	3	1	4	4

Figure 7: Figura Site Spatial Location of Feature Types



Ten Type C features were identified from the site, representing under 4% of the total features found. Type C features have shallow basins with rounded bottoms. They are more commonly located inside the palisade (n=8, 80% of Type C features) than outside (n=2, 20%), and are evenly distributed inside (n=5, 50%) and outside houses (n=5, 50%), though their small number limits any meaning to such variation. Type C features are not stratified, and are very shallow, have irregular profile and plan types and most likely represent natural depressions.

A total of 114 features were classified as Type D, and represent 38% of the total features present at the site. Type D features have sloping sides and rounded bottoms. They were evenly distributed inside (n=63, 55%) and outside (n=51, 45%) the palisade. They are located inside (n=14, 12% of Type D features) houses, but are much more commonly found outside of houses (n=100, 88%). These features are quite large in size and have basin shaped profiles.

A total of 14 features were classified as Type E, and represent 5% of the total features present at the site. Type E features have irregular profiles and could not be classified into one of the previously mentioned four types. These features types are present inside (n=8, 57%) and outside (n=6, 42%) the palisade. They are located inside (n=3, 21%) houses, but are much more commonly found outside of houses (n=11, 79%). As these features have irregular profiles it is quite possible that these features do not represent intentional human action. These could have been natural depressions that were filled in by unintentional human actions. As I cannot be sure that these features were created by people, or for a specific function, this feature type will not be included in any further analysis of the features from this site. Type E features will be removed from further maps illustrating the site as well.

Given the size similarities between Type A and Type D features, I wanted to determine if Type A and D features are in fact distinct feature types. As such different measurements were compared, such as base angles and width to depth for a select number of Type A and D features. Base angles (i.e., the angle created by the joining of the side and bottom of a feature) were measured to test the uniqueness of these types. Type A features had base angles between 100 and 160 degrees, while Type D features had base angles between 130 and 164 degrees. It should be noted that base angles were difficult to measure for some Type D features as they have very curved sides without a definite side or base distinction (see Appendix A for a pictorial example and table). These base angles indicate that Type D features have a more rounded bottom. Type A features have a smaller angle between their sides and base, representing a more cylindrically shaped profile with flatter bottoms.

Width to depth ratios were also calculated for the Type A and D features to determine if this ratio differs for each feature type (See Appendix B). The width of each feature was divided by its depth to provide the ratio. The width to depth ratio of Type A features ranged from 1.02 to 3.13 with an average of 1.62, while Type D features ranged from 0.63 to 14.29 with an average of 3.26. Both Type A and D features have similar depths with an average of 58.91 cm for Type A and 37.01 cm for Type D. The difference in the ratio comes from a difference in the width of Type A and D features, with an average of 94.52 cm for Type A and 99.33 cm for Type D. This means that Type A and D features are different sizes as indicated by the ratio.

Based on their shape and size, Type A features most likely represent storage pits, which is consistent with how other studies have characterized this kind of feature (e.g., Bursey 2001, 2003; Dickens 1985; Dunham 2000; Stewart 1975). The conical profile shape of Type B features may suggest these features had a short term function such as smudge pit, pot holder, curing pit or short term cache-like function (Stewart 1975:89). Type C features, with their shallow smear-like profiles, most closely resemble house or living floors. The large, deep, basin shaped profiles of Type D features might have had functions including caching, food preparation and/or storage (Bendremer et al. 1991:344; Bursey 2003:212-213). I would caution, however, that while using features types may aide in site analysis and interpretation, it is too early to suggest functional differences for the feature types I have documented at Figura. Feature types predominately based on size and shape can mask variation among features and their function. There is also a large overlap between feature types that suggests using types by dimension alone runs the risk of lumping possible cultural differences together that should not be lumped together. This preliminary typology of feature types demonstrates that without further analysis only limited conclusions can be reached about the feature types.

Typing features by general appearance of plan and profile can give a sense of variation and intention across as feature assemblage. Certainly in the Figura case, large feature Types A and D appear far more regularly out of houses than in, while smaller, more expedient Type B appears with a little more frequency inside houses, and commonly within the palisade, presumably tied to activities that, in the moment, need whatever a Type B functionality provided. However, these general observations are also limited. As such, additional characteristics of features need to be considered to get at intent of features as initially constructed and as subsequently used. These characteristics are reviewed further below, in order to better inform interpretations in Chapter 4.

3.2 Spatial Analysis

If typing features consistent with other approaches to feature classification in the archaeological literature only allows for the observation that bigger and deeper features (Type A & D) tend to fall outside of houses and smaller features (Type B) tend to be more pervasive, both in houses and in activity areas inside the palisade, then typing provides only a limited utility at getting at the role of features across the Figura site. Another way to try and explore feature intention and use across the site is to explore spatial relationships of features to other settlement patterns. As noted in Chapter 1, Figura offers a very clear and ordered settlement pattern, likely reflecting consistent use of that space during the duration of a single, primary site occupation. Given that clarity (e.g., of where houses are and are not; where inside palisade and outside palisade space is), this provides an opportunity to consider features and locations as associated with various different functional areas of the site.

To perform a spatial analysis, the site was divided into different defined spaces or areas, each representing variable concentrations of features and/or structures. An obvious distinction is the use of feature space in and around the five houses on the site, and in and outside of the palisade, and feature concentrations across these areas. In effect, I chose to define feature areas as residential (in and around the five houses), and non-residential, defined by visibly notable concentrations of features located in close proximity to each other. Residential areas are comprised of features located both within defined house walls, and also encompassing space immediately around the house, which I chose to define as within or extending from an arbitrary one meter zone beyond house walls. While one meter was chosen arbitrarily, I felt that this space would reasonably capture directly associated external activities to each house. I also included features that overlapped the edge of these residential areas and included them in the residential group, which helps to qualify any arbitrariness the 1 metre designation might have imposed on this study.

Non-residential areas were divided into nine areas simply on the basis of visible concentrations of features, with Areas 1, 2, 3 and 8 located inside the palisade and Areas 4, 5, 6, 7 and 9 located outside the palisade. Again, these areas are arbitrary and simply intended to reflect spatial distinctions grossly evident across the site map. They were not intended to be definable in any more rigorous manner, since the intent was really to try and understand general trends across the site rather than establish quantifiable measurements or associations feature by feature. It is understood that this arbitrariness could lead to debates about the soundness of the extent of a line for any group, or inclusion or exclusion of any feature, but my interest was more in general trends across space, and not treating these areas as formal, restrictive units. The limitations and utility of this approach are reviewed further in Chapter 4.

Figure 8 and Figure 9 illustrate the residential and non-residential areas so defined at the site and Table 5 lists the features associated with each area. Area 1 consists of 53 features and encompasses a large open "plaza" space inside the palisade. It is located immediately south of House 4, north of House 1, and is bounded by the palisade on the west side. Area 2 consists of 8 features and is located immediately east of House 2, between House 2 and the palisade wall. Area 3 consists of 17 features located inside the palisade. Area 3 is located south of House 1 and 2 and is bounded by the palisade wall to the south. Area 4 consists of 9 features and is located south of the palisade. Area 5 is a small cluster of 7 features located outside of the palisade, between Areas 4 and 6. Area 6 consists of 17 features and is located east of House 6 and west of Area 5. Area 7 consists of 8 features and is located directly south of Area 6.

Areas 8 and 9 represent “non-Areas.” Area 8 represents all features located inside the palisade that are not otherwise encompassed in a previously described area. This area consists of 37 features that fall outside of defined areas inside of the palisade. Area 9 represents the features located outside the palisade not captured in defined areas outside the palisade. Area 9 consists of 38 features. Areas 8 and 9 were added to ensure that potential trends were not missed among features not grouped together in smaller clusters, and to provide randomized control groups as a test against feature patterns emerging from designated non-residential areas. As such, Areas 8 and 9 are not labeled on maps, but for the sake of this analysis represent any features left out of specific areas.

The residential areas consist of five houses, with Houses 1 to 4 located inside the palisade and House 6 located outside the palisade.[1] House 1 consists of 8 features, with 7 located inside the house walls and one located outside the house. House 2 consists of 20 features, with 17 features located inside the house walls and three outside the house. House 1 and 2 are located in close proximity to one another in the southern portion of the site inside the palisade. House 3 consists of 10 features, with 3 features located inside the house wall and 7 outside the house. Two features, 115 and 116, located inside House 3 are hearths and are not considered part of this analysis. House 4 consists of 25 features with 23 located inside the house walls and two outside. House 3 and 4 are also located in close proximity to one another in the northern portion of the site. House 6 consists of 14 features, with 10 inside and four outside the house walls.

This analysis will allow me to determine if residential and non-residential feature distributions differ in terms of feature attributes, including depth, volume, stratigraphy, and artifact frequency. As the settlement pattern and resulting residential and non-residential areas of the Figura site are relatively well defined, this site and feature analysis has the potential to help determine spatial layout and possible feature function at other Western Basin sites that lack clear evidence of post molds or spatial clarity and distinction of activities across the site.

I should also mention that in a previous research orientation to this study focusing on the role of Feature 24 and possible ritual activities reflected in that feature, I noted that characteristics of feature form and content, from a small sample of features might indicate spatial patterning across the site. These characteristics were tied to a sample of large pits containing a large number of artifacts. While I ultimately chose to abandon this line of inquiry, those helped me to refocus and undertake the current analysis.

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[1] It should be noted that Golder Associates originally identified a partial House 5 at the north interior of the palisade, but given the clarity of settlement patterns for the site otherwise, I have chosen to reject that locale as denoting a house. Whether that area is indeed a house will be explored in detail in Chapter 4.

Figure 8: Figura Site Map Outlining Areas

Figure 9: Figura Site Map Outlining Areas with Colour

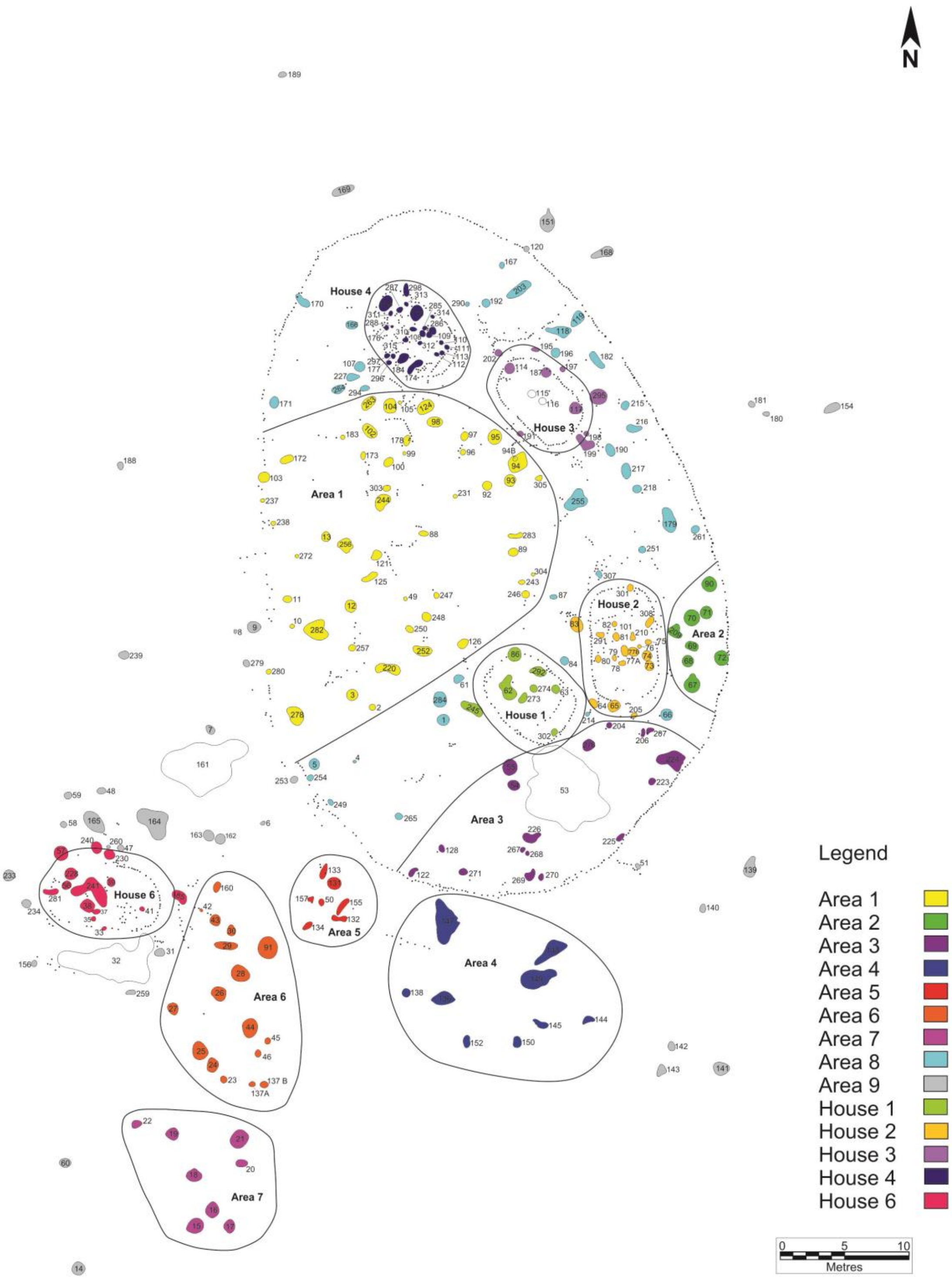

Table 5: Figura Site Features Associated with Each Area

Area	Associated Features	Total
1	2, 3, 10, 11, 12, 13, 49, 88, 89, 92, 93, 94, 95, 96, 97, 98, 99, 100, 102, 103, 104, 105, 121, 124, 125, 126, 172, 173, 178, 183, 220, 231, 237, 238, 243, 244, 246, 247, 248, 250, 252, 256, 257, 263, 272, 278, 280, 282, 283, 303, 304, 305, 94B	53
2	67, 68, 69, 70, 71, 72, 90, 209	8
3	54, 55, 122, 128, 204, 206, 207, 223, 224, 225, 226, 267, 268, 269, 270, 271, 276	17
4	136, 138, 144, 145, 147, 148, 149, 150, 152	9
5	50, 131, 132, 133, 134, 155, 157	7
6	23, 24, 25, 26, 27, 28, 29, 30, 42, 43, 44, 45, 46, 91, 160, 137A, 137B	17
7	15, 16, 17, 18, 19, 20, 21, 22	8
8	1, 4, 5, 61, 66, 84, 87, 107, 118, 119, 166, 167, 170, 171, 179, 182, 190, 192, 196, 203, 214, 215, 216, 217, 218, 227, 249, 251, 254, 255, 261, 264, 265, 284, 290, 294, 307	37
9	6, 7, 8, 9, 14, 31, 47, 48, 51, 58, 59, 60, 120, 139, 140, 141, 142, 143, 151, 154, 156, 162, 163, 164, 165, 168, 169, 180, 181, 188, 189, 233, 234, 239, 253, 259, 260, 279	38
House 1	62, 63, 86, 245, 273, 274, 292, 302	8
House 2	64, 65, 73, 74, 75, 76, 77A, 77B, 78, 79, 80, 81, 82, 83, 101[2], 205, 210, 291, 301, 308	20
House 3	114, 117, 187, 191, 195, 197, 198, 199, 202, 295	10
House 4	108, 109, 110, 111, 112, 113, 174, 175, 176, 177, 184, 185, 285, 286, 287, 288, 296, 297, 298, 310, 311, 312, 313, 314, 315	25
House 6	33, 35, 37, 38, 39, 41, 56, 57, 85, 228, 230, 240, 241, 281	14

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[2] Feature 101 was not drawn on any settlement pattern maps due to a mapping error in the field, but was located within House 2. Therefore F. 101 does not appear on any maps presented in this thesis.

3.3 Feature Attributes Analyzed Spatially

Relying on feature attributes consistently identified in previous research as significant in feature studies, and drawing on the insights of the feature typing exercise detailed earlier in this chapter, and on my earlier examination of a limited number of features from Figura, I chose to examine the following feature attributes across residential and non-residential areas of the site: feature depth, volume, stratigraphy, artifact frequency, and presence or absence of distinct artifact classes. I should also underscore that, as a result of the feature typing exercise that allowed me to remove Type C and E features (along with middens and hearths) from further consideration, the assemblage of features I will be examining for this spatial analysis consists of 271 features.

3.3.1 Depth

As noted previously, depth recorded for each feature is by no means understood to reflect the original, actual depth of each feature, considering that this site was topsoil stripped then shovel shined multiple times, so the depth is an arbitrary comparison of the remaining bottom portion of all features across the site; nonetheless this measurement still captured wide variation across Figura features. Depth was divided into five categories: 0 to 19.99cm, 20 to 39.99cm, 40 to 59.99cm, 60 to 79.99cm and 80 cm and over. These five categories were then grouped into three broader categories: shallow, medium and deep. Shallow features are defined as features between 0 and 19.99 cm, medium features are between 20 and 39.99 cm, and deep features are defined as 40 cm and over.[3] A depth of 40cm was selected as an arbitrary cut off point, but I felt that while all features represent intentional construction, a feature well over 40cm in depth after previous impacts of topsoil stripping and shovel shining would have required foresight, planning and considerable energy to dig – not to mention the need to avoid the feature once constructed – and thus were most likely dug by someone with a clearly defined reason and function in mind. The

[3] Note that, despite the grouping of attributes into three categories for comparison, site maps in Chapter 4 depicting these attributes spatially reflect all five measurement categories defined here. This is the practice I followed for all attributes that were grouped.

number of shallow, medium and deep features per area were then mapped, counted and shown in a ratio and percentage within and across areas.

3.3.2 Volume

Volume was chosen for analysis as the volume of a feature most accurately accounts for the oddities of pit plan and profile (Stewart 1975:126). As noted above, the volume recorded for each feature also does not represent the original, actual volume of the pit, so these measurements represent a comparison of the remaining bottoms of all features across the site. As such, volume was calculated using a basic formula of length by width by depth. Volume was divided into four categories: 0 to 99.99L, 100 to 499.99L, 500 to 999.99L and 1000L and over. These four categories were then grouped into small, medium and large categories; with small features defined as 0 to 99.99L, medium as 100 to 499.99L and large features as 500+L. Again, the number of small, medium and large features per area were mapped, counted and shown in ratio and percentage within and across areas.

3.3.3 Stratigraphy

The number of layers evident in feature profiles was chosen for analysis as stratigraphy can reflect the duration or age within which the feature operated, or the intensity of activity that feature was subjected to in an area (Dunham 2000:236). Layers are defined as strata of soil that extends from one side of the feature to the other. Lenses and slumpage were not considered layers. The number of layers were divided into four categories: 1 and 2 layers, 3 layers, 4 layers and 5 layers. These four categories were then grouped into a single and multiple category, with single defined as features with one or two layers and multiple defined as features with three or more layers. The logic of this distinction reflects the fact that large features can be abandoned, rather than intentionally filled, creating a two strata profile that consists of a use layer, and then a mostly sterile, post-use infill over time, or after clearance and cultivation (e.g., Kenyon et al. 1988; Lennox 1982; Murphy and Ferris 1990). Again, the number of single and multiple features per area were mapped, counted and shown in ratio and percentage within and across areas.

3.3.4 Artifact Frequency

Artifact content was chosen to analyze because it has been identified as an important criterion that can indicate activities that took place in and around that pit (Moeller 1991; Stewart 1975), the social use of space (Means 2000), as well as waste streams at a site (Timmins 1997). At the Figura site artifact material classes include ceramics, lithics, faunal and other. These classes are broken down into smaller categories of artifacts and are based on the analysis provided by Golder and were not modified for this analysis. Table 6 provides a list of all the artifact classes and categories present in the features from the site.

For this analysis, artifact counts for features were totaled and this provided the artifact frequency for each feature. Charcoal and fire cracked rock were not included in the artifact total, as they were not consistently collected or recorded in the field. Artifact frequency was divided into five categories: 0 to 24 artifacts, 25 to 149, 150 to 499, 500 to 999 and 1000 and over. These five categories were further grouped into three broad categories, low, medium and high artifact frequencies. Low artifact frequencies are defined as 0 to 24 artifacts, medium as 25 to 149 artifacts and high artifact frequencies are 150+ artifacts. Artifact frequency was divided into these categories as they likely encompass the spectrum from casual or unintentional to purposeful or intentional artifact disposal. Features with 0 to 24 artifacts are essentially empty, 25 to 149 artifacts per feature likely represents activity or proximity related, expedient artifact disposal and 150 artifacts and over likely represent intentional trash disposal locations or events. Artifact frequencies per feature per area were then mapped, counted and shown in ratio and percentage within and across areas.

3.3.4.1 Other Artifact Analysis

As artifact frequency is a large, somewhat arbitrary category specific content quantities were also teased out. The artifact categories analyzed in more detail were tools, number of ceramic vessels, and artifacts as refuse.

Table 6: Figura Site Artifact Classes and Categories
* Indicates that this artifact is a formal tool (n=13)

Ceramic (14)	Pipes (5)	Lithic (16)	Faunal (4)	Other (3)
Basal Sherd	Pipe Stem	Biface*	Antler Flaker*	Carbonized Plant Remains
Body Sherd	Pipe Bowl	Celt*	Bone Awl*	Red Ochre
Ceramic Disk	Pipe Fragment	Chipping Detritus	Faunal Remains	Yellow Ochre
Complete Pot	Pipe Contents	Drill*	Modified Bone Fragment	
Fragmentary Neck Sherd	Juvenile Pipe	Graver*		
Fragmentary Rim Sherd		Hammer/Anvil Stone*		
Fragmentary Sherd		Metate		
Juvenile Vessel		Miscellaneous Ground Stone		
Fragmentary Shoulder Sherd		Miscellaneous Modified Rough Stone		
Lump of Clay		Perforator*		
Neck/Shoulder Sherd		Projectile Point*		
Neck Sherd		Retouched Flake*		
Rim Sherd		Scraper*		
Shoulder Sherd		Strike-a-light		
		Utilized Flake*		
		Wedge*		

Tools were chosen because I wanted to explore if tools were found in specific areas of the site in higher frequencies, and if this can help reflect tool associations with particular residential and non-residential areas at the site. Tools include bifaces, celts, drills, gravers, hammer/anvil stones, perforators, projectile points, retouched flakes, scrapers, utilized flakes, wedges, antler flaker and bone awls. The number of tools per feature were counted and then divided into three categories: low, medium and high tool frequencies. A low tool frequency was defined as two or fewer tools, medium as three to five tools and high tool frequency was six or more tools per feature. Features with zero tools were also noted.

The number of ceramic vessels present in a feature was chosen for analysis because the initial analysis of the site (Golder 2012) indicated that formally identified vessels appeared to have been more commonly deposited in certain features than others. Vessels were defined in the original analysis as mainly comprised of rim sherds, either a single decorated rim sherd or multiple rim sherds, as well as some fragmentary rim sherds and clearly related neck sherds. In cases where the same vessel was identified in multiple features, the vessel was counted for all the features it was found in. Low vessel counts per feature were defined as a feature having one to three vessels, medium vessel counts have four to five vessels per features and high vessel counts was defined as having six or more vessels per feature.

A ceramic cross mend analysis was also performed for the entire site to help determine the spatial distribution of materials across the site, and potential spatial relationships. Ceramics account for 37% (n=14 796) of the total artifact assemblage from the Figura assemblage and forms the largest dataset from the Figura site (based on the Golder catalogue; Golder 2012). In all, 241 vessels were initially identified at the Figura site based on visual similarities of rim sherds by Golder Associates (2012), with a vessel ranging from a single decorated rim sherd to a complete pot. As ceramics formed the largest material data set from the site, a cross mend analysis would help examine the relationships among features and areas based on ceramic vessels. Ceramic vessels found in different features can indicate features that were opened at the same time across a site (Cunningham 1999:33; Moeller 1992:43; Timmins 1997).

The number of artifacts and remains that could be classified as refuse per feature was chosen for analysis as it was thought that the amount of refuse in a feature might be an indication of proximity to residential or non-residential areas and associated activities across the site (Hayden and Cannon 1983; Schiffer 1977). Refuse includes artifact categories that represent waste, such as chipping detritus, ceramic sherds and faunal remains, as they are either byproducts of lithic tool manufacture or animal processing for food, or broken objects without further utility. The amount of refuse per feature was counted and then grouped into three categories: low, medium and high refuse frequencies. Low refuse frequencies were defined as features with 1 to 49 pieces of refuse, medium as 50 to 99 pieces of refuse and high as 100 or more pieces of refuse.

I also expanded on Golder's ceramic vessel cross mend analysis. Cross mends are based on physical and inferred mends of sherds from the same vessel. Physical mends are based on sherds that physically fit together. Inferred mends are based on close similarity of decorative motif, decorative technique, tool use, location of decorative motif and technique, thickness, paste, use wear, and colour (Cunningham 1999; Howie-Langs 1998; Retter 2001). A minimum of three criteria for inferred mends were used to confirm an inferred mend for a vessel.

Cross mending consisted first of sorting distinct vessels from the feature they were found in. After this was completed, features were grouped based on their location at the site (i.e., by houses, area outside the palisade, plaza like area inside the palisade). This was done for ease of cross mending, as this allowed me to easily spot initial cross mends between features located in close proximity to one another. This proved not as fruitful as I initially thought, as cross mends were not limited to specific areas at the site. When mends were found between existing vessels, the new vessel assumed the vessel number of the smaller vessel designation. For example, Vessel 134 from Feature 5 mends with Vessel 13 from Feature 1, resulting in the new vessel number Vessel 13.

A complete cross mend analysis was beyond the scope of this thesis, so only rim and fragmentary rim sherds were cross mended to better understand the spatial patterns and feature relationships at the site.

3.4 How Feature Areas are Analyzed

For this thesis feature depths, volume, number of layers and artifact frequency were divided into two or three categories, based on size or frequency. The number of features in each size category was recorded and shown in two forms: ratio and percentage. The ratio presents each characteristic in numerical format with one category set to 1 and demonstrates the differences or similarities in the number of features for each previously defined feature area across the site. The percentage presents each characteristic as the percentage each category represents in that area. For example, if an area has 2 shallow features, 3 medium features and 5 deep features, it will be shown as 0.4:0.6:1 in ratio form and 20%:30%:50% in percentage. These ratios and percentages can then be compared to other areas of the site. I relied primarily on comparing percentages of feature attributes between areas, since this proved effective at drawing out broad trends across the different residential and non-residential areas of the site I had identified, and between the readily definable area inside and outside the palisade.

Chapter 4 will present the results of the spatial analysis of feature attributes from Figura and some interpretations of the features from the site.

Chapter 4

4 Feature Spatial Analysis and Discussion

In this chapter I present a description and the results of the spatial analysis performed on the features from the Figura site, as grouped into the nine residential and non-residential areas across the site discussed in Chapter 3. Based on my consideration of other feature typology studies, and characteristics of the features from Figura reviewed in Chapters 2 and 3, I chose to examine depth, volume, pit fill stratigraphy, and artifact content, to determine if patterns could be identified from the features at this site, and specifically if residential and non-residential areas could be distinguished from each other. A ceramic cross mend analysis is also discussed. Appendix B lists all feature attributes discussed in this thesis.

4.1 Depth

The first feature characteristic examined was feature depth. This was based on depth measurements provided in the consultant report, and the already mentioned caveats in Chapter 3 about the limitations of measurements from a stripped and shovel shined site should be recalled here.

As reviewed in Chapter 3, to orderly sort feature depth data, a series of five categories of depth were established (see Table 7). The creation of these five categories was an arbitrary number to less distinguish “types” of features by this one criterion, and more a means of sorting points along a continuum that groups similar depths from more different depths.

I also wanted to then sort these categories further, since I feel it is reasonable to assume that the creation and planning of a rather shallow feature might not reflect the same degree of undertaking and intent as digging a feature up to a meter in depth. As such, “depth” as an attribute was divided into three broad categories: shallow, medium and deep pits. Shallow pits were defined as features 19.99 cm and under, medium features are between 20.00 cm to 39.99 cm, and deep features are defined as features over 40.00 cm in depth. I fully acknowledge that these measurements are arbitrary and not hard distinctions. Table 7 illustrates that shallow features are the most common at the site, and that “non-deep” features (shallow and medium), at

76%, are much more common on the site than deep features. Table 8 shows the breakdown of depth categories per area at the site and Figure 10 illustrates those categories visually.

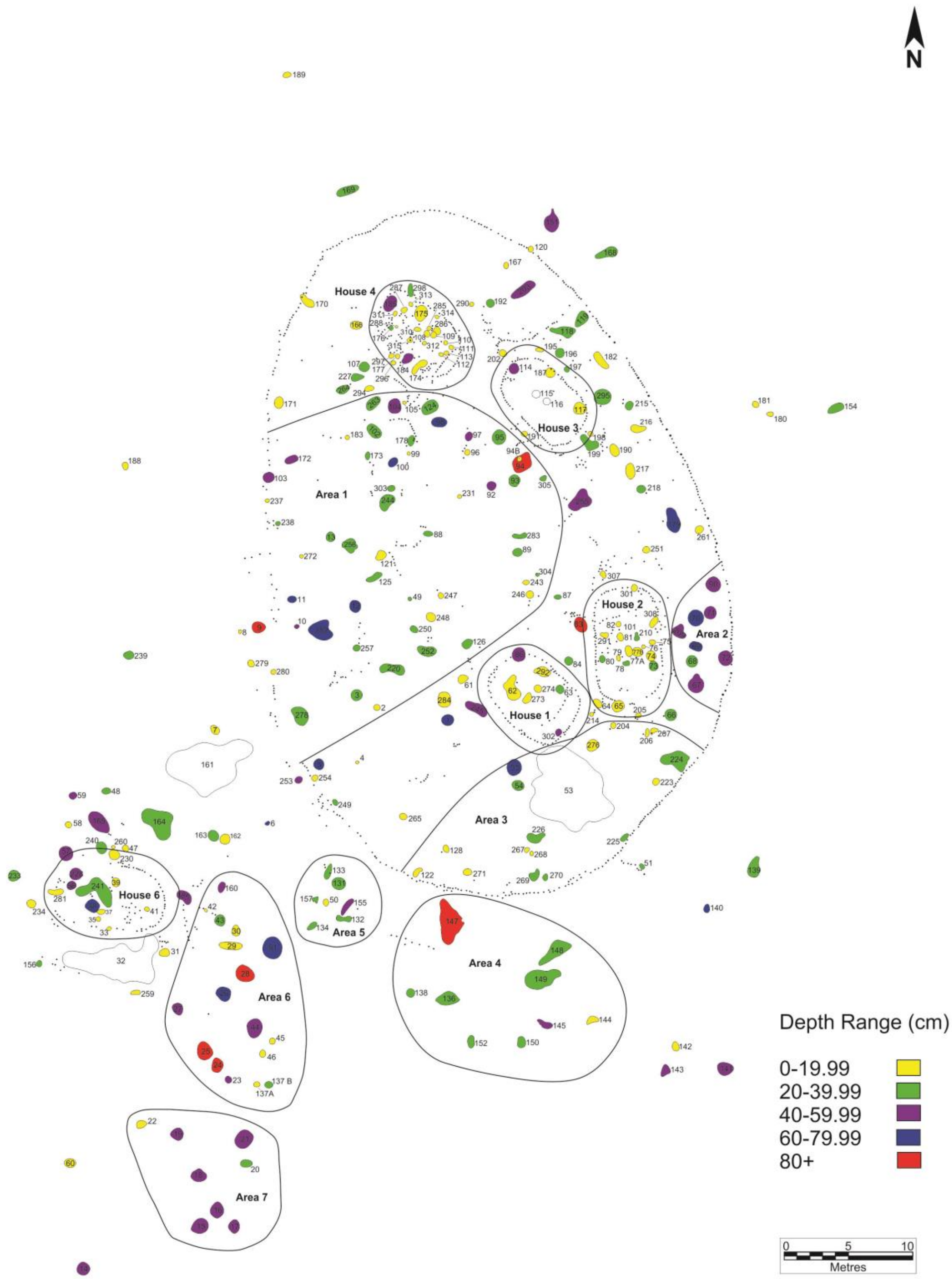
Table 7: Figura Site Feature Depth Category

Depth Range	Category	Number of Features	Percentage
0-19 cm	Shallow	123	45
20-39 cm	Medium	83	31
40-59 cm	Deep	42	15
60-79 cm		16	6
80+ cm		7	3

Table 8: Figura Site Feature Ratio of Shallow to Deep Pits per Area
(note: Percentages are based on total number for an Area. Ratios are based on total numbers for an area, with "Deep" features providing the constant).

Area	Shallow	Medium	Deep	Total	Ratio	Percentage of shallow: medium: deep
1	15	26	12	53	1.25: 2.1: 1	28: 49: 23
2	0	1	7	8	0: 0.14: 1	0: 12: 88
3	10	6	1	17	10: 6: 1	59: 35: 6
4	1	6	2	9	0.5: 3: 1	11: 67: 22
5	1	5	1	7	1: 5: 1	14: 71: 14
6	6	2	9	17	0.66: 0.22: 1	35: 12: 53
7	1	1	6	8	0.16:0.16:1	12.5: 12.5: 75
8	19	13	5	37	3.8: 2.6: 1	51: 35: 14
9	17	11	10	38	1.7: 1.1: 1	45: 29: 26
H1	4	1	3	8	1.3: 1: 1	50: 12: 38
H2	15	4	1	20	15: 4: 1	75: 20: 5
H3	6	3	1	10	6: 3: 1	60: 30: 10
H4	21	2	2	25	10.5: 1: 1	84: 8: 8
H6	7	2	5	14	1.4: 0.4: 1	50: 14: 36

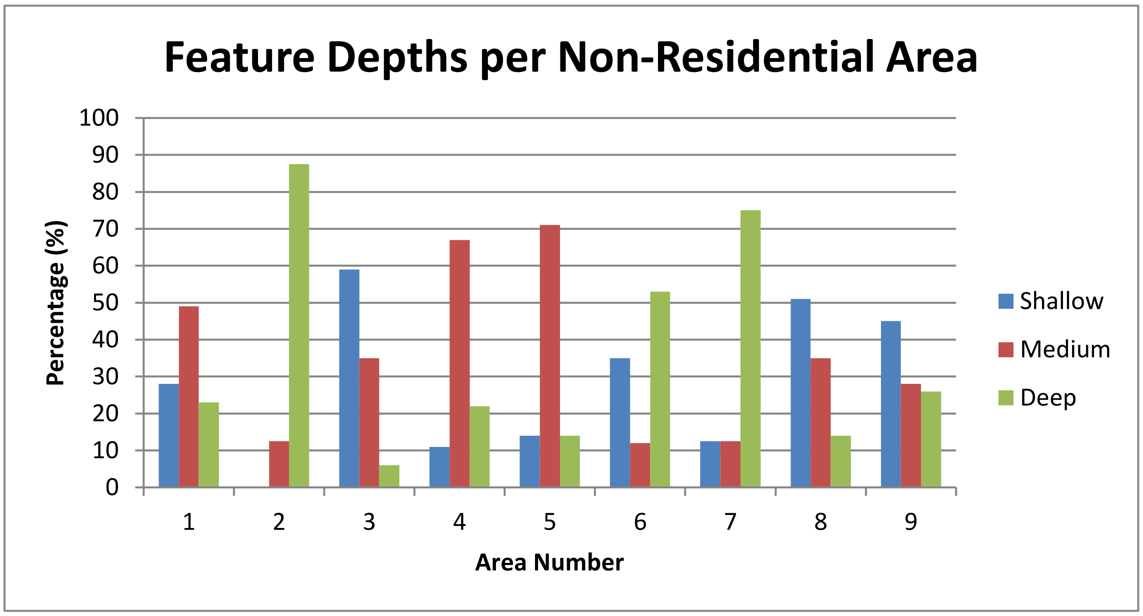
Figure 10: Figura Site Feature Depth Ranges



4.1.1 Non-Residential Areas

When looking at the non-residential areas of the Figura site, Areas 1, 4 and 5 had predominately medium depth features, non-Areas 8 and 9 had similar percentages of feature depths, Areas 2, 6 and 7 had predominately deep features, and Area 3 has predominately shallow features. Figure 11 illustrates the differences in percentage for shallow, medium and deep features per non-residential area graphically.

Figure 11: Figura Site Feature Depths per Non-Residential Area Graph



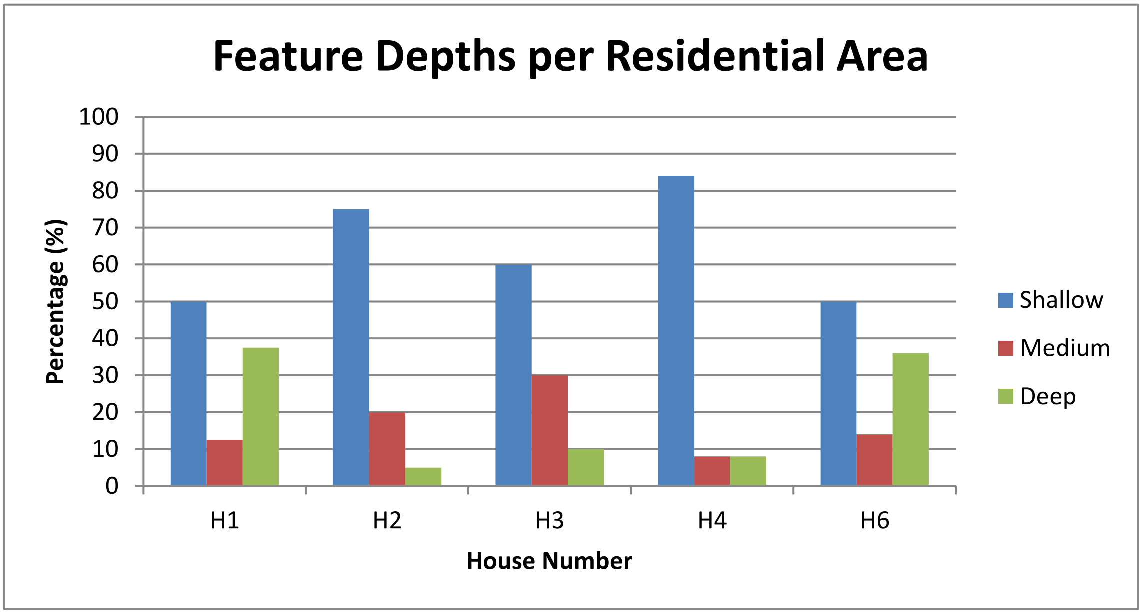
Areas 2 and 7 are notable by their predominance of deep features, something also evident in Area 6, though the predominance of deep pits there is muted by the presence of several shallower pits at the north and south periphery of Area 6. Exterior to palisade Areas 4 and 5 are dominated by medium depth features (67% and 71%, respectively), as is Area 1 at 49%, though that interior to palisade area seems to also encompass spatial differences, as reflected by a higher frequency of deeper pits on the periphery of the area, and mostly adjacent to Houses 3 and 4. Area 3 is the only area where shallow pits dominate, other than for the control group of non-Areas 8 and 9, and this similarity may suggest that either Area 3 is not really a meaningful feature space on the site, or captures similar activities carried out more diffusely across the site.

Across the seven non-residential feature clusters, the ratio average between small, medium and deep pits is 29%:40%:32%, while that ratio average for non-Areas 8 and 9 is 48%:32%:20%. Assuming the non-Areas encompass either random pit placements or arbitrarily captures finer spatial clustering, then the fact that there is a difference between "Areas" and "Non-Areas" underscores some degree of patterned logic, by pit depth at any event, in these clustered areas that in turn influenced where shallow, medium and deep pits tend to show up across the Figura site.

4.1.2 Residential Areas

All five residential areas show a predominance of shallow features, ranging from 50% in Houses 1 and 6, to 84% in House 4, as shown in Table 8 and illustrated in Figure 10. Figure 12 illustrates the differences in percentage for shallow, medium and deep features per residential area graphically.

Figure 12: Figura Site Feature Depths per Residential Area Graph



Feature depth range variations were generally more uniform in residential areas, as shown in Figure 10. Houses 2 and 3 both have only one deep pit, either outside but close in the case of House 2, or at one end of the house in the interior for House 3. House 1 had 3 deep pits, however the one in the interior included human remains, and a second one intersects the wall of the house, so may post-date the house (or was a feature built purposefully into the wall of the structure), so it is possible that House 1 also only had a single deep feature associated with it. House 4 has by far the highest concentration of shallow features, at 84%. It is worth noting, however, that the north half of the house floor of this structure was slightly stratified with a mix of ash, fired soil and swirls of dark soil located above a house floor of features. Excavators at the time thought that this residential structure may have been subject to a fire, or was used as a kind of sweat house (Neal Ferris, personal communication 2013). Regardless, House 4 has the largest number of features recorded for any of the five house areas, and it may be that some of the shallow features recorded for this house may have been related to a post-residential use of the structure.

Assuming all three deep features were an intentional part of House 1, it exhibits similar percentages of shallow and deep features to House 6. House 6 has the greatest number of deep features of all houses with five. The deepest feature is located within the house, while the others are located along the edge of the house or outside the house. It is worth noting, however, that the western edge of this house is somewhat obscured, and a concentration of features immediately to the north may suggest some of the features associated with this area may in fact be part of a pit cluster to the north of the house, that may or may not have been contemporaneous with the occupation of House 6.

Across the five residential feature clusters, the ratio average between small, medium and deep pits is 68%:16%:16%. This average is quite different from non-residential areas, and non-Areas 8 and 9, indicating that shallower features are much more commonly found in residential locales. At the very least, it suggests some intentional difference in feature placement between what are clearly visible as residential areas within the settlement patterns of the Figura site, and what are not.

4.1.3 Depth Summary

When looking at the ratios of shallow, medium to deep features at the site, it can be noted that shallow, medium and deep features can occur in the same locations, as most of the defined areas across the site contains at least one shallow, one medium and one deep feature. It also appears that deep features occasionally cluster together, as seen in Area 2, 6, and 7, and perhaps in the north-easterly end of Area 1. It may also be that a previously unrecognized area of deeper pits may be located across the western end of House 6 and extending north, similar to other deep pit concentration areas, and may either pre or post-date House 6. The concentration of deeper pits, and presumably the activities requiring use of deeper pits (typically thought to be related to caching or deep storage needs; e.g., Murphy and Ferris 1990), were intentional occurrences outside of residential areas, and tended to predominate those non-residential areas of the site where they cluster. This is reminiscent of the pattern of deep pit clustering also noted for Leamington area Western Basin sites dating to the same period (as reviewed in Murphy and Ferris 1990).

Interestingly, Area 2, located between House 2 and the palisade, occurs in a relatively secluded area of the site, which may suggest a private or sheltered need or possession of that space (and presumably of the contents of those features when in use), while Areas 6 and 7 are external to the palisade, suggesting either such privacy was not needed in those areas, or that privacy or possession was achieved by virtue of being on the other side of the palisade. The absence of shallow pits around these deep pit concentrations, an otherwise ubiquitous feature depth type across other areas, suggests minimal need for the functions these kinds of pits provided in those areas. The proximity of Houses 6 and 2 to these respective areas may or may not suggest possible affiliations or ownership to these clusters. Since so many deep features are located in close proximity to each other in these areas, it could suggest that storage pits either were dug at the same time to provide large scale caching or storage, or sequentially dug to serve the same purpose, codifying the distinct feature pattern for these areas by the tendency over time over replacing a deep pit with another at that location.

For non-residential areas of the site where few deep features are present, including Areas 3, 4, 5, as well as portions of Area 1, it is tempting to suggest that this general pattern of variable feature depths with few deep pits occurred because of a broad pattern of similar feature uses occurring in these spaces. The assumption thus would be that these spaces encompassed a range of daily activities such as food processing/preparation, material manufacture or maintenance, and general, open space residential activities and living, all of which requiring variable numbers of mostly shallower pits. This would also suggest that spatial use, whether inside the palisade. an open plaza-like space, or along the exterior of the palisade, occurred either at different times during the life of the settlement, or by differing inhabitants doing the same range of activities at the same time but occupying distinct social spaces across the settlement. It is also worth noting, following this line of thought, that the space between the palisade and House 3, extending towards House 2, currently lumped into non-Area 8, by feature depth does exhibit similar feature patterning to that seen for non-residential Areas 1, 3, 4, and 5, so perhaps similar activities to those areas were taking place here.

All five residential areas had a minimum of one deep pit associated with the house, though in most instances these deep pits are typically not the very deepest category of pits recorded for the site. House 2 lacks any deep pits inside the walls of the structure, but does have a very deep feature immediately outside the house, and is in direct proximity to deep feature Area 2. House 1 may also lack any deep pits inside the structure, depending on associations with the burial pit and pit in the wall of the structure. In general, it is possible to suggest that the need for deeper pits inside houses was restricted and generally served by one or two such pits, or by proximity to deep pits immediately outside the house. If the latter is the case, it may be that some or all of the deep features on the northeast periphery of Area 1 may in fact be better thought of as belonging to House 3, and possibly House 4 (but see discussion in section 4.6 of this chapter). It is also worth noting that Murphy (1991), observed a similar, single deep pit association with a single house of similar dimension, during his excavations of the Sherman site.

Overall, feature depth, and tendencies in the patterns of feature clustering by depth, does reveal some general patterns across the site. This trend suggests that the definition of non-residential areas for this study, while certainly arbitrary and subject to debate as to where boundaries should be drawn, nonetheless has captured some general patterning as distinct analytical units for understanding feature patterning at Figura.

4.2 Volume

A second feature attribute examined was volume, which considers depth, but further refines that single attribute by also calculating length and width to come up with a measurement of classification. All measurements were taken directly from the consultant's report. Volume was originally organized into a series of four measurement categories (see Table 9) and then divided into three groupings: small, medium and large volume pits. Small feature volumes were defined as 99.99L and under, medium volumes are 100 to 499.99L and large features are defined as those over 500L in volume. Again, while certainly an arbitrary distinction, I chose these categories to best represent potential variation in feature patterning, under the assumption that differently sized pits potentially had different intended functions. The nine non-residential and five residential areas are described in the sections below. Table 10 shows the breakdown of volume categories per area at the site and Figure 13 illustrates the categories visually.

Table 9: Figura Site Feature Volume Ranges

Volume Range	Category	Number of Features	Percentage
0-99.99 L	Small	134	49
100-499.99 L	Medium	87	32
500-999.99 L	Large	24	9
1000+ L		26	10

4.2.1 Non-Residential Areas

When looking at non-residential areas, it is evident that feature types by volume vary greatly across the site. Small volume features range from 0 to 59%, medium ranges from 25% to 60%, and large features range from 11% to 62.5%. These numbers are presented in Table 10 and displayed in graph form in Figure 14.

Figure 13: Figura Site Feature Volume Ranges

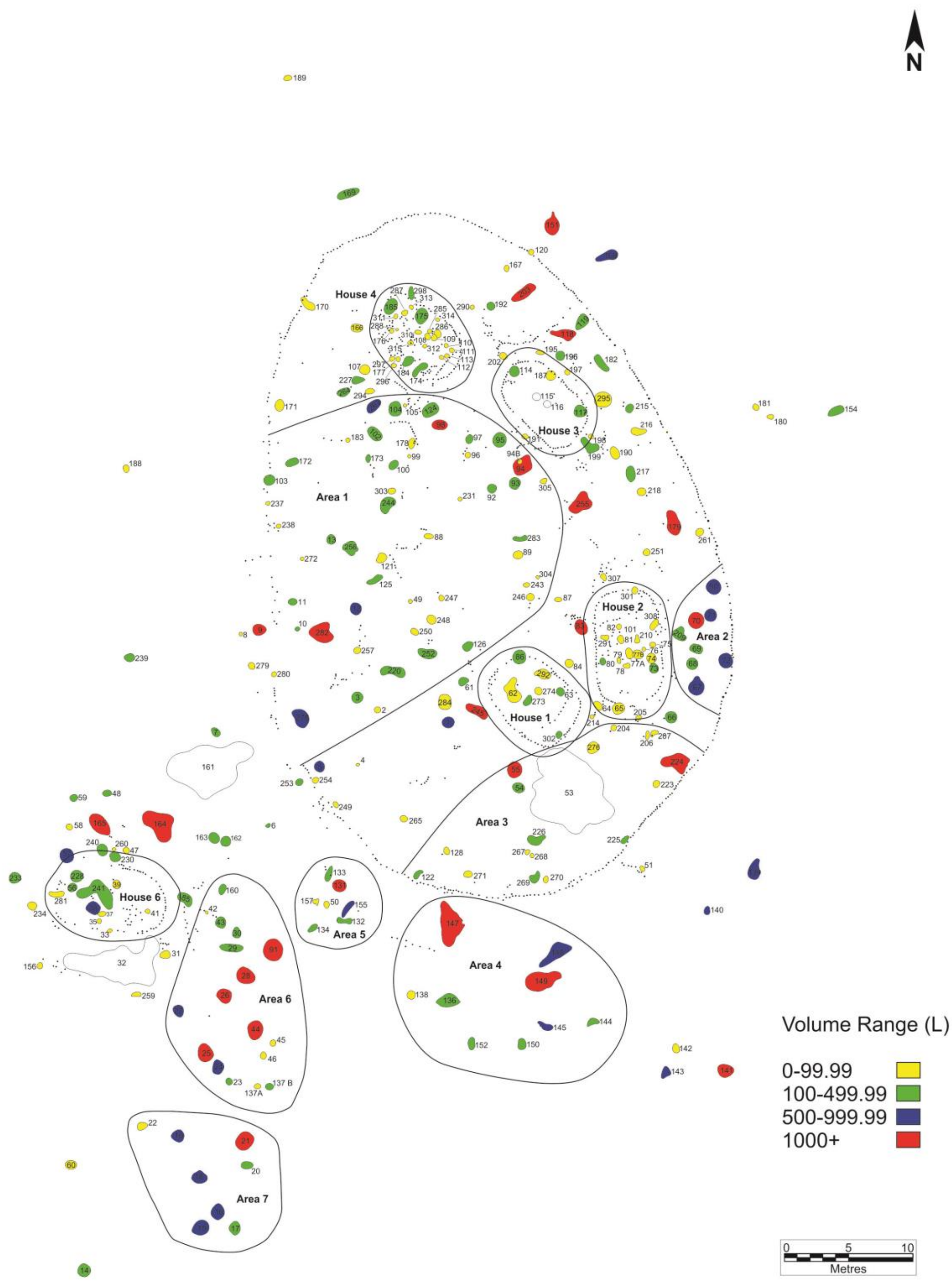
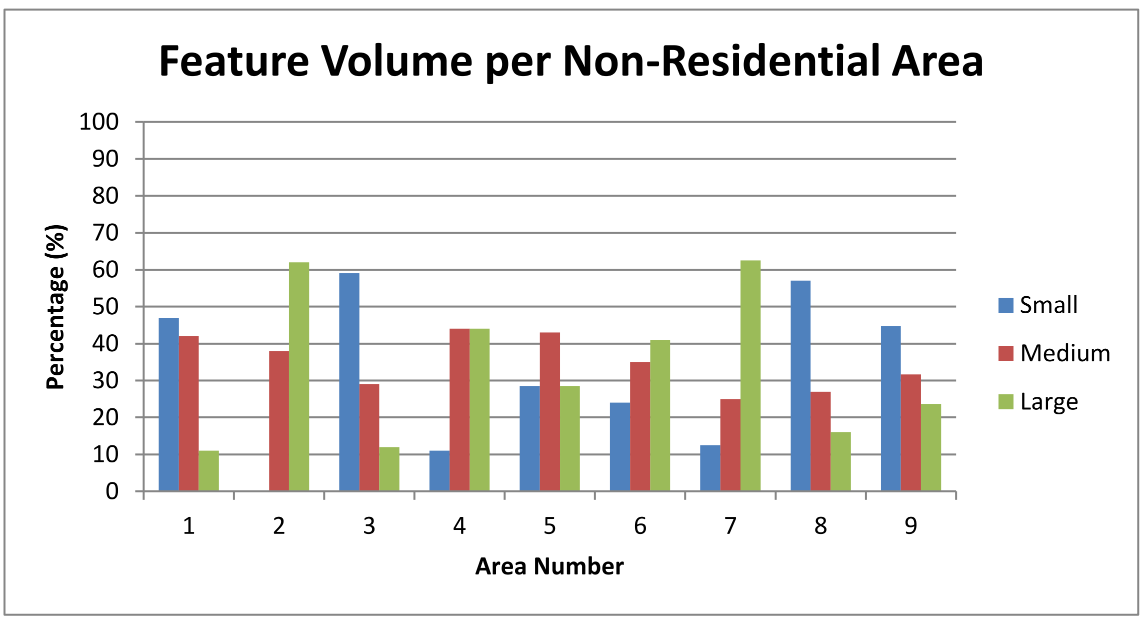


Table 10: Figura Site Feature Ratio of Small to Medium to Large Volume Pits per Area

Area	Small	Medium	Large	Total	Ratio	Percentage of small: medium: large
1	25	22	6	53	4.1: 3.6: 1	47: 42: 11
2	0	3	5	8	0: 0.6: 1	0: 38: 62
3	10	5	2	17	5: 2.5: 1	59: 29: 12
4	1	4	4	9	0.25: 1: 1	11: 44: 44
5	2	3	2	7	1: 1.5: 1	28.5: 43: 28.5
6	4	6	7	17	0.57: 0.85: 1	24: 35: 41
7	1	2	5	8	0.2: 0.4: 1	12.5: 25: 62.5
8	21	10	6	37	3.5: 1.6: 1	57: 27: 16
9	17	12	9	38	1.8: 1.3: 1	45: 32: 24
H1	3	4	1	8	3: 4: 1	38: 50: 12
H2	17	2	1	20	17: 2: 1	85: 10: 5
H3	7	3	0	10	7: 3: 0	70: 30: 0
H4	20	5	0	25	20: 5: 0	80: 20: 0
H6	6	6	2	14	3: 3: 1	43: 43: 14

Figure 14: Figura Site Feature Volume per Non-Residential Area Graph



In looking at specific non-residential areas of the Figura site, the frequencies of small, medium and large volume features for Areas 1 and 3 most closely mirrors non-Areas 8 and 9, in the sense that small volume features are most common, followed by medium and large volumes, presumably reflecting the non-differentiated and multiple activities that were occurring across these spaces of the site. Area 5 is marked by a predominance of medium volume features, while Area 4 has the same percentage of medium and large volume features. Areas 2, 6, and 7 are marked by a predominance of larger volume features, though Areas 2 and 7 are much more marked in that regard, and even Area 4 has a slightly higher percentage of large volume features than Area 6, because of more small volume features being present in Area 6. Clearly the smaller pits in the northwest and southeast of Area 6 are different than the larger pits in the centre of that area, suggesting possible distinct activities occurring across the Area, or even that, perhaps, the northern cluster of medium sized pits might better be thought of as connected to House 6 activities, rather than Area 6.

When looking at Area 1, small and medium volume features are present throughout the area, and these feature distinctions even cluster together in some locales, while the few large volume features present are located at the west end by the palisade, or near House 3 and 4. Area 3 was also dominated by small volume and a few medium volume features, all spread out across the area. As a general impression, while small and medium volume features regularly appear in proximity to each other, features with large volumes tend to be less randomly intermixed with smaller volume features, and when large volume features cluster, they tend to cluster with features of similar volumes. This may suggest that, while large volume pits serve a distinct function, the difference between medium and small volume features may be more arbitrary than meaningful.

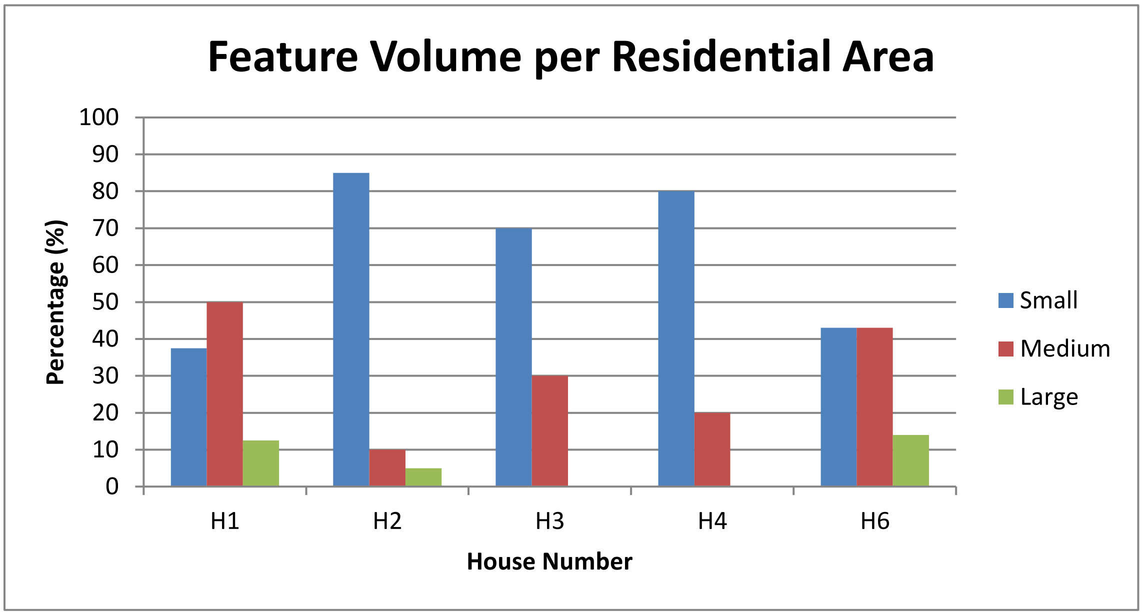
Across the seven non-residential feature areas, the ratio average between small, medium and large volumes is 36%:38%:26%, while that of non-Areas 8 and 9 is 51%:29%:20%.

4.2.2 Residential Areas

The majority of residential areas at the site were predominately composed of small volume features, with only House 1 having more medium volume features than small volume features.

Few large volume features were present in any of the houses, with House 3 and 4 lacking this category altogether. The percentage of features by volume for residential areas is graphed in Figure 15. Across the residential feature clusters, the ratio average between small, medium and large volume pits is 69%:26%:5%, which is quite distinct from any of the non-residential areas or control areas.

Figure 15: Figura Site Feature Volume per Residential Area Graph



4.2.3 Volume Summary

When analyzing features by volume, as with the feature depth attribute, small, medium and large volume features generally appear together in residential and non-residential areas of the site, with only non-residential Area 2 lacking any small volume features, and only Houses 3 and 4 lacking large volume features. Features by volume sizes across the site have an overall percentage ratio of 49%:32%:19%. In general, non-residential areas are dominated by equal percentages of feature sizes while residential areas predominately have small volume features.

The greatest variation noted between feature volume and feature depth attributes appears to be in the frequencies of medium volume features in given residential and non-residential areas. This likely is accounted for by volume being a better consideration of feature size by accounting for plan with depth (i.e., shallower features with large plans can have large volumes). However, the volume attribute did not alter overall general pattern differences between residential and non-residential areas, or among general feature tendencies seen for each area. So volume can be better at capturing real difference in feature size when considering loss of the upper portion of those features due to cultivation and topsoil stripping. Most importantly, medium volume variation from medium depth variation likely underscores both the real difference between small/shallow and large/deep features, as well as the fact that the distinction between these is relatively arbitrary. In other words, at a certain point, a large, deep feature becomes a distinct thing from other types of features, but it is not possible to point to an exact volume or depth marker to uniformly classify that distinction.

4.3 Feature Stratigraphy

Given that the number of layers in a feature can reflect the age of the feature or the intensity of activity occurring in an area (Dunham 2000:236), this criterion was also selected for the analysis of features across the Figura site. The number of features by one or more stratigraphic layer (as defined in Chapter 3) were counted for the site (see Table 11). These were then grouped into two categories; with small defined as features with one or two layers, and large defined as features with three of more layers. The logic of this distinction was to capture the fact that features with no (i.e., 1 layer), or just a single additional stratigraphic layer reflects largely single use pits, with the upper layer likely reflecting post-use intentional or unintentional infilling, occurring at any point after the pit was no longer needed, or after the site was no longer in use, as has been pointed out previously (e.g., Ferris 1990; Lennox 1982; Murphy and Ferris 1990). In effect, it is when a feature exhibits three or more layers that multiple use episodes for that feature is evident. The number of features by layer per area are tallied in Table 12 and illustrated in Figure 16. The immediate effect of this categorization is the fact that, overall, only 9% of features on the Figura site exhibit multiple stratified layering, with the overall ratio of single to multiple stratified features being approximately 11:1.

4.3.1 Non-Residential and Residential Areas

Of the non-residential areas of the site, only Areas 1 and 6 had more than two stratified features, while Areas 2 and non-Area 9 had two stratified features, and Areas 4 and 7 lacked any stratified features (Table 12, Figures 17 and 18). Within residential areas, three of the five houses (2, 4 and 6) had one feature with three or more layers associated with them. These features were located within one meter of the house for Houses 2 and 6, and along the house wall in House 4. It is worth pointing out that Houses 1 and 3 were also in close proximity to a single stratified feature, and in both cases just a metre to two beyond the limits of the defined House area.

Table 11: Figura Site Number of Stratigraphic Layers by Feature

Layers	Category	Number of Features	Percentage
1	Single	198	73
2		50	18
3	Multiple	14	5
4		8	3
5		1	<1

Table 12: Figura Site Feature Ratio of Small to Large Number of Stratigraphic Layers per Area

Area	Single	Multiple	Total	Ratio	Percentage of Single: multiple
1	46	7	53	6.6:1	87: 13
2	6	2	8	3:1	75: 25
3	16	1	17	16:1	94: 6
4	9	0	9	9:0	100: 0
5	6	1	7	6:1	86: 14
6	11	6	17	1.8:1	65: 35
7	8	0	8	8:0	100: 0
8	36	1	37	36:1	97: 3
9	36	2	38	18:1	95: 5
H1	8	0	8	8:0	100: 0
H2	19	1	20	19:1	95: 5
H3	10	0	10	10:0	100: 0
H4	24	1	25	24:1	96: 4
H6	13	1	14	13:1	93: 7

Figure 16: Figura Site Number of Stratigraphic Layers

Figure 17: Figura Site Number of Stratigraphic Layers per Non-Residential Area Graph

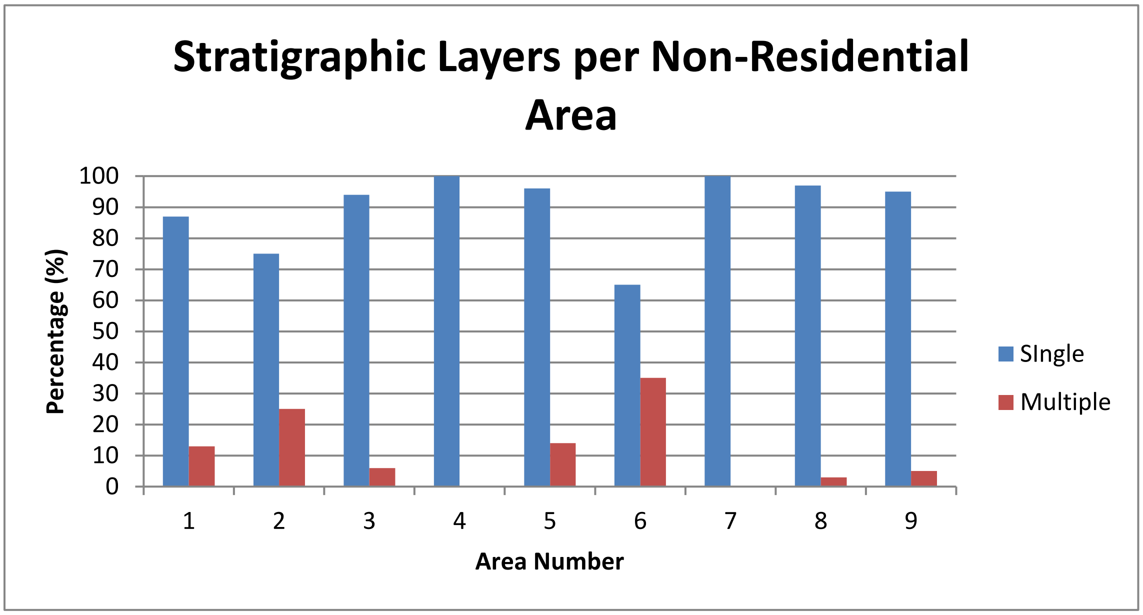
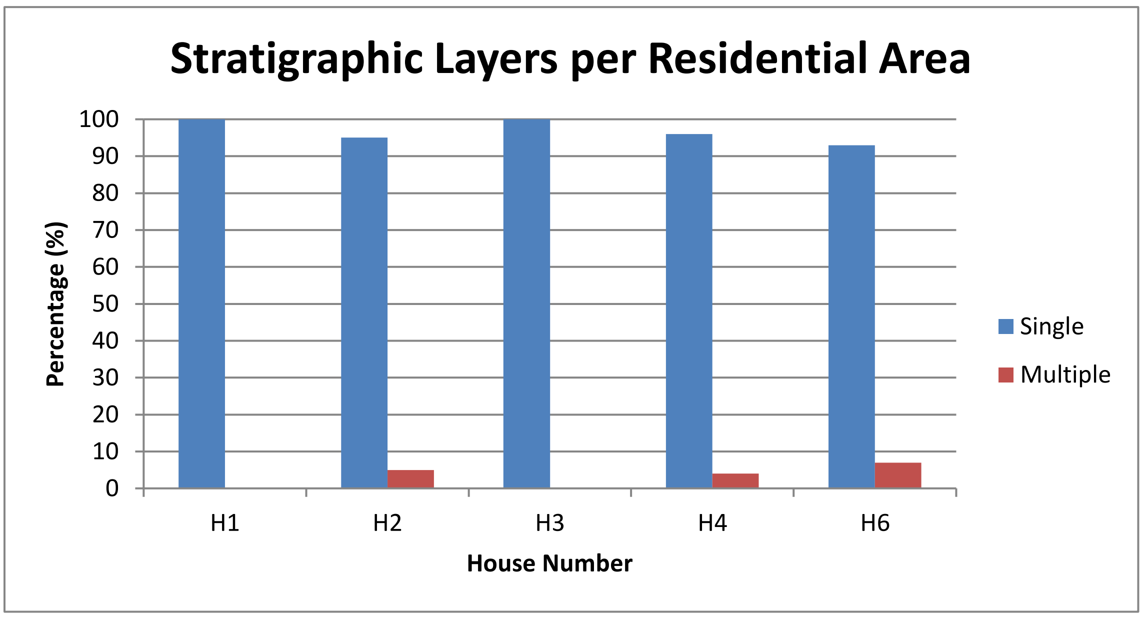


Figure 18: Figura Site Number of Stratigraphic Layers per Residential Area Graph



4.3.2 Feature Stratigraphy Summary

The presence of stratified features per non-residential and residential areas was not a very fruitful exploration of the site, as the majority of features have two or fewer layers. While that frequency limits the interpretive value of this attribute at the Figura site, it is worth pointing out some limited observations. First, it is worth noting that the highest concentrations of stratified features come from Areas 2 and 6, which by depth and volume are two areas with predominantly large features. Some of these stratified features may reflect multiple episodes of deposition tied to a single event. However, if we assume for a moment that these large features did function as storage or cache pits, the presence of stratified features in these areas may suggest some of these features experienced multiple uses over a longer period of use: either as a storage container requiring episodes of repair, or subsequent use as a place to dispose material, or as a result of the extraction of cached goods (e.g., food), leading to stratification, as has been observed in the archaeological record from more recent times (e.g., Dunham 2000; Ferris 2009). Interestingly, Area 7, also containing large features by volume or depth, contained no stratified features, which may suggest large features in that area only ever served one function.

It is also worth noting that only House 4 contained a stratified feature within its house walls (which may be associated with secondary uses of that structure, as noted previously). However, all houses, including House 4, either contain a stratified feature within the defined residential area beyond house, or are in very close proximity beyond that defined area to at least one stratified pit. This may suggest that single, stratified pits served individual house needs over the length of time those houses were occupied, generally located outside the house itself. An obvious speculation from this pattern would be that such features served as refuse pits for that house.

As Dunham (2000:236) notes, the number of layers in a feature can be an indication of the age of the feature or the intensity of activity occurring in an area of a site. Given that the only concentrations of stratified features at Figura are found in association with concentrations of large features, or in proximity to houses, it suggests that the relative life of the Figura site was relatively limited, at least to the extent of not requiring extensive re-use of features or feature areas, or need for many immediately exterior to house refuse pits, as also suggested by a general lack of feature overlap across the site.

4.4 Artifact Frequency

As noted previously, artifact frequency was chosen as an attribute to analyze as it can indicate activities that took place in and around that pit (Moeller 1991; Stewart 1975), the social use of space (Means 2000), as well as waste streams at a site (Timmins 1997). Artifact frequencies by feature were taken from the consultant report and data provided by Golder. For this analysis, artifact frequencies as reported by categories in the report were totaled and this provided the total number of artifacts per feature. Charcoal and fire cracked rock were not included in the artifact total, as they were not consistently collected or recorded in the field. Faunal remains were included in totals.

Frequency categories were established at 0 to 24 artifacts, 25 to 149, 150 to 499, 500 to 999, and 1000 and over (see Table 13). Of the 194 features containing 0-24 artifacts, it is worth noting that 67% (n=130) of those features contained 0 artifacts. The five categories were further divided into three broader groups: low, medium and high. Low artifact frequencies are defined as 0 to 24 artifacts, and are essentially empty, in that it is not possible to judge whether these many things or faunal remains were intentionally put into the feature, or whether they made it into the feature through various casual or unintentional means. The medium category encompasses 25 to 149 artifacts, which begins to encompass more than casual placement, and likely represents some kind of activity-related (i.e., intended) placement. The high category represents 150 artifacts or more, and either relates to intensive activity-related material disposal, or intentional trash disposal. Table 14 shows the breakdown of artifact categories per area at the site and Figure 19 illustrates the categories visually. As is readily evident, features with fewer than 25 artifacts dominate the feature assemblage at Figura, while features with more than 150 artifacts account for just over 15% of all features across the site. Note: House 1 includes a burial feature. During excavation the artifacts were kept with the remains and were reburied (see Golder 2012), so this feature was not included in the analysis of artifact counts.

Table 13: Figura Site Feature Artifact Frequency Ranges

Artifact Range	Category	Number of Features	Percentage
0-24	Low	194	72
25-149	Medium	34	13
150-499	High	23	9
500-999		11	4
1000+		8	3

4.4.1 Non-Residential Area

Non-residential areas at the site have predominately low artifact counts per feature, a pattern notably reversed for Areas 6 and 7, as seen in Table 14, displayed in graph form in Figure 20, and illustrated in Figure 19. Area 1, though predominantly consisting of low artifact frequency features, still had a relatively high number (23%) of high artifact frequency features, while non-Area 9 had a combined 24% of medium or high frequency features.

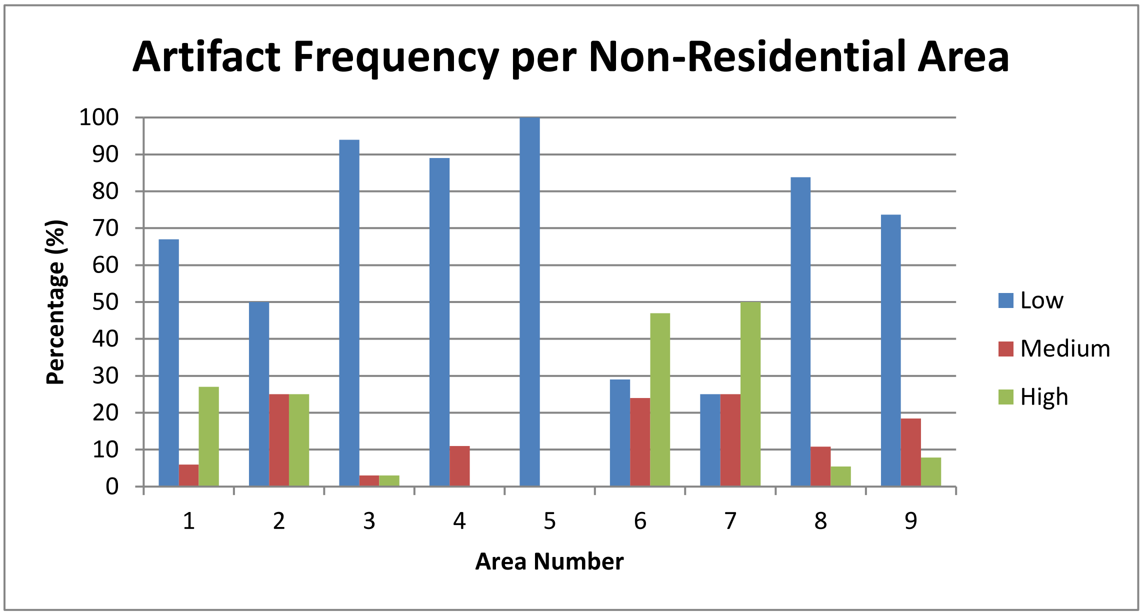
Table 14: Figura Site Ratio of Low to Medium to High Artifact Frequencies per Area

Area	Low	Medium	High	Total	Ratio	Percentage of low: medium: high
1	36	3	14	53	2.57: 0.2: 1	67: 6: 27
2	4	2	2	8	2: 1: 1	50: 25: 25
3	15	1	1	17	15: 1: 1	94: 3: 3
4	8	1	0	9	8: 1: 0	89: 11: 0
5	7	0	0	7	7: 0: 0	100: 0: 0
6	5	4	8	17	0.63: 0.5: 1	29: 24: 47
7	2	2	4	8	0.5: 0.5: 1	25: 25: 50
8	31	4	2	37	15.5: 2: 1	84: 11: 05
9	28	7	3	38	9.3: 2.3: 1	74: 18: 08
H1	5	0	2	7*	2.5: 0: 1	71: 00: 29
H2	11	5	4	20	2.75: 1.25: 1	55: 25: 20
H3	9	0	1	10	9: 0: 1	90: 00: 10
H4	24	1	0	25	24: 1: 0	95: 04: 00
H6	9	4	1	14	9: 4: 1	64: 29: 07

*Excludes Feature 302, a burial

Figure 19: Figura Site Feature Artifact Frequency Ranges

Figure 20: Figura Site Feature Artifact Frequency per Non-Residential Area Graph



Area 3 was interesting, as 13 of the 17 features found in this area had artifact counts of zero. Also in Area 3 is a relatively large feature identified by the field archaeologists as a midden, though only 87 artifacts were recovered from that feature. Presumably features found in an area with a midden would have low artifact counts, but the low artifact count of the midden was somewhat of a surprise, suggesting that label may simply have been applied to a large cultural paleosol, or that the contents of the midden were dispersed during previous agricultural cultivation. Areas 4 and 5, both located outside of the palisade, consist entirely of features with less than 100 artifacts. In fact, Area 4 consists of seven features with no artifacts and the single medium frequency feature in the area has an artifact count of 72. The highest artifact count from features in Area 5 is 24.

Across the seven non-residential feature clusters, the ratio average between low, medium and high artifact frequency features is 65%:11%:24%, while that ratio average for non-Areas 8 and 9 is 78%:15%:7%.

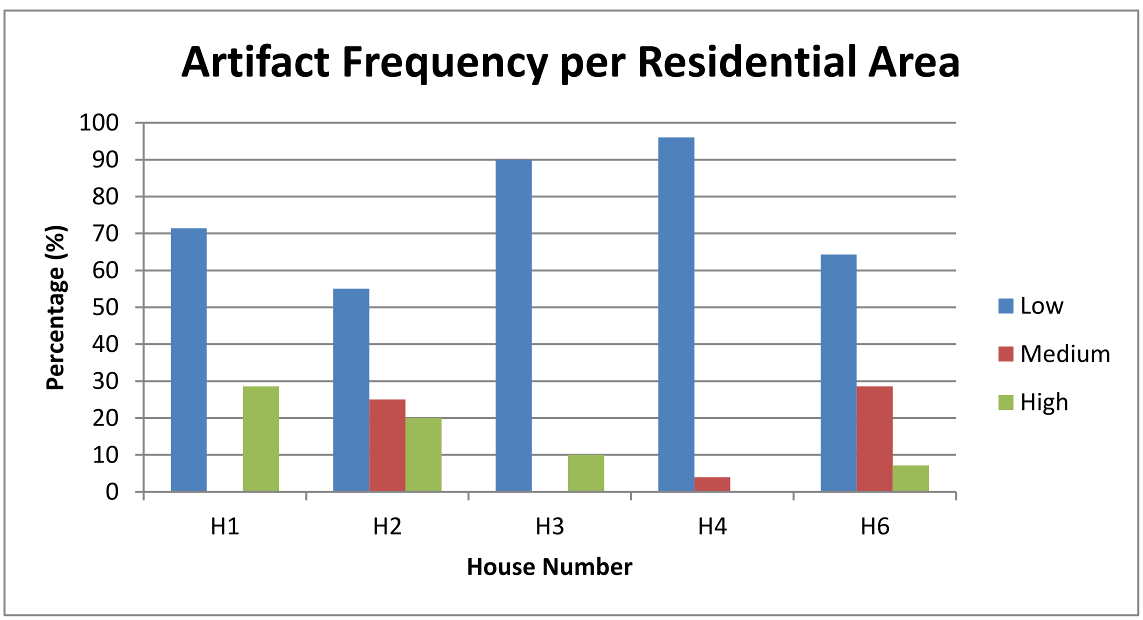
4.4.1 Residential Areas

All residential areas at the site are made up primarily of low artifact frequency features (see Table 14). In fact, 44 of 76 features, or 58% of features associated with houses, had artifact counts of zero. Figure 21 illustrates this in graphical form.

House 1, 2, and 3 all had at least one feature with a high artifact count within the interior of the house, while Houses 4 and 6 had at least one medium frequency feature close by but exterior to the house. As well, the area of House 6 just manages to encompass one high frequency feature, while there are a number of high frequency features immediately south of the House 4 area. It should be noted that House 6 is immediately adjacent to the largest midden reported for the site (Feature 32), which had 1,391 artifacts present.

In total across all houses, residential areas have 76% low frequency features, and a similar range of medium (13%) and large (11%) frequency features, and no individual house had more than 35% non-low artifact frequency features present.

Figure 21: Figura Site Feature Artifact Frequency per Residential Area Graph



4.4.2 Artifact Frequency Summary

Features with high artifact frequencies tend to cluster together in certain areas, especially in non-residential Area 1 and Area 6. Five of the six features with over 1200 artifacts were located inside the palisade; three in Area 1 (plaza area), one in House 1 and one in non-Area 8, close to House 1 between Areas 1 and 3. Almost all non-residential areas had at least one high artifact frequency feature, with the exception of Area 4 and 5. While all residential areas were dominated by features with low artifact frequencies, the only house to not have a feature with a high artifact frequency was House 4 (though two high artifact frequency features are located to the immediate southwest of the house in Area 1). Of the 25 features associated with House 4, 18 of them are devoid of artifacts, and the highest artifact count from the house is 68 artifacts.

General artifact frequency patterns align well with the other feature attributes considered so far. The predominance of low yield features is consistent with predominance of smaller features by depth and volume, and lacking stratigraphy, across the site**.** At a general level, stratified features tend to have higher artifact frequencies (with a few exceptions noted for smaller stratified features), but a lack of stratification does not mean a lack of higher artifact frequencies.

Clustering of features with higher yields were found in Areas 2 and 6, which suggests that some number of deeper, presumably cache or storage pits may also have served as refuse receptacles at some point in their use lives. As well, the higher number of artifact rich features in Areas 1 and 7 also suggest that either similar, specific activities were occurring in each of those areas to generate particular deposits, or that they served as general disposal areas in addition to whatever other activities took place in those areas. As well, all house areas, though generally lacking large numbers of high artifact frequency features, did have either immediate or proximate access to at least one such feature, as well as exhibit one feature within house walls where at least a medium quantity of material was deposited. Given my observation earlier that at least one pit outside but near each house may have served as a refuse pit, artifact frequency patterns again suggests that a few of the features which are considered part of non-residential Area 1 may in fact have been tied to House 3 and 4 residential purposes.

An intriguing pattern worth noting is the relatively high concentration of medium and high artifact frequency features located exterior to the palisade in Areas 6 and 7, and in House 6. Considering the very high artifact yield of a midden also in this area (Feature 32), and second midden feature (Feature 161), this may suggest that at least some activities in this area outside of the palisade were distinct from most activities occurring inside of palisade spaces, or perhaps represent a temporally distinct period of deposition. Further consideration of these possible variations are explored later on in this chapter.

While the overall artifact frequency patterns across the Figura site provided general affirmation of basic observations of spatial characteristics of features, I also wanted to explore finer grained patterns of particular artifact types from the site. These are discussed in the next section of this chapter.

4.5 Other Artifact Analysis

As artifact frequency encompasses such a large, broad category of objects, a few categories were teased out from this more general artifact analysis of the site. Tools, number of vessels and refuse were analyzed to determine if these attributes were found to reflect spatial patterning within specific areas across the site, or if their deposition pattern can help determine residential from non-residential areas.

4.5.1 Tools

Tools, as defined in Chapter 3, consist of any object used as a tool, such as projectile point, bone awl, etc., though the vast majority (98%) of which were either flaked or ground stone objects. In total, 228 tools were recovered from the site from different contexts. Table 15 breaks down where tools were located at the site.

Tool frequency categories were established at 0, 1-2 tools, 3-5 tools, 6-8 tools and 9-11 tools. These five categories were further divided into three broader categories: low, medium and high (see Table 16). Table 17 illustrates the percent of tool frequency per area at the site and Figure 22 illustrates the categories visually.

Table 15: Figura Site Tool Contexts

Context	Number of Tools	Percentage
Units	33	14
Support Posts	1	<1
Middens	17	7
Features	175[4]	77
Hearth	2	1
TOTAL	228	100

Table 16: Figura Site Feature Tool Frequency Ranges

Tool Frequency Range	Category	Number of Features	Percentage
0	No	214	79
1-2	Low	31	11
3-5	Medium	16	6
6-8	High	5	2
9-11		4	1

In all, 214 of 270 features had no tools present in them, 31 features had one to two tools in them, 16 features had three to five tools, and 9 features had six or more tools. Areas 1 and 6 are notable for their number of features with high tool frequencies (see Table 17), and total number of tools compared to the rest of the site (Area 1 – 28% of 173 tools found in features; Area 6 – 33% of 173 tools). In Area 1, features with tools in medium or high frequencies are concentrated adjacent to Houses 3 and 4, and along the palisade. These tools are primarily flaked stone items, with an abundance of bifaces and utilized flakes. Area 6 is the only location across the site that has any features with very high (nine or more) tools in features; four in all. This encompasses a wide range of flaked stone tool types from the site’s assemblage, including 100% of antler flakers, 67% of bone awls, 60% of drills, 50% of gravers, 33% of wedges, 29% of projectile points and scrapers, 24% of bifaces, 20% of hammer/anvil stones, 18% of utilized flakes, 17% of perforators and 8% of retouched flakes from the entire site. Only one tool

[4] 2 tools were found in F. 127 which was not included in the features analyzed as the feature had a very irregular profile, meaning only 173 tools were included in the analysis of tools from features

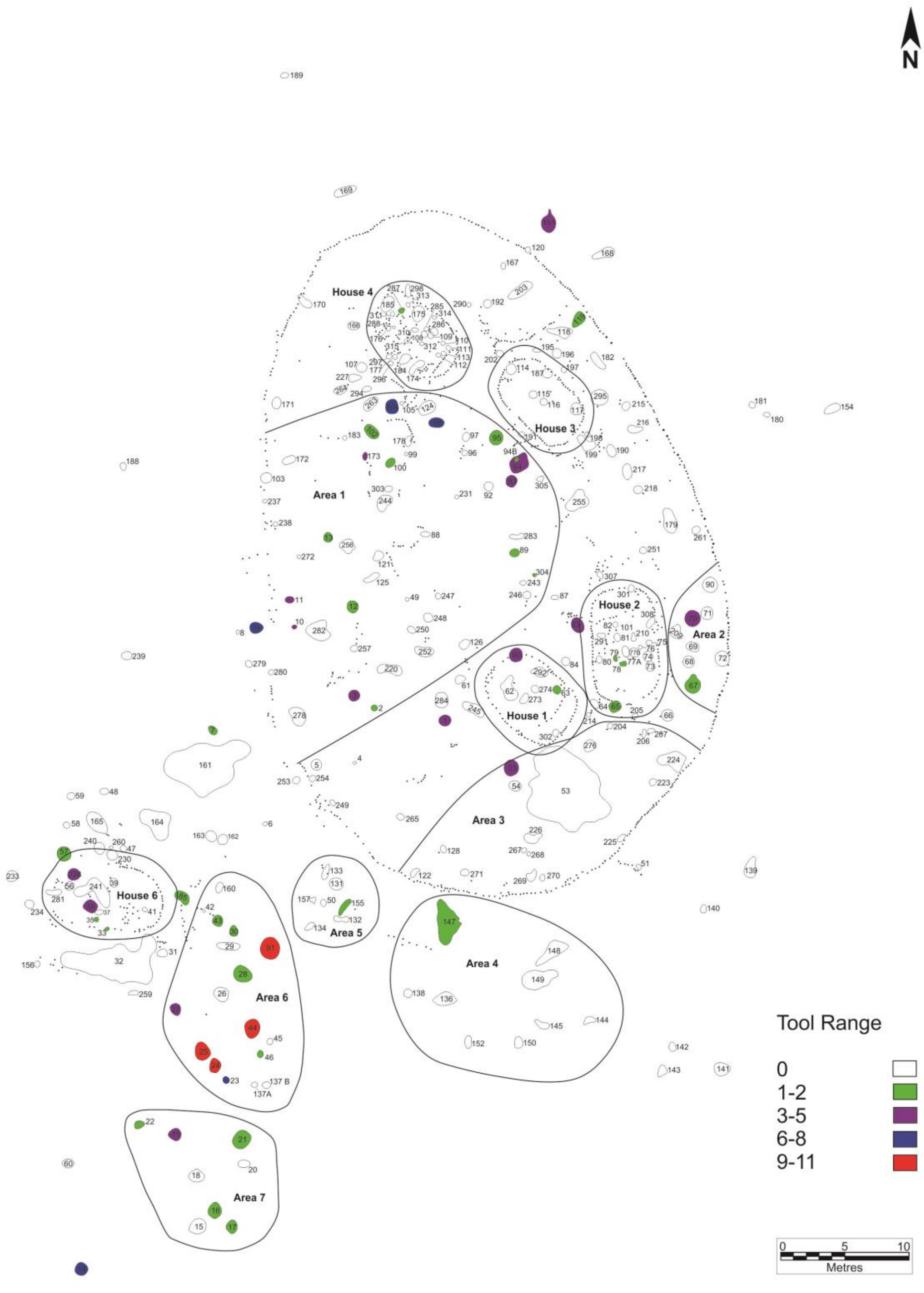
category found elsewhere across the site, a celt, is not present in one of the Area 6 high frequency features.

Table 17: Figura Site Feature Percent of Tool Frequencies per Area

Area	Zero	Low	Medium	High	Total	# of Tools in each Area	Percentage of no and tools present	Percentage of low: medium: high
1	36	9	6	2	17	49	68: 32	53: 35: 12
2	6	1	1	0	2	5	75: 25	50: 50: 0
3	16	0	1	0	1	5	94: 6	0: 100: 0
4	8	1	0	0	1	1	89: 11	100: 0: 0
5	6	1	0	0	1	1	86: 14	100: 0: 0
6	7	4	1	5	10	57	58: 42	40: 10: 50
7	3	4	1	0	5	10	38: 62	80: 20: 0
8	35	1	1	0	2	6	95: 5	50: 50: 0
9	34	1	1	2	4	17	89: 11	25: 25: 50
H1	5	1	1	0	2	5	71: 29	50: 50: 0
H2	16	3	1	0	4	6	80: 20	75: 25: 0
H3	10	0	0	0	0	0	100: 0	0: 0: 0
H4	24	1	0	0	1	1	96: 4	100: 0: 0
H6	8	4	2	0	6	10	57: 43	67: 33: 0

Residential areas tended to consist of features with low tool frequencies, and no house contained a feature with high frequencies of tools.

Figure 22: Figura Site Feature Tool Ranges



When analyzing features by tool frequency it becomes apparent that tools were slightly more commonly found exterior to the palisade, with 96 of 173 tools (55%) coming from features located outside the palisade, and despite the fact that slightly more than half (53%) of all features with any tool in them come from inside the palisade (Table 17). The high number of tools concentrating in Area 1 and 6 suggest that specific activities requiring the use of tools such as utilized flakes, scrapers, bifaces, projectile points, awls and drills were occurring in those areas, or that general waste disposal was occurring there in proximity to such activity areas. Given the descriptions of these tools from the consultant archaeologist's Stage 4 mitigation report, these tools were being disposed of as refuse, since the majority of the tools found in features with the highest tool frequencies were broken or incomplete (see Golder 2012 for more details). The distinctive high frequency of tools found in Area 6, notable for a higher frequency of deep, large and artifact rich features, is distinct from the pattern for Areas 2 or 7, and thus adds to the patterns observed that suggest Area 6 feature use may have varied from those two other concentrations of deeper, larger features.

The lack of tools found in or close by houses suggests that most activities requiring the use of these kinds of tool types occurred outside of houses.

4.5.2 Vessels

In my earlier research for this thesis, vessels stood out to me as an artifact category that could offer patterned insights, as certain features had very high vessel counts compared to others. Vessels refer to whole or partial ceramic pots represented by a single rim sherd, or by multiple rim and other decorated sherds, as was defined in the consultant report (Golder 2012).

Low vessel counts per feature were defined as a feature having one to three vessels, medium vessel counts have four to five vessels per feature and high vessel counts were defined as having six or more vessels per feature (see Table 18). Vessels were quite sparse across the site, and were reported from only 52 features. Only three Areas and one House had two or more features with high frequencies of vessels (see

Table 19 for the percentages). When looking at percentages, the small sample size of features with vessels precludes any broad insights, and only a few specific patterns can be noted.

Table 18: Figura Site Feature Vessels Frequencies

Vessel Range	Category	Number of Features	Percentage
0	No	218	81
1-3	Low	33	12
4-5	Medium	4	1
6-9	High	9	3
10+		6	3

Table 19: Figura Site Feature Ratio of Low to High Vessel Counts per Area

Area	Zero	Low	Medium	High	Total	No vs some Vessels	Percentage of low: medium: high
1	40	5	1	7	13	75: 25	38: 08: 54
2	4	4	0	0	4	50: 50	100: 00: 00
3	15	2	0	0	2	88: 12	100: 00: 00
4	9	0	0	0	0	100: 0	na
5	7	0	0	0	0	100: 0	na
6	7	7	1	2	10	41: 59	70: 10: 20
7	5	2	0	1	3	62: 38	67: 00: 33
8	34	1	0	2	3	92: 8	33: 0: 67
9	31	5	1	1	7	82: 18	71: 14: 14
H1	5	0	1	1	2	71: 29	0: 50: 50
H2	18	2	0	0	2	90: 10	100: 00: 00
H3	9	0	0	1	1	90: 10	00: 00: 100
H4	23	2	0	0	2	92: 8	100: 00: 00
H6	11	3	0	0	3	78: 22	100: 00: 00

With one exception, there are a greater or equal number of no vessel to vessel features in all areas of the site. Area 6 reverses that trend. As has been demonstrated previously, Area 6, with its concentration of large, deep features (high number of tools and high quantity of refuse, see below) is a real focal area of the site for generating material remains.

Area 2 exhibits a slightly different pattern, in that it contains an equal number of features with vessels to features without vessels. The predominance of ceramic debris in features in this area (see below) suggest that disposal of ceramic debris is the predominant activity for this area.

Both residential (87%) and non-residential areas (72%) are dominated by features lacking vessels, a pattern also noted for the non-areas (86%). The slightly greater presence of vessels outside of residential areas is consistent with general artifact patterns noted earlier, and likely reflects a tendency for materials to be deposited in features outside of houses. Considering exterior to house areas inside the palisade and outside the palisade, there is a greater frequency of features without vessels inside the palisade (82%), than outside the palisade (75%).

High vessel frequency patterns align well with other feature attributes considered thus far. High vessel counts are found in features with the deepest or medium depth categories, in the medium and large volume categories, the highest artifact frequencies, and the highest refuse frequencies (see below). Vessel count did not correspond with tool frequencies, as the features with the 15 highest vessel counts had a range of tool frequencies present (3 no tools, 4 low, 5 medium and 3 high), possibly suggesting that tools and vessels were not disposed of in the same places or tied to the same disposal generating activities.

The presence of high vessel counts found in or close by houses suggests that activities that required the use of vessels occurred around house areas, or that vessels were discarded in and around where they were used. The small cluster of features with high vessel counts south of House 4 could be associated with that house, meaning that activities requiring vessels were performed a few meters outside of houses.

4.5.3 Refuse

Refuse was analyzed to determine if it could help tease out residential vs. non-residential areas at the site. Here refuse is comprised of chipping detritus, faunal remains and all ceramic sherds (rim, shoulder, neck, body, fragmentary and basal sherds). I chose to characterize refuse in this way to explore whether there were any pattern differences to specific kinds of refuse types (i.e., lithics, ceramics, faunal remains) showing up across the site. Refuse frequency categories were established at 0, 1 to 49, 50 to 99 and more than 100 objects. Low refuse frequencies are defined as features with 1 to 49 pieces of refuse, medium as 50 to 99 pieces of refuse and high as 100 or more pieces of refuse (see Table 20). Refuse frequency was divided into these categories as a relatively arbitrary set of distinctions along a continuum of unintentional to intentional use of the features for material artifact disposal. The percentages of none to some and low to medium to high refuse frequencies for non-residential and residential areas are provided in Table 21. Figure 23 illustrates the categories visually.

Table 20: Figura Site Feature Refuse Ranges

Refuse Frequency Range	Category	Number of Features	Percentage
0	No	132	49
1-49	Low	73	27
50-99	Medium	14	5
100+	High	51	19

Table 21: Figura Site Feature Refuse Frequency Percentages per Area

Area	Zero	Low	Medium	High	Total	Percentage none: some	Percentage low: med: high
1	22	15	1	15	31	42: 58	48: 03: 48
2	3	1	0	4	5	38: 62	20: 00: 80
3	12	3	1	1	5	70: 30	60: 20: 20
4	7	1	1	0	2	78: 22	50: 50: 00
5	3	4	0	0	4	43: 57	100: 00: 00
6	2	4	2	9	15	12: 88	27: 13: 60
7	1	1	1	5	7	12: 88	14: 14: 71
8	22	12	1	2	15	59: 41	80: 07: 13
9	16	15	2	5	22	42: 58	68: 09: 23
H1	3	2	0	2	4	43: 57	50: 00: 50
H2	9	4	2	5	11	45: 55	36: 18: 45
H3	8	1	0	1	2	80: 20	50: 00: 50
H4	19	5	1	0	6	76: 24	83: 17: 00
H6	5	5	2	2	9	36: 64	56: 22: 22

Figure 23: Figura Site Feature Refuse Ranges

Refuse frequencies varied across non-residential areas (see Figure 24), with Areas 2, 6 and 7 – Areas noted for high artifact quantities and deep, large pits - dominated by high refuse frequency features (80%, 60% and 71% respectively). These areas all also had the fewest numbers of features with no refuse remains (see Table 21).

There were variations noted between non-residential areas over the kinds of refuse present (i.e., chipping detritus, faunal remains or ceramic sherds) in high yielding (100 fragments or more) refuse features (see Table 22). For example, in Area 1, while high yielding refuse features were found across the area, features with predominantly faunal remains were consistently found close to Houses 3 and 4, again suggesting that the association of these features may well be with those House areas and perhaps food preparation. In Area 2 all four features with high refuse frequencies were mostly to almost exclusively made up of ceramic refuse, mainly fragmentary sherds. This could indicate a specialized ceramic discard area. Also worth noting is that in Area 6, which has 9 high yielding refuse features, only three were dominated by one refuse category. Two of these features, Features 27 and 44, were significantly made up of faunal remains, while 26 had a slight predominance of ceramic refuse.

Figure 24: Figura Site Feature Refuse per Non-Residential Area Graph

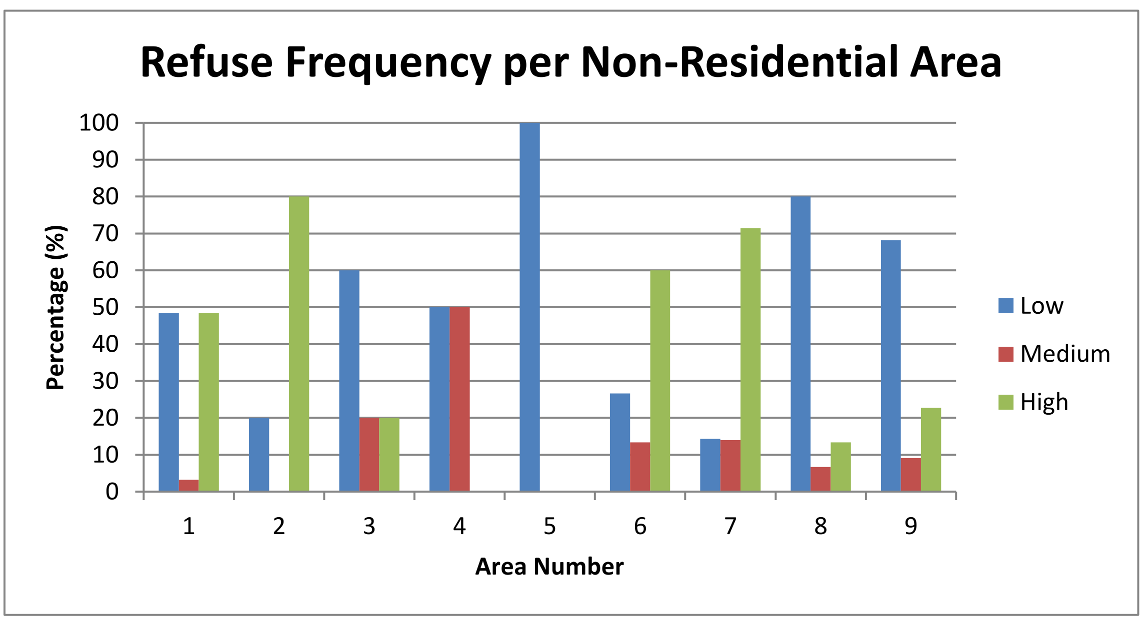


Table 22: Figura Site High Yielding Feature Refuse Percentages

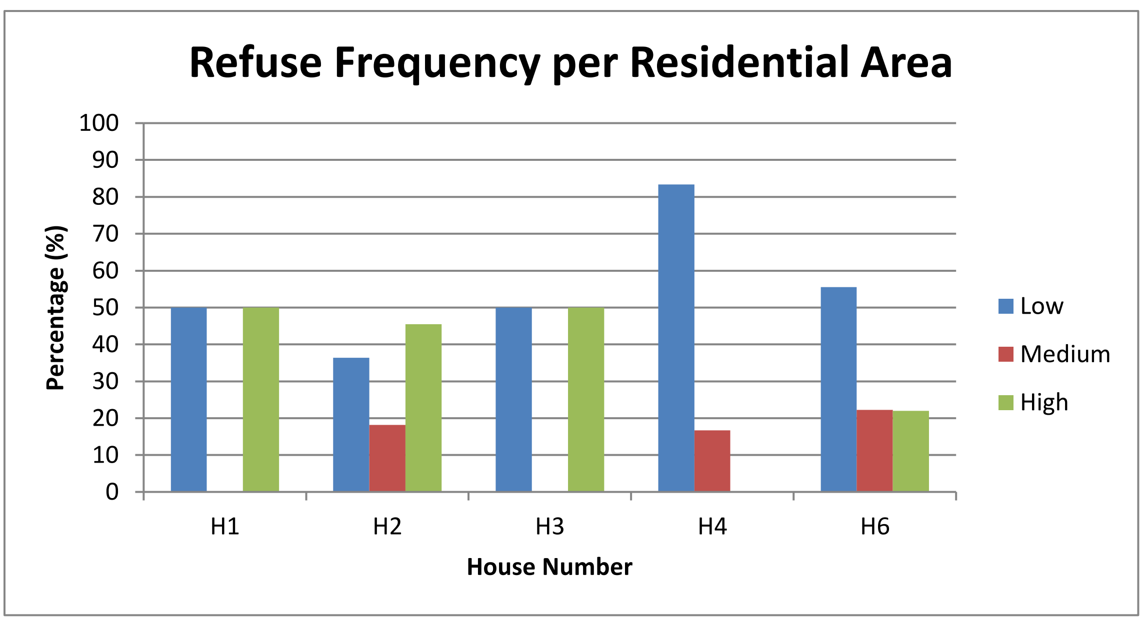
	Lithic		Faunal Remains		Ceramic	
Area 1	11 (51%) 104 (70%)	173(80%)	94 (58%) 94B (92%)	98 (72%) 102 (50%)	3 (77%) 12 (56%) 13 (69%) 92 (93%)	93 (82%) 95 (63%) 100 (55%)
Area 2	-		-		67 (60%) 69 (90%)	70 (85%) 72 (99%)
Area 3	55 (50%)		-		-	
Area 4	-		-		-	
Area 5	-		-		-	
Area 6	-		27 (66%)	44 (74%)	26 (55%)	
Area 7	19 (55%)		17 (77%)		21 (70%)	22 (52%)
Area 8	-		-		1 (64%)	5 (83%)
Area 9	151 (84%)		60 (55%)		9 (76%) 14 (66%)	165 (69%)
House 1	-		-		63 (78%) 86 (82%)	
House 2	-		65 (85%) 78 (94%)	79 (84%)	-	
House 3	-		-		114 (71%)	
House 4	-		-		-	
House 6	85 (50%)		-		-	
Total	**7**		**11**		**22**	

Additional observations can be offered based on the variability of types of refuse observed across the site. Features with the highest frequencies of chipping detritus (n=7) are found predominantly (n=6) away from residential areas of the site. The one exception, Feature 85 of House 6, has exactly 50% chipping detritus refuse present, so is not overly predominant. Having chipping detritus located outside of residential areas makes sense as it is very sharp and poses a health risk to the site inhabitants (Schiffer 1987).

Features where faunal remains were the highest refuse type (n=11) were found both in residential and non-residential areas. It is worth noting that only House 2 had a predominance of high yielding refuse features (n=3) dominated significantly by faunal remains (see Table 22). As mentioned previously, presumably the high number of faunal remains in features points to butchering and cooking activities taking place in proximity to those features. If this is the case, there is the possibility that the distinctive pattern of faunal remains in House 2 may mean that food preparation occurred inside that house, like areas with high faunal remains found external to houses. One reason for this pattern inside House 2 could be due to the preparation of food during inclement weather or colder times of the year, precluding use of exterior activity areas at that time.

In terms of general refuse patterns within residential areas, all houses tended to have more low and medium yielding refuse pits than high yielding refuse pits. All houses except for House 4 had one or more features with a high refuse frequency. Across the residential feature clusters, the average between low, medium and high refuse frequencies is 66%:26%:8%, which is different to that seen for the non-residential areas (42%:9%;49%), underscoring the fact that most high yielding refuse features are located outside of house areas. In fact, only four, relatively small features with high yielding refuse are found inside house walls (1 in House 1, 2 in House 2, and 1 in House 3). Finally, it should also be noted that all houses had features that did not have any refuse present in them. This was the majority pattern for all features from Houses 3 and 4, more evenly split for Houses 1 and 2, and the minority pattern for House 6 (Figure 25).

Figure 25: Figura Site Feature Refuse per Residential Area Graph



It is worth noting that overall 139 or 51% of the 271 features analyzed for this thesis contained no refuse-associated artifacts (see Tables 20 and 21). Table 21 details the percent of empty features to features with refuse by area. Generally, there is a wide variation in the representation of features empty of refuse by area, and no meaningful patterning, other than to note the disparity can be marginal, or quite stark, depending on area. Notably, however, the overall percentages between no refuse and refuse features is exactly opposite between residential areas and non-residential areas (58% no refuse, 42% refuse in residential areas; 42% no refuse, 58% refuse in non-residential areas), which likely underscores the greater variety of reasons to create more transitory cultural features for other than object disposal (e.g., soil indentations; divots for holding pots, etc.) inside houses. Non-Areas 8 and 9 averaged close to a 50/50 percent split, underscoring their value as a control here to variable patterns within definable feature areas.

Given that residential areas are distinctive, I then compared only non-residential areas inside the palisade, to non-residential areas outside of the palisade, including the non-Areas for each. Inside the palisade there were 51% no refuse features, to 49% refuse features, consistent with the overall non-Area pattern for the site. Outside the palisade there were 37% no refuse features. The higher quantity of features with some refuse outside of the palisade suggests to me that various activities occurring outside the palisade in non-residential areas were more focused on refuse-generating activities, or that perhaps there was some spatial planning in refuse disposal that had a tendency to lead inhabitants to dispose of refuse beyond the palisade.

There are three middens present at the site, one directly south of House 1 (Feature 53), one directly south of House 6 (Feature 32), and one northeast of House 6 (Feature 161). I expected that low artifact counts, including features with zero artifact counts, would be common in areas adjacent to middens, as they seemingly would have served to attract waste disposal from the immediate vicinity. Certainly Area 3, which surrounds the midden south of House 1, did have many empty features or features with low artifact frequencies and only had one feature, Feature 55, with a high artifact frequency. In contrast, Area 6, which is located directly east of Feature 32, has only two features with zero artifacts and many features with high artifact frequencies. Likewise, House 6, immediately to the north of the midden, has two high yielding refuse features. This may suggest the midden and Area 6, and perhaps House 6, were not active at the same time, or that there was a functional or cultural prohibition of some sort that excluded Area

6 and House 6 refuse from entering that midden, although direct and indirect ceramic cross mends between that midden and features in Area 6 indicate the latter suggestion is false (see discussion below).

4.5.3.1 Refuse Summary

Generally, Areas with quantities of higher refuse yielding features (Areas 1, 2, 6, 7) tend to be areas also known for quantities of large, deep features. In these areas there tends to be both more refuse, and concentrations of tools, underscoring that these areas of the site served particular activities that were material intensive. Moreover, it also suggests that these activities tend to occur outside residential areas. This suggestion is not to imply such activities did not occur elsewhere inside or outside the palisade, or inside houses, just that the intensity and perhaps more single purpose of such activities are heightened in these areas.

Refuse frequency patterns align well with the other feature attributes considered so far. The predominance of no or low refuse frequency features across the site is consistent with smaller features by depth, volume or stratigraphy. Clustering of features with higher refuse yields in Areas 1, 2, 6 and 7 may suggest that some number of deeper, presumably cache or storage pits may also have served as refuse disposal pits at some point in their use life.

It is also interesting to see that all houses, except for House 4 (which does have two high refuse features 2 meters beyond the limit of the residential area), have at least one feature with a high refuse frequency directly associated with them. These features are frequently located just outside the house wall, or appear to be part of the house wall. These features could have been used as door dumps, where artifacts from the house was deposited during cleaning activities (Tani 1995:237).

4.5.4 Cross Mend Analysis

A ceramic cross mend analysis was undertaken as part of the spatial consideration of features across Figura. As ceramic vessels are all tied to a feature context, a cross mend analysis allowed me to consider both intra and inter area relationships across the site. As described in Chapter 3, vessels were cross mended based on physical and inferred mends, with inferred mends being accepted if they met minimally a three-attribute threshold for confirmation. The cross mend analysis was performed on all identified rims from the site based on the Golder (2012) report, which identified 241 vessels, with vessels ranging from a single decorated rim sherd, to multiple rim sherds, to larger vessel sections. The consultant's designations of vessels were solely based on rim sherd/vessel sections identified from within a single feature; no consideration of was given to vessel mends between features. My cross mend analysis did consider mends between features, and in the process identified 35 cross mends not previously identified. This analysis thus reduced the vessel count from the site to 206. The result of that cross-mend analysis is displayed in Table 23 and Figure 26. Table 24illustrates the number of mends present interior and exterior the palisade.

Of the 35 cross mends identified 12 were direct physical mends. Physical mends occurred between vessels in features adjacent to each other, such as Feature 24 and Feature 25, and between features located inside and outside of the palisade, such as between Feature 24 and Feature 12. In six instances mended sherds connecting to the same vessel were found in more than two features, with three being the largest. Of these six, two were physical mends and four were inferred mends. In three instances mends were found between vessels in the same feature (Vessel 92 in Feature 94, Vessel 51 in Feature 89 and Vessel 137 in Feature 5), therefore these vessels could not be mapped.

Of the three middens located at the site, only one had cross mends. Feature 32, which is located outside of the palisade and adjacent to House 6 had three cross mends with features in close proximity to the midden.

For my study, cross mend data was considered across the residential, non-residential and unassigned areas defined for the Figura site (see Table 24). A vessel cross mend was counted once per area (i.e., if a vessel cross mended with multiple features in the area, it was only counted once). Of the assigned areas, Area 1 and Area 6 contain the highest number of features containing cross mends and vessels mended.

Figure 26: Figura Site Ceramic Cross Mend Results

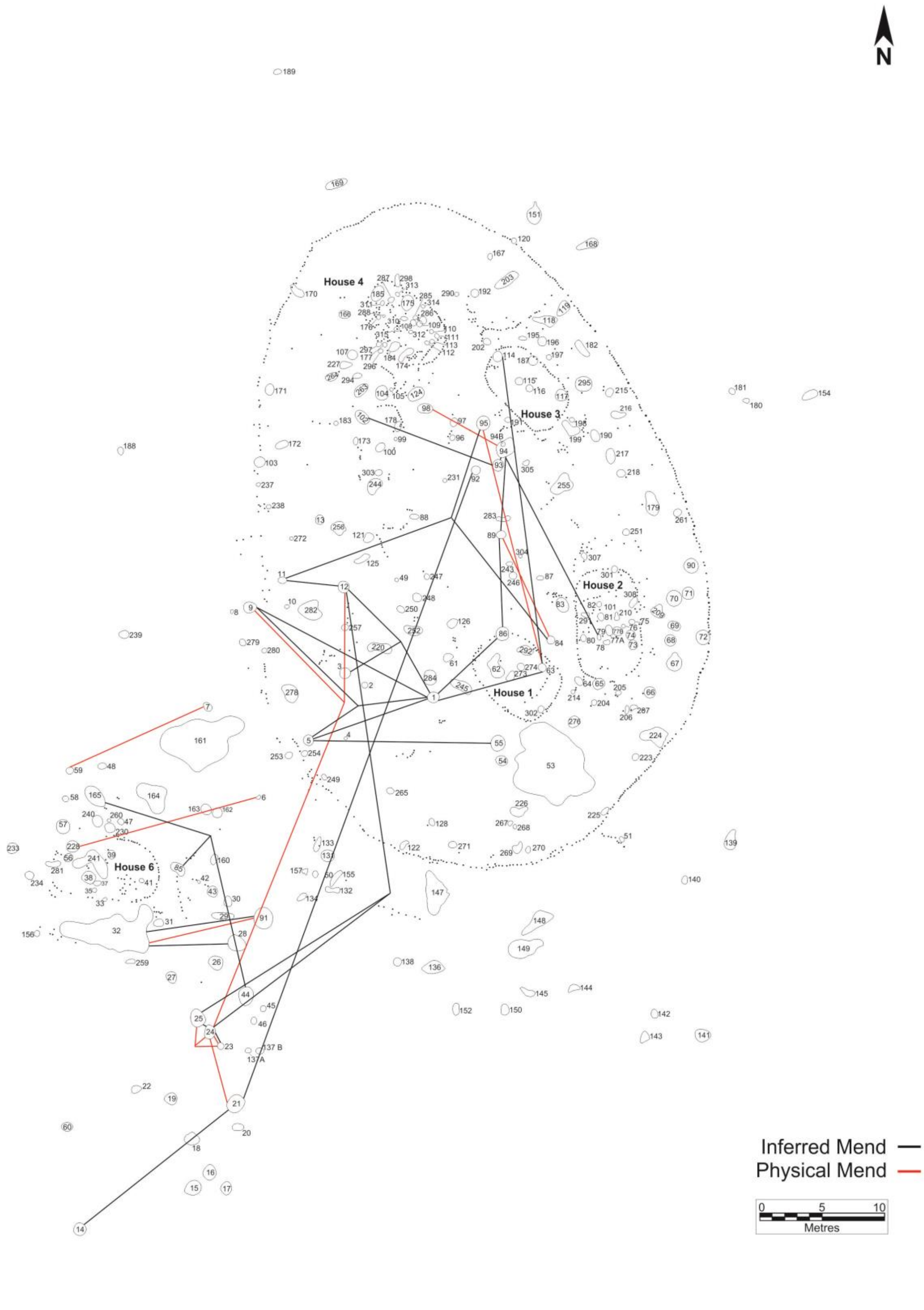


Table 23: Figura Site Cross Mend Results

Vessel #	Associated Features	Inferred or Physical
3	9, 12, 24	Physical
28	32, 91	Physical
49	89, 84	Physical
51	89	Physical
73	6, 228	Physical
83	7, 59	Physical
85	23, 24, 25	Physical
92	94	Physical
106	94, 98	Physical
131	21, 24	Physical
208	63, 95	Physical
228	23, 24	Physical
1	12, 24, 25	Inferred
4	1, 3, 12	Inferred
5	11, 12	Inferred
13	1, 5, 9	Inferred
14	1, 9	Inferred
18	1, 86	Inferred
19	1, 63	Inferred
21	44, 85, 165	Inferred
26	28, 32	Inferred
29	32, 91	Inferred
34	11, 84, 95	Inferred
41	93, 94	Inferred
45	93, 102	Inferred
49	89, 94	Inferred
50	86, 89	Inferred
80	23, 24	Inferred
86	24, 25	Inferred
89	5, 55	Inferred
108	79, 94	Inferred
114	14, 21	Inferred
127	21, 92	Inferred
137	5	Inferred
198	63, 114	Inferred

Table 24: **Figura Site Ceramic Vessel Cross Mend Data**

Area	# of Features with Cross Mends	# of Vessels Cross Mended	Cross mends connecting to Areas Inside the Palisade	Cross mends connecting to Areas Outside the Palisade
House 1	2	5	5	0
House 2	1	1	1	0
House 3	1	1	1	0
House 4	0	0	0	0
Area 1	9	11	8	3
Area 2	0	0	0	0
Area 3	1	1	1	0
Area 8	3	9	9	2
Interior to Palisade Total	**17**	**28**	**25**	**5**
House 6	2	2	0	2
Area 4	0	0	0	0
Area 5	0	0	0	0
Area 6	6	9	2	8
Area 7	1	2	1	2
Area 9	7	9	3	8
Exterior to Palisade Total	**16**	**22**	**5**	**20**

The unassigned areas encompass features with multiple mends, including Features 1, 5 and 84 of non-Area 8, and Features 9 and 32 of non-Area 9. Also evident from Table 24 is the fact that interior areas tend to cross mend mostly with other interior areas, and exterior areas tend to cross mend with mostly other exterior areas. The only exceptions are Features 24 and 25 in Area 6, Feature 21 in Area 7 and Feature 9 in non-Area 9, all cross mending with Feature 12 in interior Area 1. Feature 9 also cross mended with interior non-Area 8 Features 5 and 1, and Feature 21 cross mended with interior Area 1.

In general, features noted as being deeper, having more volume, and containing more artifacts tended to be the kind of feature with cross mends. But what is perhaps more interesting are the patterns, and absence of patterns, across areas of the site. For example, the absence of extensive cross mend examples between interior and exterior areas suggest that these parts of the site were mostly separate, either by activity or by period of use over the history of the site. The fact that Features 24 and 25 in Area 6 connect with only a single feature in Area 1 also suggest that interior-exterior mixing of materials was specific and circumscribed. What I mean by this is that Feature 24 contains the ceramic remains of an unique glyph vessel, as well as other artifact classes that could suggest the remains of a possible episodic, culturally specific ritual or medicinal activity are present in the feature. That distinctiveness to the assemblage in Feature 24 and cross mend connections with other pits notable for high cross mend numbers may suggest intentional interaction with those spaces as a result of the possible ritualistic implications of Feature 24's assemblage, rather than the casual result of daily life and vessel disposal. It could be that stages of this ritual activity took place in distinct areas of the site, or that the people involved in the ritual activities in Feature 24 were also involved in activities tied to Features 12 and 9 in Areas 1 and 9. Likewise, the fact that Feature 9, located immediately adjacent to the palisade at a gap in the post row that could be interpreted as an entrance to the interior space of the settlement, may imply that Feature 9 served a particular function that tied interior and exterior spaces of the Figura site together.

Other observations of the cross mend data are notable as a result of an absence of cross mends. For example, there is a lack of cross mends that connect the northerly-most end of the site, including House 4, to other areas of the site. This absence of cross mends may imply either daily residential and non-residential activities were less intense at this end of the community, more exclusive, or were of a shorter duration over the life of the site. As well, notable is the complete absence of cross mends from Area 2, despite high frequencies of ceramics from this area, which may underscore that the isolated nature of this area restricted opportunities for mixing of materials.

Finally, I had previously suggested that large features at the edge of Area 1, notably Features 93, 94, and 95, might be better thought of as associated with House 3, immediately adjacent to those features. However, cross mend data link these features with other areas across Area 1 and with House 1 and 2, while one cross mend connects House 1 with House 3. This suggests that use of these features was not exclusive to House 3 residents, and served needs that connected interior spaces and multiple houses together in the daily living and ordering of activities at Figura.

4.6 Using Feature Attributes to Identify Potential Houses

During the excavations of the Figura site, and despite the clear settlement patterns for five houses at the site, the consultant archaeology team debated about the possibility of additional houses present within the site's settlement pattern (e.g., Golder 2012). For example, originally the consultants had identified an additional house (House 5), located immediately north of House 3 and built onto the side of the palisade. Eventually this designation was dismissed due to the limited post patterning and absence of feature concentrations. Additionally, during excavations crews repeatedly re-shovel shined the area immediately to the east of House 6 (Neal Ferris, personal communication 2013). These crew members were convinced for a while that a slightly northwest-southeast aligned house, similar in size to the others documented, was present (part of the north end wall and west side wall was suggested by a row of posts identified in the area).

These deliberations suggest to me the patterns documented over the course of my analysis of feature attributes distinguishing residential from non-residential areas of the site could help test possible additional house areas not otherwise evident in the field.

4.6.1 Potential House in Area 1

One potential locale I continually returned to as a potential house is found in the area south of House 4. There the suggestive alignment of two rows of posts could, in combination, represent a potential house corner and end of a house. There were also numerous support or larger posts identified (n=8) in this area, including five that would be inside the house if this is indeed what this space of the site contained. The possibility that this area may represent a house area not readily recognized in the field because portions of the house wall were not visible during excavation affords me the opportunity to see if the distinctions I have already noted in feature spatial patterning between residential and non-residential areas of the site might be useful to confirm this possibility. Using the ratio of features by depth, volume, stratigraphic layers and artifact frequency, I will evaluate whether this area of the site could be a house.

First, to get a sense of the dimensions of this potential house I need to consider the general dimensions for the known houses on the site (Table 25). The known houses are relatively similar in their length and widths, indicating a similar design was used at this site. Using these measurements it is possible to extrapolate a possible additional house area using the fragments of possible house wall and end for the area in question. While the two rows of potential house wall suggested this structure would be one of the longest, at a length of 9.6m on the site, no accurate width could be estimated, so I applied the average from the documented houses (4.62m to 5.77m) as the possible width. Using those estimates, Figure 27 illustrates the largest possible dimensions of the potential house.

Table 25: Figura Site House Measurements

House #	Length (m)	Width (m)	Area (m)
1	7.69	5.77	44.38
2	9.62	5.38	51.78
3	8.08	4.62	37.28
4	8.08	5.38	43.49
6	9.23	5.38	49.70
Mean	8.54	5.31	45.33

4.6.2 Spatial Analysis of Potential House

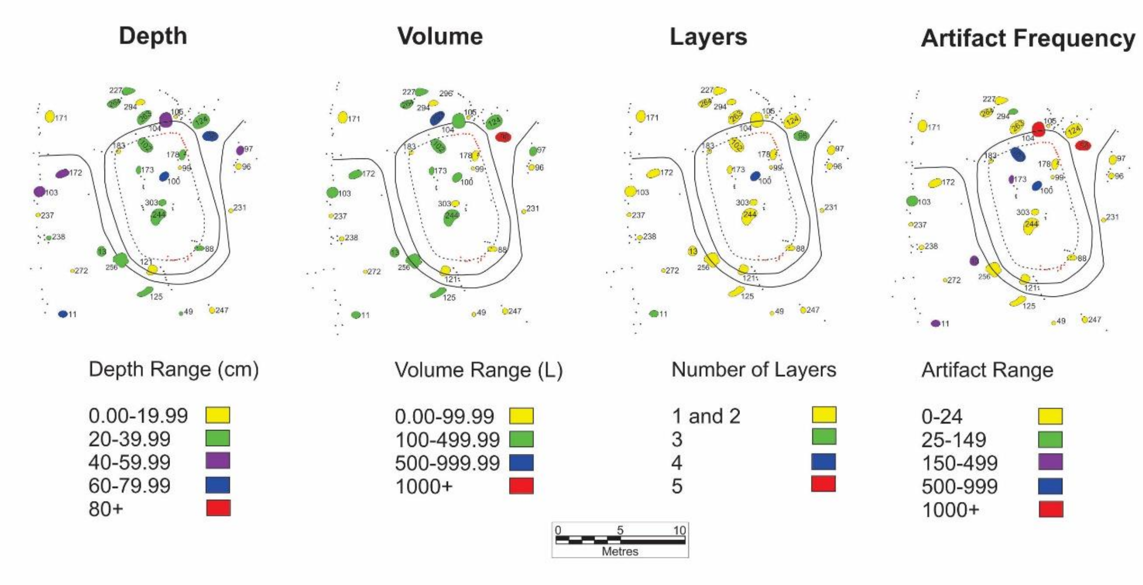
Figure 28 illustrates the depth, volume, stratigraphic layers and artifact frequency ratios visually for the potential house, and Table 26 lists the feature attributes by grouping for the potential house.

Table 26: Figura Site Feature Percentages of Feature Attributes for Potential House

Potential House	Shallow/Small/Low	Medium	Large/Deep/High	Percentage
Depth	3	6	2	27: 55: 18
Volume	6	5	0	55: 45: 00
Layers	10	n/a	1	91: 9
Artifacts	7	0	4	64: 00: 36

Figure 27: Figura Site Location of Potential House in Area 1
The stippled line represents the largest dimensions of the potential house while the solid line defines the residential area. The actual post row is highlighted in red.

Figure 28: Figura Site Potential House Ratios



As discussed previously, residential areas at the site were mainly dominated by shallow features, with an overall percentage of 68%:16%:16% for the five identified houses, while non-residential areas averaged 28%:40%:32%, and the non-Areas of 8 and 9 averaged 48%:32%:20%. Area 1, from which the potential house is drawn, averaged 28%:49%:23%. The potential additional residential area had a percentage ratio of 27%:55%:18% for shallow, medium, and deep features, and only one shallow feature occurs within the proposed interior of the structure. In that regard the pattern in this area deviates from residential patterns overall and most closely aligns with the overall average for non-residential areas.

In terms of feature volumes, residential areas at the site were mainly dominated by small volume features, with an overall percentage of 69%:25%:6% for the five identified houses, while non-residential areas averaged 36%:38%:26%, and the non-Areas of 8 and 9 averaged 47%:42%:11%. Area 1, from which the potential house is drawn, also averaged 47%:42%:11%. The potential house area had a percentage ratio of 55%:45%:0% for shallow, medium, and deep volume features. Again, medium sized features are higher in the potential house than seen within the overall average for residential areas, though 45% is consistent with the medium feature representation at Houses 1 and 6. However, only two houses (House 3 and 4), similarly lacked large volume features, and in those instances, medium percentages were only 30% and 20%

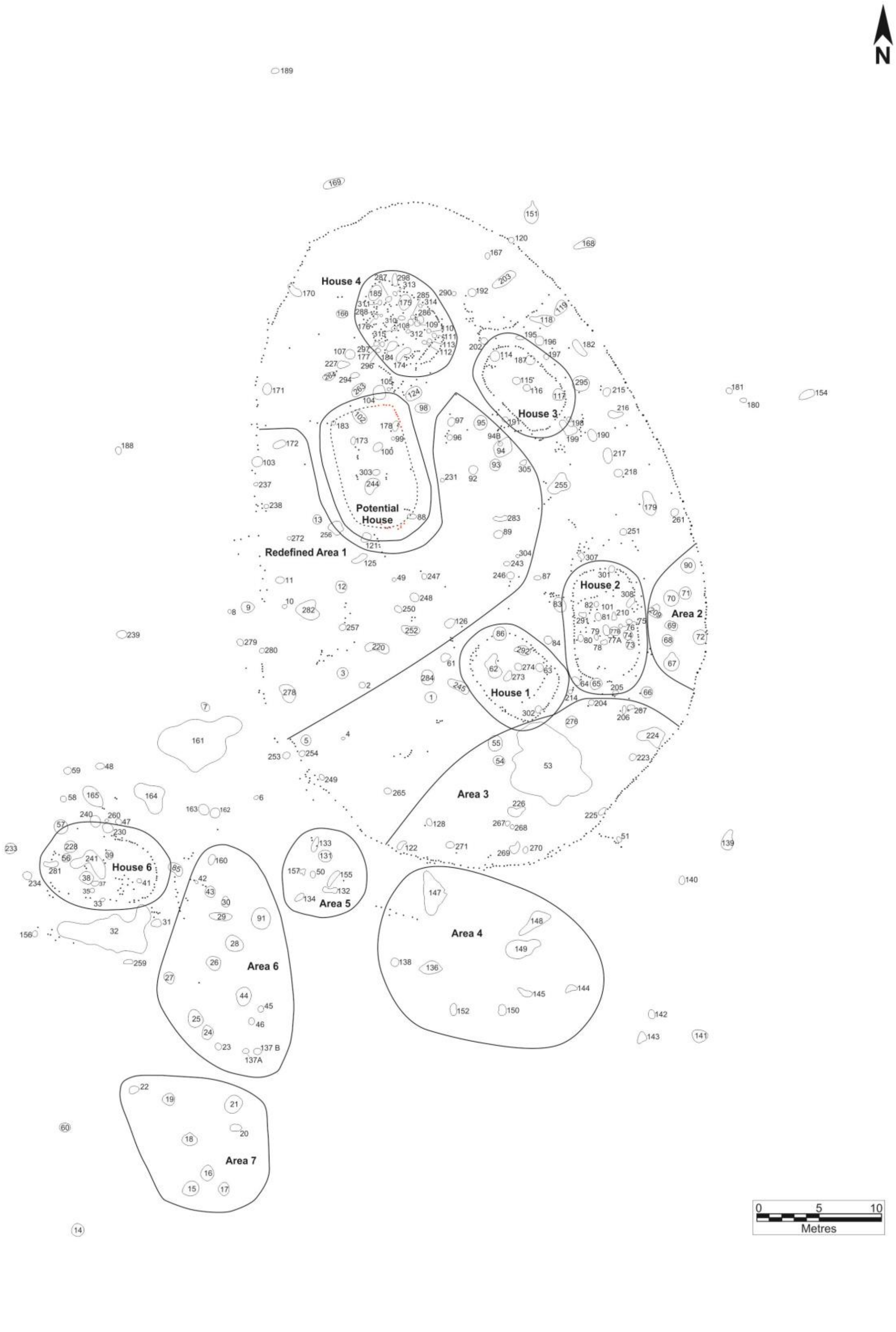
respectively. So, in terms of feature volume, it could be argued that the potential house area is more consistent with residential than non-residential areas, though clearly widening the variability in residential patterns.

In terms of stratigraphic layering, the potential house contains only one feature, inside the suggested house walls, with multiple stratigraphic layers, a pattern consistent with three of the five other houses. Overall a consideration of stratigraphic layers proved of limited utility to discern residential from non-residential areas other than to note their functional concentration in specific non-residential areas of the site. The limited frequency of stratified features in the potential house area is also consisted with the low frequency of stratified features in Area 1 generally (87%:13%), from which the potential house area is defined.

In terms of artifact content frequencies, residential areas at the site were mainly dominated by small content features, with an overall percentage of 76%:13%:11% for the five identified houses, while non-residential areas averaged a generally similar 65%:11%:24%, and the non-Areas of 8 and 9 averaged 78%:15%:7%. Area 1, from which the potential house is drawn, averaged 67%:6%:27%. The general conclusion for this feature attribute overall was that features with very high artifact content generally occurred in distinct non-residential areas, and in proximity to residential areas. The potential house area had a percentage ratio of 64%:0%:36% for low, medium, and high artifact frequency features. The four features with high artifact frequencies were located outside the suggested house, along the possible house wall, and in the center of the possible house. This pattern varies from other residential areas, in that there are more high artifact frequency features in and around the potential house area. It is worth noting that this encompasses two very high frequency features located between the potential house and House 4, and may reflect the tendency to see such features outside but near residential areas as an exterior refuse pit.

If this area were a house then it dramatically redefines the extent of the open plaza area inside the palisade to mainly the area between the palisade and the potential new house (see Figure 29). Conceptually, this would significantly re-configure how space was used across the area inside the palisade.

Figure 29: Figura Site Potential House and Redefined Area 1



However, what is interesting to note is that, even with the insertion of a new residential area reducing the number of features in Area 1 from 53 to 38, this did not change the ratios for Area 1 feature attribute patterns drastically. Generally, shallow features still predominate, volume of features is still almost evenly split between small and large features, there are only a few stratified features, and features with low artifact frequencies dominate. This, perhaps, is the best argument for why the potential house area was not a house: in terms of general feature attribute frequency variations, the potential house area tended to not neatly fall within general residential patterns, and did not neatly fall within general non-residential patterns. However, it did fit most closely with Area 1's particular feature attribute patterns as a non-residential area. These patterns thus suggest the possible house area is just what it appears to be: a part of a large open area, where feature attributes, and uses, were mostly consistent with the specific pattern that encompassed that overall area; distinct from residential areas and other non-residential areas where slightly differing patterns emerged. Notably, these patterns were readily evident by simply comparing percentages for various feature attributes. As a constraint against "eyeballing" and intuition being the means of defining residential areas from fragmented settlement patterns, the internal variation of feature attributes across residential and non-residential areas of the Figura site proved to be a meaningful test in this instance.

4.6.3 The Possible House 5

As noted in the introduction to this section, a fifth house, designated House 5, was initially identified during excavations and analysis by Archaeologix Inc. and Golder Associates (Golder 2012), based on the suggestive pattern of a row of posts. This locale was located immediately north of House 3 and east of House 4. It is represented by an alignment of posts suggesting an end and one partial wall of a house that would have been intersected or closed off by the palisade wall (see Figure 30). This possible house measures 6.54m in length, assuming it ended at the palisade wall, and 4.62m in width based on the fragmented post patterns present. The width of the house fits within the range of house widths that were observed at the site (4.62m to 5.77m), but the potential length is short compared to the range of house lengths present at the site (7.69m to 9.23m), unless the house extended past the palisade wall location (i.e., stood either before or after the palisade wall, though no evidence of a wall is evident past the palisade).

Figure 30: Figura Site Location of House 5

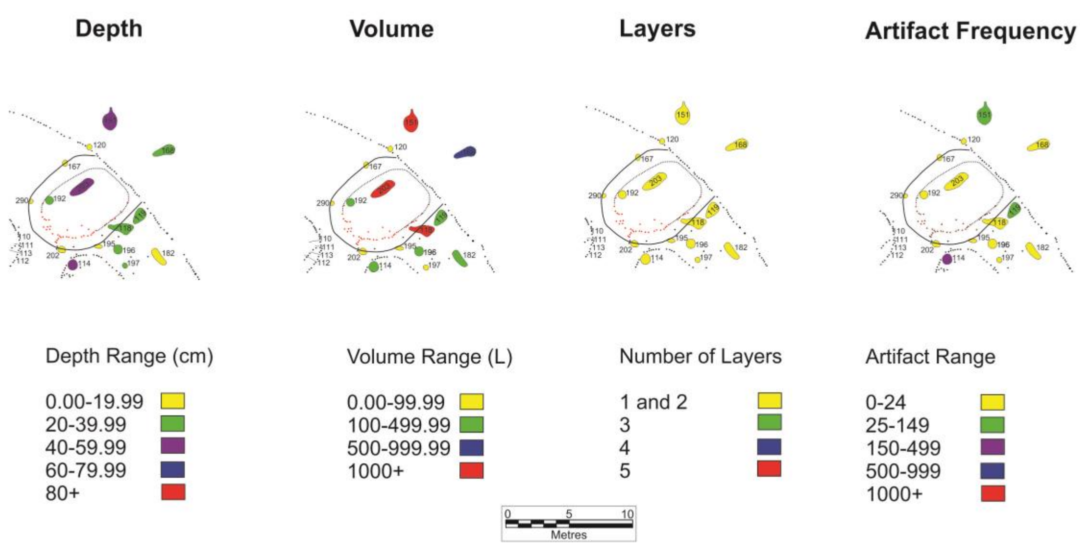
The stippled line represents the largest dimensions of the potential house while the solid line defines the residential area. The actual post row is highlighted in red.

Seven features are associated with House 5, though two of these features, Features 195 and 202, are also associated with House 3. Indeed, if this is an additional residential area, it would be the only case of the limits of two residential areas overlapping on the site. Again, using the percent of features by depth, volume and artifact frequency I will evaluate the possibility that this area is in fact a house. For the sake of this analysis, the features (Features 195 and 202) overlapping with the House 3 residential area will be used, since it is not possible to rule out this association. I should mention that the small number of features overall for this area limit the interpretive utility of this analysis. However, I still believe it is warranted to at least consider this area given the initial assertions made during excavation and analysis. Figure 31 illustrates the depth, volume, layers and artifact frequency percentages and ratios visually and Table 27 lists the attributes by groupings for House 5.

Table 27: Figura Site Percentages and Ratios for House 5

House 5	Shallow/Small/Low	Medium	Large/Deep/High	Percentage
Depth	4	2	1	57: 29: 14
Volume	4	1	2	57: 14: 29
Layers	7	n/a	0	100: 00: 00
Artifacts	7	0	0	100: 00: 00

Figure 31: Figura Site House 5 Ratios



Possible House 5 had a percentage of shallow to medium to deep features of 57%:29%:14%. Generally speaking, this pattern is similar to non-residential Area 3, House 3, and non-Area 8. By feature volume, possible House 5 had a percentage ratio of 57%:14%:29% small to medium to large volume features, a pattern not replicated within any of the other residential or non-residential area of the site. In terms of features by artifact frequencies, all seven of the features had low artifact frequencies, though it is worth pointing out that Feature 119, immediately south of this area, was a medium frequency feature. Nonetheless, as artifact frequencies are dominated solely by low frequency features, possible House 5 is only similar to Area 5, which exhibited the same pattern and number of features, and Area 4, which had only one medium frequency feature out of nine overall. An argument could be made that House 4, with only one medium and no large frequency feature, is similar, however the high number of features overall for House 4 (n=25), makes that pattern rather distinct from House 5.

The area encompassed by possible House 5 tends to exhibit distinct patterns from other areas of the site. Where it is generally similar, it more often emulates non-residential or even non-Area patterns (i.e., random patterning), rather than a residential pattern. While the post alignment is suggestive of a structure, possibly building onto the side of the palisade wall, it seems likely that this structure, and whatever purpose it served, was utilized for something other than general residential activities.

4.6.4 Possible House Identifications Summary

Thanks to the clear and mostly distinct settlement patterns available for Figura, relatively subtle distinctions in feature attributes can be observed across residential and non-residential areas. Those patterns suggest that even subtle variations from any portion of the site that may be masking additional houses to those readily visible should be identifiable by feature patterning. Given that initial fieldwork and analysis led to suggestions that additional houses may be present, and that, if so, this may have important implications for understanding the overall community pattern at Figura, I felt it was worth testing these eyeball musings.

Neither of the locales explored in detail exhibited patterning within the range of residential spaces defined across the site. Additionally, I should also mention that the other locale field investigators wondered about, to the east of House 6, quite readily fails to align with residential feature attribute patterns (in part because the non-residential pattern for Area 6 that encompasses this area indicates a distinct pattern of feature use). I should caution that this is not to say that structures were not present in these areas, but that if there were, these structures did not support general residential patterning, and generally the locales reflect similar feature patterning of attributes for the area they are a part of (Area 1, Area 6, non-Area 8).

What this does suggest, however, is that both the patterning seen in the residential and non-residential areas of the site, and variations to those patterns across areas, align well with what this exercise tends to confirm is a complete and relatively accurate portrayal of community patterning at Figura. Indeed, this exercise also tends to confirm that the logics I used to define areas across the site was not arbitrary and captured meaningful internal consistencies to feature patterning observed for these areas. These patterns, at least in the context of the Figura site, do help define residential living space from non-residential space, and define variable patterning across non-residential areas. Ultimately, this exercise demonstrates the limits of a speculative guessing of residential spaces based on fragmentary rows of posts. While beyond the scope of this thesis, it would be interesting to undertake similar analyses of feature attributes by areas proposed as residential for some of the other Arkona cluster sites documented where only fragmentary settlement data is available (e.g., Location 9 and 12).

4.7 Discussion

The Figura site is made up of many features of different shapes, sizes, depths, and content, and are found in many different locations across the site. The main goal of this analysis was to determine the composition of features in different areas of the site, specifically residential and non-residential areas.

At the Figura site, medium and deep features were more common in non-residential areas, though across these areas there was a variation in the ratio of shallow, medium and deep pits, which suggests that different activities took place in different areas, requiring a wide variety of pit forms (Green and Sullivan 1997:4). Since shallow, medium and deep pits occur near one another in all areas at the site, it suggests that most activities required some combination of differing pit depths, or that different activities occurred side by side in most areas of the site. Whether these activities were occurring at the same time or at different times is difficult to tell. As indicated in Chapter 3, shallow pits are most likely associated with short term activities such as smudge pits, pot holders, curing pits and short term cache-like functions (Stewart 1975:89), while deep pits are associated with caching, food preparation and storage (Bendremer et al. 1991:344; Bursey 2003:212-213; Green and Sullivan 1997:12). Perhaps shallow pits were used to prepare food before storing it in larger nearby pits. It could also be that areas of the site dominated by shallow pits were used to prepare foodstuffs or hides that were then moved to different areas of the site (i.e., Area 2 or 6) for storage.

Residential areas were mostly dominated by shallow features. The medium and large features associated with houses were limited and either located along a house wall or within one meter of the house. Very shallow features in houses makes sense functionally as they would be less likely to interfere with activities taking place in and around the house (Hatch and Stevenson 1980: 169). These shallow features would also have had a temporary or short term use life.

The pattern of deep vs shallow features across the site is duplicated by volume size. Certainly the shallow features which dominated residential areas were also small in size. On average, non-residential areas at the site are mostly comprised of equal percentages of feature sizes, with medium and large volume features tending to cluster together in certain areas, particularly Areas 2, 6 and 7, indicating that activities that only required large features could be an exclusive focus of feature use in certain areas of the site. At the Faucett site Moeller (1991:20) noted that pits within a cluster were very similar in morphology and appearance. Large volume features at Figura appeared in most non-residential areas, but their clustering in Areas 2, 6 and 7 suggests these features, as communal or personal storage receptacles or refuse disposal pits, served a primary aim for these spaces of the site, the concentration of these features perhaps arising through a process of replacement, i.e., when a storage feature was deemed unsuitable for further storage a new storage feature was dug in the vicinity of that unusable feature.

Stratified features were few across all areas of the Figura site, suggesting this attribute offered only limited additional insight to distinguishing feature use across space at this site.

Artifact frequencies did reflect variability across the site, with concentrations of high refuse features aligning generally with areas of large and deep features. Nonetheless, overall low artifact yielding features were the most common in most non-residential and residential areas. Features with high artifact frequencies tended to cluster together in certain non-residential areas, such as Area 1 and Area 6. This clustering could be explained by the activities taking place in these areas, or because people tend to dump trash where others have previously dumped trash; a tendency that gives rise to concentration (Schiffer 1987:62). Residential areas were dominated by low artifact frequencies. Most houses had at least one feature with a high artifact count in or near them, generally located along the edge of the house or just outside.

Based on my analysis, there are differences across individual residential areas and individual non-residential areas, but more generally there are consistently some differences in the patterns seen for residential areas generally, and for non-residential areas generally. While most of these differences are quite subtle, they are still notable.

Volume proved to be the best indication of a residential vs. non-residential area, as residential areas tended to lack larger features or only had very few. Depth, which could be argued is an attribute that closely aligns with volume, also proved to be distinct in the two area types, with non-residential areas typically containing a larger number of deeper features than residential areas. Most other attributes tended to underscore a distinction for a particular area of the site (e.g., stratigraphy, artifact yields, tools, and vessel), than they did for distinguishing a general difference across all residential areas of the site vs. all non-residential areas of the site. Likewise, none of these attributes generally revealed marked differences between inside palisade and outside palisade trends for Figura.

Features served a diversity of specific and generalized needs in the daily living across the Figura site, and may well have served more than a single need at any given time in their use life, or in the use life of the areas they were found in. Residential and non-residential areas had slight differences that built up over the time those areas were in use, and some non-residential areas tended to, over time or by design, reflect a focus on, in particularly, large, deep and refuse filled features so that they appear as notable concentrations compared to other areas. These patterns reflected a particular need for large features served at specific locales across the site, while the ubiquity of smaller, shallower and less artifact-filled features across almost all areas of the site suggest that the diversity of needs such features met was the most common role features played day to day. It is the absence of deep, large and artifact rich features, or their limited presence versus concentration in each area that begins to point at possible variations across residential and non-residential areas, and between non-residential areas of the site. Unfortunately, feature morphology and attributes on their own, despite the range of feature typing exercises I reviewed in Chapter 2, cannot get at feature function in the absence of considering site context, something the discrete settlement patterns of Figura better allowed for.

Chapter 5

5 Conclusion

This thesis used spatial analysis and feature attributes of depth, volume, stratigraphy, and artifact content to determine if patterns could be identified from the features at this site, and specifically if residential and non-residential areas could be distinguished from each other. As the settlement pattern and resulting residential and non-residential areas of the Figura site are relatively well defined, this site offers the chance to study different feature types associated with different areas of the site with relative ease, and test whether feature variability across the site could afford insights that might have utility beyond the Figura site.

This analysis was performed by dividing the 271 features from the site into defined spaces or areas, each representing concentrations of features or structures, and defining inside and outside palisade spaces. Non-residential spaces were divided into nine areas based on visible concentrations of features, five of which were located outside the palisade. Residential areas consisted of five houses and a one meter arbitrary area surrounding the exterior of the house wall, four of which are found inside the palisade.

Attributes of depth, volume, stratigraphy and artifact content were divided into groupings of mainly low, medium and high, based on arbitrarily defined ranges of size or frequency. The number of features in each area was recorded and grouped by attribute sub categories. The ratios and percentages of sub categories for features in a given area were then compared and contrasted to all other areas to illuminate different patterns across the site. Ratio and percentage allowed different areas of the site to be compared when the number of features in each area differed. This type of analysis also allowed the features and areas to be compared by one attribute at a time, and to build up patterns of similarity and difference as additional attributes were considered. Given the small sample size area to area, and sub-categories in each area, basic percentages proved sufficient to draw out any notable patterns across areas of the Figura site.

The results of this analysis suggest that non-residential areas of the Figura site are comprised of a full range of feature attributes, but with tendencies towards more medium and deep features, more medium and large volume features, and predominately low artifact frequencies but with some high frequency features in these areas, too. Residential areas are comprised of features with shallow depths, a very few deep features, small volume features, and generally with low artifact frequencies.

Based on this analysis it can be concluded that the site does differ in its residential and non-residential areas. While some of these differences are quite subtle, there are still real differences. Volume proved to be the best indication of a residential vs. non-residential area, as residential areas had more small features while non-residential areas had more larger features. Depth also proved to be distinct in the two areas, as non-residential areas contained most of the deeper features on the site. Artifact frequency did provide some insight into residential vs. non-residential areas, although it was less pronounced than volume and depth.

The differences in feature use across these areas demonstrate that the people at this site were working and living in different areas and those different activities left a physical mark on the landscape. Moreover, while residential areas are relatively uniform in feature representation, it is clear that non-residential areas, notably Area 2 with its exclusive use of deep features, Area 6 and Area 1 with a range of feature uses and inter-connections between these two areas, all suggest that space was ordered, and that, while features served many functions in day to day life, variable uses were repeated in specific locales enough for differences in feature patterns to stand out.

This research can be applied to new and existing archaeological sites. By examining specific feature attributes closely and spatially, more information can be gleaned about the use of space at a site and potentially the social and functional uses of space at a site. It can also allow for sites without feature profile drawings to be interpreted in new ways and compared to other sites, as well as sites lacking post data, a not uncommon issue for Late Woodland Western Basin sites. In effect, by looking at specific attributes the social dimensions of features themselves are considered when analyzing a site, and not just regarded as the context receptacles for “stuff”.

5.1 Typological Approaches

The objective of this thesis was to analyze the features from the Figura site to gain insight into these unique contexts and how they relate to the occupation of this site. As such, a different methodological approach was used to gain insight into features from the site and a typological approach was not used. As discussed in Chapters 2 and 3, feature form, consisting of feature size and shape, is most frequently used to classify features into types, as feature form is felt to be most closely related to the primary or intended function of a feature (Dickens 1985; Green and Sullivan 1997:2; Stewart 1975:149). Feature form was used to classify features in the majority of the literature reviewed for this study (e.g., Dickens 1985; Dunham 2000; Fox 1976; Green and Sullivan 1997; Hatch and Stevenson 1980; Lennox 1982; Means 2000; Stewart 1975; Timmins 1997; Wilson 1985). Beyond size and shape, some scholars also incorporated additional attributes in their classification, including volume (e.g., Means 2000; Timmins 1997), and landscape location (Dunham 2000).

The main goal of classifying or typing features in the literature tends to be to get to a point of assigning function to that class/type of features. This aim, however, is problematic as features are usually typed or classified using a few select attributes that vary based on the researcher (Stewart 1975:31). Stewart's (1975) research represents an early study of feature attributes and functions, and served as an important basis for later feature studies, either directly or indirectly. Stewart used a series of 13 measurements taken along the profile of features and some fill attributes to develop a classification of features. Stewart then turned to the ethnographic record to help determine feature function, although she was unable to determine functions for each feature type she identified. Ultimately she only assigned functions to the smallest and largest types of features, as small and large features were the only ones described in the ethnographic record (Stewart 1975). While Stewart was certainly a pioneer in feature analysis, her reliance on the ethnographic record to interpret function was very limited in scope, which she was aware of, and she notes that the relationship of pit form to pit use is not obvious in the archaeological record (Stewart 1975).

As with Stewart's realization of type limitations, I feel this study has also shown that typologies are of limited interpretive use for studying features in detail. Using feature form to create types is problematic for a number of reasons, including that features could and did change shape over time and use. If a feature was re-used and re-dug over time the overall shape (and potential size) of the feature could change from its original shape. For example, if storage pits were re-used and their contents retrieved over time you should expect that the profile shape of the feature will change as the contents are retrieved and the pit inspected to determine if it can be re-used. There is also animal disturbance to consider, especially if there are food remains present (Timmins 1997:153-154). Other natural disturbances such as wall collapse, or slumpage, could also mask the original shape of a feature, making typing exercises more arbitrary.

In my attempt to type the features from Figura based on profile shape (Chapter 3) I found that I was either lumping features together based on a general classificatory form, or creating many types represented by only a few features based on slight variations in profile form. In reality, profile, shape and size were on more of a continuum, in that they blended together and had no clear delineation, making it difficult and arbitrary to impose types (Means 2000:49).

Ultimately, I chose to consider a range of specific attributes to analyze the features from Figura, spatially grouped by visually distinct areas across the site. One of the positive aspects of this attribute based approach to feature analysis is that it lessens observer bias, in that feature depth or volume are easily defined attributes. Admittedly, I was still grouping each attribute into relatively arbitrary, usually small, medium and large categories, but these were arbitrary absolutes (e.g., if Feature 1 was less than x cm or x litres, it would fall in the small category), and not subject to my second guessing or inconsistent categorization of form-like classification. Another positive was that it allowed me to consider each attribute separately to explore patterns and spatial variation, and then build up those trends as additional attributes were considered. This allowed for a consideration of how different attributes complemented or played off each other to reveal patterns across the site.

By exploring individual feature attributes and their relationship to spatial and settlement patterning across the site I feel I was better able to get at general intentions of feature and area use across the site without the need to type feature functionality.

5.2 Refuse and Storage Pits at Figura

Two “types” of undifferentiated features (i.e., not otherwise self-evident, such as ash pits, hearths, etc.) tend to be most commonly used in archaeological literature and CRM reports describing Late Woodland sites: storage and refuse pits. These two functional feature types are ubiquitous in descriptions of archaeological sites regardless of time period or cultural affiliation, or at least according to the archaeologists interpreting those features. The distinction between storage and refuse pits usually depends on the amount of material recovered from a feature, with the presence of many artifacts indicating refuse pits, and a lack of artifacts indicating storage pits. The definitions of each feature type are loose, such as “storage pit: any hole too big to be a posthole” (Bahn 1989:62, cited in Green and Sullivan 1997:1), or “the presence of broken bones and pottery” confirming a feature was a refuse pit (Stewart 1975:91). Indeed, Stewart (1977:149) noted that “storage and refuse pits were often the same” as they were reused over time.

Certainly, as noted in Chapter 4, some features at Figura contained large quantities of material remains. Features with large numbers of artifacts cluster in Areas 1, 2, 6 and 7 suggesting that these served as disposal areas, or that specific activities occurred in those areas that generated large numbers of material remains. Features with high quantities of material that cluster together should not be surprising generally, as refuse tends to be dumped where others have dumped refuse, forming concentrations of refuse (Schiffer 1987:62). The differences in refuse deposited in features can be the result of differences in the temporal use of an area, differential artifact disposal practices, seasonal differences, differential preservation of artifacts (Fowler 2011:153; Schiffer 1987:71), or from different uses of particular activity areas (Garrow 2012:103). Indeed, the disposal of artifacts is the last part in a long series of events in the use life of artifacts, and their disposal can fluctuate based on the inherent differences in everyday life (Garrow 2012:111).

As noted in Chapter 4, most features at Figura were either devoid of artifacts or had only small quantities of debris. Such features ranged from small, shallow features that were clearly expedient in use, to large and deep features that nonetheless were not the focus of refuse management choices. But clearly the logics of a generic distinction between refuse and storage pits – quantities of artifacts present in the feature – means features are rather arbitrarily assigned to one of two "types" based on final disposition of material remains, and this denies a proper interpretation of a feature's use-life. Refuse/artifact placement in a feature can represent one of the last steps in a long use-life of the feature, so simply saying that a feature with artifacts in it is a refuse pit potentially disregards a more complex life history to the pit.

The term refuse pit is misleading, as most archaeologists agree that pits were not necessarily dug specifically to hold refuse, but became repositories for refuse once their original function was abandoned or no longer needed (e.g., Dickens 1985:42; Green and Sullivan 1997:3). Likewise, referring to features with low or no artifacts as storage pits masks the diverse range of intended uses that criterion encompasses, and distinctions due to particular contexts those features are found in (e.g., between residential and non-residential areas).

By using storage and refuse as a core functional division for features on sites, archaeologists are relying on only one aspect of the feature – its content or lack of content – and as such potentially limit their interpretations, when other readily accessible attributes and a consideration of spatial context can offer a wider insight into the role features played.

5.2.1 Area 2 as Storage/Caching

Notwithstanding the limitations of designating features as storage or refuse pits solely by artifact fill, the spatial analysis of features across the Figura site did show distinct concentrations of larger, deeper features, with variable quantities of material in them. Area 1 and Area 6 were both discussed in some detail in Chapter 4, but another area of the site, Area 2, is worth also considering as a distinct cluster of features. Area 2 is found within the palisade, and located between the palisade wall and House 2. This area of the site is composed of eight features that are predominately deep, have medium to large volumes, and six of the eight features have low to medium artifact frequencies. These features could potentially be interpreted, not simply as "a hole too big to be a post mould," but as storage or cache pits, as documented extensively in the ethnohistoric record from the lower Great Lakes, and archaeologically characterized by their large size and depth to serve an enclosed, "cold cellar-like" storage function (Dunham 2000; Ferris 2009; Murphy and Ferris 1990; see also Chapter 2). If we are to assume that some of these features were indeed primarily intended as storage pits, their specific clustering in Area 2 is interesting. The placement of these features adjacent to the house structure and up against the palisade wall appears to limit access to these features, suggesting a possible private or controlled space exclusive to the inhabitants of House 2?

In Area 2, seven of the eight features fell into the deep category, while five of the eight features had large volumes. Two of the eight features contained high artifact frequencies while another two features had medium quantities of artifacts, and all four were measured as containing higher quantities of refuse. None of the features contained any ceramic remains that could be cross mended to other areas of the site. If we assume refuse is an end state for the use-life of features, then at least two of the features (Feature 70 and 72) may have been replaced by other features in this cluster over the time features were used here. What is clearly absent from this cluster are frequencies of small, shallow features seen in most other areas of the site, or large numbers of large, artifact rich features, such as seen in Area 1 and 6. In other words, this relatively tight and small cluster of features likely served a singular purpose through the use of large deep features. No post molds were identified in the area, ruling out a potential structure over the pits (i.e., Bursey 2003; Hart 1995). That the high frequency of deep features in this area is set apart from the rest of the site may have ensured these large, deep features would not interfere with daily life at the site (Hatch and Stevenson 1980:169), though clearly that could not have been the sole consideration in using this area, since deep features are found in several areas across the site.

The isolated nature of Area 2 (notably distinct from the space between either House 3 or 4 and the palisade in those areas of the site) is suggestive of a private space. While cross mend data for Figura would seem to preclude a simple assumption of proximity confirming which household residents predominantly used features in particular areas of the site, nonetheless the space of Area 2 would suggest a close association with House 2. So, if these storage pits were only accessible by the inhabitants of House 2, did that mean that no one else was able to use them? In other words, were they serving a proprietary need of the House 2 inhabitants? If these potential storage pits were the "property" of one household, this could imply some social hierarchy at the site and less than communal ownership of all resources. If so this may reflect the rationale behind a broader pattern of deep storage pit use seen on some Western Basin Late

Woodland sites from this period. Sites such as Robson Road, Cherry Lane, Bruner Colisanti, Kreiger, and Dymock (Murphy and Ferris 1990) are notable for clusters of large, deep pits, interpreted as storage pits, located in open areas of those sites. Perhaps these clusters also were "property" of specific individuals or families, though the absence of clear residential spaces and palisades on those sites also suggest more open access than seen for Area 2. It could also be that these features were used to cache material goods as well as food, so taking advantage of the privacy between the palisade and house provided another layer of protection or control over access to the material (DeBoer 1988; Dunham 2000; Ward 1985).

What is distinct from Figura and the other sites mentioned is the absence of discrete and clear settlement patterns documented at those other sites. Robson Road, Krieger and Bruner-Colisanti had no discernable settlement pattern or residential structures, excavations at Dymock were too partial to reveal clear patterns, and Cherry Lane's single documented house, was set apart from storage pit clusters. Perhaps Area 2 was simply an opportunistic use of a discrete space generated by the placement of House 2 close to the palisade. But perhaps it is also possible that this private placement of large deep features to store or cache materials at Figura was the result of the "borderland" the site is situated in, and a reflection of the inhabitants of the site adopting practises similar to Early Ontario Iroquoian people, as there is evidence of storage pits being associated with specific households from that Late Woodland tradition (Smith 1986; Ward 1985:86; Wright 1986).

It could also be that this specific area at Figura was best suited for a kind of storage requiring protection from the elements due to its location between the house wall and the palisade wall. On some Early Ontario Iroquoian sites storage pits were found along palisade walls and along house walls (Timmins 1997:149). It could simply be that one storage pit was dug here and once it was no longer deemed usable (i.e., due to slumpage or rot), another one (or two) pits were dug in the same area, or that they were dug at the same time to provide specific large scale storing or caching needs best served by this specific area. Regardless of the particulars that led to its formation, Area 2 can be distinguished from other areas of the site precisely because of the detailed settlement patterns documented for Figura, allowing us to at least contemplate such fine-grained patterning and consider the implications of those patterns for other contemporary sites lacking such detail.

5.3 Implications of the "Missing" Storage Pits at Figura

As noted in Chapter 3, my "Type A" category of features – 23 features in all (7.64% of all features) – conventionally best fits the quintessential definition of the large storage or cache pits noted for the Western Basin Late Woodland (Murphy and Ferris 1990).[5] For a site of this size and time period, the paucity of such pits is worth considering. After all, the predominance of large storage or cache pits from this period of the Western Basin Late Woodland has served as a key interpretive rationale for explaining high maize isotopic signatures (indicative of year round consumption of maize) among Western Basin populations at this time, in that these pits suggest storage and caching of surplus foodstuffs played a key role in ensuring a steady supply of maize into the foodways of this group (Dewar et al. 2010; Watts et al. 2011).

Limited isotopic data from human remains recovered from the adjacent Arkona cluster site known as Location 9 suggests that local maize consumption levels were sustained year round (Spence et al. 2010). There have also been some limited isotopic data retrieved from Figura that suggests animals consumed by the inhabitants were themselves consuming maize. Booth (2015) found that bear and dog remains from Figura show evidence of maize consumption in their diet, although at lower levels than for humans. Morris (2015) also found that dogs and racoons recovered from the site consumed maize at similar levels to those she documented for contemporary Ontario Iroquoian sites. The recovered floral remains from the site show that maize was present in the fill of numerous features, including Features 24, 55, 65, 79, 83, 85, 94 and 103. Given these data, it is likely that maize played an important part of the diet of people at Figura. However, the feature data suggests caching food supplies at this locale was not as critical as seen elsewhere during this period.

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[5] Of course, I also acknowledge, as I did in Chapter 3, that the "Type D" form of feature overlapped with "Type A," so the total number of quintessential Western Basin storage/cache pits at Figura could be more, or less for that matter. But for sake of this discussion it is fair to consider the 23 features that are closest to what researchers have referred to as Western Basin cache pits.

Perhaps the lack of storage facilities at the site is indicative of the relatively short duration of the site's use, also suggested by the lack of overlapping features. Not all Late Woodland Western Basin sites from this period are notable for large numbers of storage/cache features, as seen for example at the Van Bemmel site (Ferris 1989:18; Murphy and Ferris 1990:242-243), interpreted to be a short term colder weather encampment. However, it is also clear that Figura is much more substantive and organized as a community pattern, and presumably not functioning as a seasonally short term occupied site.

It could also be that the site was occupied at a time of the year when storage facilities could not be dug as the ground was frozen. The limited faunal analysis performed at the site indicates a cold season occupation during the fall and winter months. This is based on the limited presence and/or absence of small mammals, migratory birds, fish and reptiles (Foreman 2013). However, the sandy soils of the site would not have been too prohibitive to excavate in colder weather. Moreover, there are large, deep features on the site, so presumably if large numbers of storage/cache pits were needed, they could have been excavated.

Certainly, the small number of large pits on the site could have been used for caching. Notably, Feature 100 contained two metates. These objects were very large and heavy, so they might have been too big to move from site to site, meaning that they could have been stored in this feature to be retrieved at a later date.

Finally, it could also be that the lack of storage pits was due to the activities carried out at the site, in that storage through use of storage/cache pits was not an important component of those activities, and storage was serviced in another manner. It is worth noting, for example, how unique the settlement pattern is at Figura, which may suggest this kind of more permanent, enclosed settlement, compared to the patterns observed for Western Basin sites where there are high concentrations of cache pits, allowed for other ways of consuming and storing foodstuffs. The sense of permanence the palisade and house structures afforded may have, for example, allowed storage to be above ground, or otherwise in receptacles/locales other than deep pits.

5.4 Exterior/Interior Palisade Space and House 6

House 6, located outside of the palisade, posed an interesting research question in this thesis. Since this house was located outside the palisade and appeared to be associated with an activity area and midden, its association with the rest of the settlement patterns across the site, and whether it was contemporaneous with the rest of the site, remained unclear.

Houses at this site are of a similar size and shape, but vary in the number of features in and around them. Within the five houses there is no apparent organization of features, as features vary in depth, volume and their placement on the house floor. The number of features varied greatly from house to house. Generally, Houses 1 to 3 exhibited clear wall patterns, while Houses 4 and 6 each exhibited either missing wall sections or masked sections by features placed along the wall line.

House 6 contained the greatest number of deep features with five. Three of the deep features were located within the house, and two outside the house walls. Deep features in the other houses were located along the edge of the interior of the house or immediately outside the house walls. By feature volume House 6 was also like House 1, in that they both had a similar distribution of small to medium to large volume features. Like depth, large features were exclusively found outside of house walls for Houses 1 to 4, while House 6 has one large volume feature inside the house. By artifact frequency, House 6 is distinct by a lack of artifact rich features inside the house wall, with only House 4 likewise lacking high yielding features from the interior. Like House 4, there are higher yielding features on the periphery of House 6, or just beyond it. Generally speaking, cross mend data generally exhibits limited connections between the interior and exterior of the palisade, with only Area 6 clearly associated with interior palisade areas. The only cross mends in House 6 connect to nearby features (though not, curiously, the immediately adjacent midden).

Based on the limited faunal analysis that was performed on a few features from the site, Foreman (2013) determined that species associated with a warm season occupation (e.g., fish, bird, reptiles and invertebrates) were more commonly identified in features located outside of the palisade than from features inside the palisade. Unfortunately, the faunal analysis was too limited to confirm that distinction, though it does raise the additional possibility that the exterior area and House may have been less used before or after the palisaded area's period of use, and used differently during the life of the settlement, this is, inhabited during a period of the year when the residents from the interior of the palisade were not there, but away at other locales. Overall, when looking at House 6 feature data, it cannot be conclusively said if it was occupied at the same time as the rest of the site or not.

5.5 Comparing Figura's Settlement and Feature use to Bingo

The lack of overlapping features at Figura is indicative of a few things; i.e., that the site was not occupied for such a long period of time that major renovations to structures were needed, or that features had to be re-excavated into previously used features. It may also be that the locale was not occupied year round (i.e., consistent with broader Western Basin patterns from this time, residents may have travelled elsewhere to more specific-purpose camps and resource procurement areas). If this was the case, periods of absence could have reduced the need to overlap pits over the life of the settlement.

I should add that there is not a total absence of feature overlap. There is some overlap of features present in Houses 2 and 4, indicating that these houses could have been occupied longer than the other houses, or that more or different activities took place in those particular houses at various points in their use-life. As well, the fact that some areas of the site attracted specific feature use tendencies, such as Area 2 and 6, suggests that longer term use, where functional needs of space would have changed over time, did not occur to any great degree. Overall, the Figura settlement pattern is quite distinct from sites such as Krieger, Robson Road and Bruner-Colisanti, where formal settlement patterns and palisade were absent but extensive feature clusters and overlap are noted, or for sites like Cherry Lane, where feature clusters are away from residential areas, and feature overlap is seen in each area.

The Bingo Pit site (AgHk-42), located approximately 2 km north of Figura, offers a very different settlement pattern (Golder 2006). While Bingo is of a similar overall size to Figura (approximately 75x65m), Bingo has a much denser settlement pattern consisting of four structures (including 3 longhouses) and a two-three rowed palisade. Bingo also has a much more intensive use of features across the site, including large clusters of overlapping features in both residential and non-residential areas of the site, more intensive activity inside the palisade, and much less activity occurring outside the palisade. Bingo consists of 593 features (Golder 2006:175) in all, and notably includes extensive use of large deep features, linearly aligned, inside residential spaces.

The complex settlement pattern at Bingo is indicative of a very different community organization and, critically, feature use than seen at the Figura site. This could speak to a larger population active inside the Bingo site for longer durations of the year, and perhaps over a longer use-life than seen for Figura. The high number of features present at the site, as well as extensive patterns of feature overlap, indicate an intensive occupation of the site, something not seen at Figura. The large number of overlapping features shows that there was no avoidance of old features and perhaps the space within the palisades was limited, so older features could not be avoided during excavations of new features. It also suggests that being able to define distinct Areas by feature variations may prove more challenging for Bingo than it did for Figura.

It is worth noting that the other Arkona cluster sites (Van Bree, Inland West Pit Locations 3, 9 and 12) display a wide range of settlement patterns. For example, Van Bree includes a distinct, small house similar to Figura, and clusters of non-overlapping features to either side of the structure (Cunningham 1999, 2001). Location 3 of the Inland Aggregates sites exhibits discrete feature patterning suggestive of one or two houses, and another cluster of sequentially overlapping features (Suko 2017). Notably the linear alignment of features is interpreted as being inside a house structure like the patterns seen in the Bingo structures. Of the other substantive Inland Aggregate sites, partial excavations of Location 9 and 12 exhibited palisades and a lack of overlapping features, making them appear more consistent with Figura than Bingo (see Golder 2012).

5.6 Future Research

The type of fine grained analysis of feature data undertaken for the Figura site has the potential to help infer settlement patterns, functional activities and social relations at other Western Basin sites that lack clear settlement data beyond the presence of features. This type of analysis could also help re-interpret existing Western Basin sites in a new way.

As with any research, there are limitations to this study. This research focused on specific attributes of features from the Figura site, and drew out interpretations based on the clearly delineated and distinct contexts identified across this site, and as such might not be applicable to other sites.

Another limitation of this study is that all of the attributes I examined, and the categorization of scale for each attribute, were chosen arbitrarily, with attempts to capture intentionality of the people who created the features. It would be extremely difficult to pinpoint when different depths, volumes, number of layers and artifact content become significantly different so as to imply categorical difference. That said, the patterns I did come up with were not hard constraints, recognizing that categorical preciseness from the plough disturbed, topsoil stripped and shovel shined surface of this site was not attainable. Instead, that general tendencies of differing feature patterns did emerge across the site and between residential and non-residential areas confirms that these attributes, however arbitrarily separated, do reflect variable activities aligned with spatial contexts.

The limitation of this kind of feature analysis is realized more in the need to account for other datasets to build from the patterns identified. For example, full floral and faunal analyses could provide additional insight in differences across the site, while a detailed study of the ceramics from defined residential areas might help to determine if pottery was organized at the household level, or was a site-wide activity (see Suko 2017; Watts 2006).

It is my hope that the feature analysis undertaken at Figura can be applied to other Western Basin sites that lack clear settlement data, to help determine the layout and potential function(s) of a site based on their features. This type of analysis could also help tease out patterns at more complex sites, such as the Bingo site located nearby. Given the role that features play in the life of past populations it is important for archaeologists to move beyond questions of simple typology (i.e., storage or refuse) when looking at features.

Now to answer the question posed in the title of this thesis: if pits could talk I'm sure they would tell us of their unique life histories and that they hold more information than we give them credit for, if only we dig a little deeper into them.

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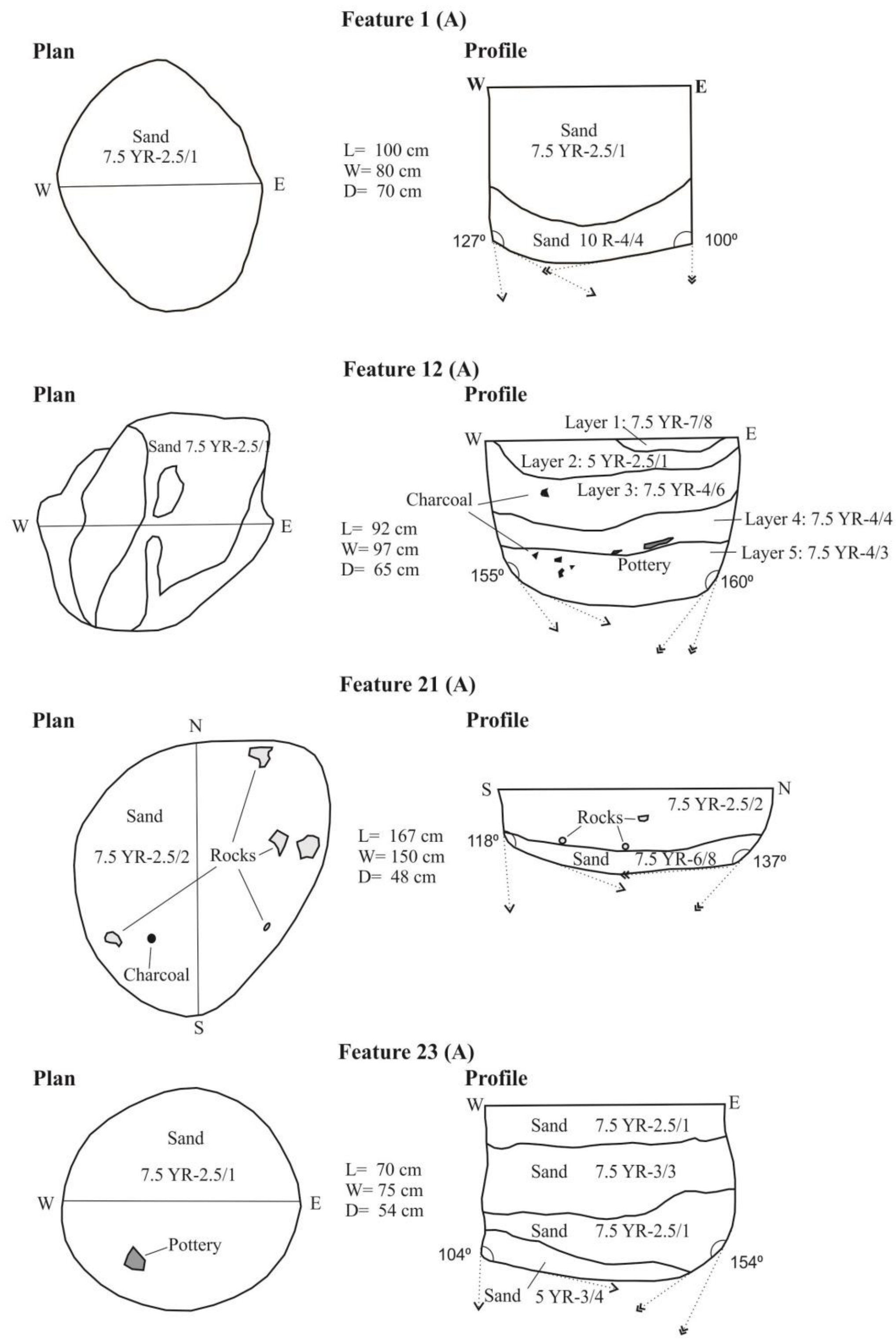
Appendix A: Feature Type A & D Base Angles at Figura

Table 28: Figura Site Feature Sample Base Angles

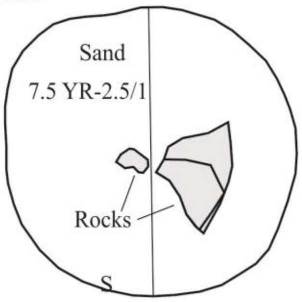
Feature	Type	I/E	Angle 1	Angle 2
1	A	I	127	100
12	A	I	155	160
21	A	E	118	137
23	A	E	104	154
24	A	E	146	130
25	A	E	130	140
70	A	E	145	140
92	A	I	155	150
100	A	I	140	130
114	A	I	160	142
5	A	I	136	103
Average			**136.45**	
Range			**100**	**160**
9	D	E	130	147
28	D	E	151	164
68	D	I	149	162
72	D	I	148	142
85	D	E	145	158
86	D	I	160	162
90	D	I	146	155
91	D	E	154	164
104	D	I	164	145
173	D	I	147	147
Average			**152**	
Range			**130**	**164**

Figure 32: Figura Site Sample Base Angles (not to scale)

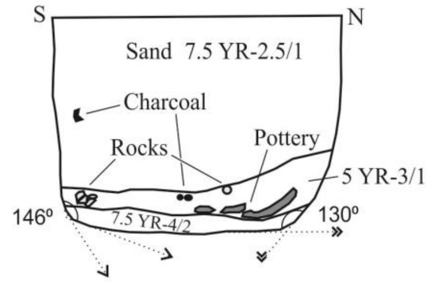


Feature 24 (A)

Plan



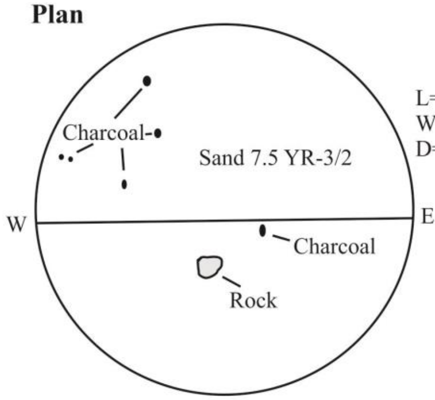
Profile



L= 110 cm
W= 110 cm
D= 82 cm

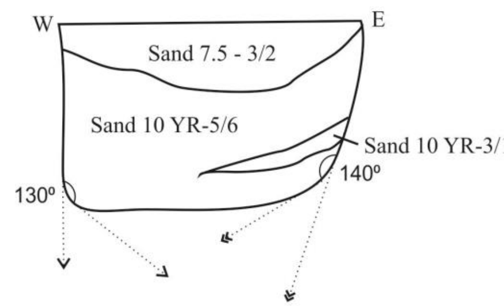
Feature 25 (A)

Plan



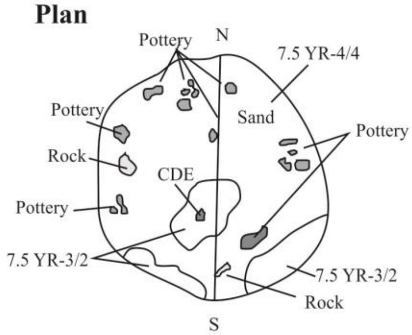
L= 140 cm
W= 130 cm
D= 80 cm

Profile

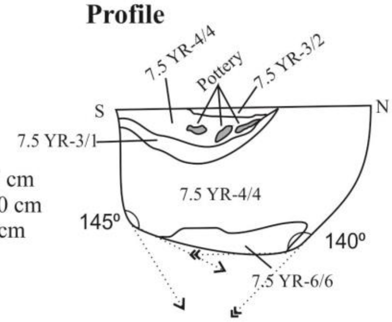


Feature 70 (A)

Plan



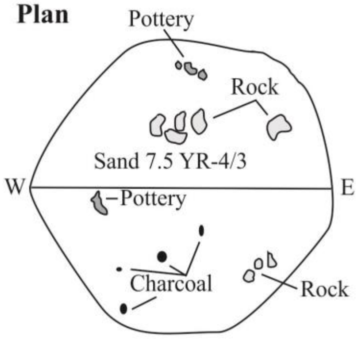
Profile



L= 127 cm
W= 120 cm
D= 71 cm

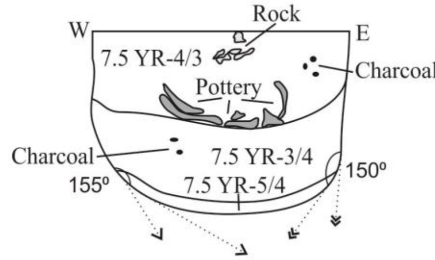
Feature 92 (A)

Plan



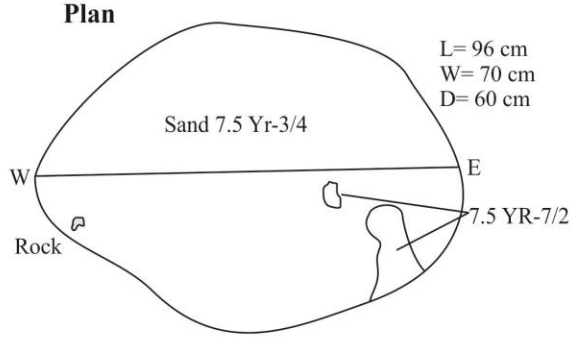
L= 80 cm
W= 79 cm
D= 58 cm

Profile



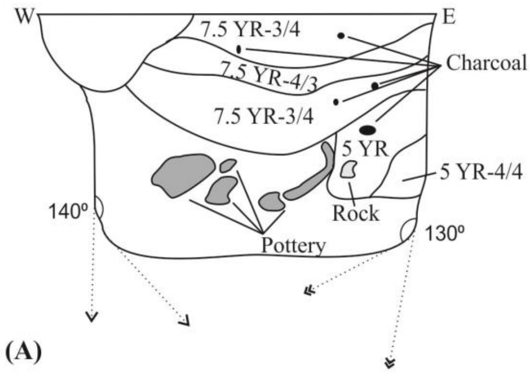
Feature 100 (A)

Plan



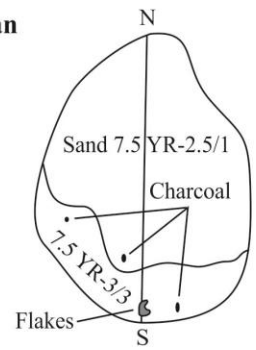
L= 96 cm
W= 70 cm
D= 60 cm

Profile



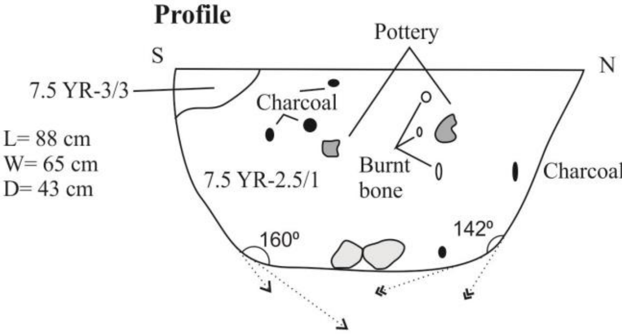
Feature 114 (A)

Plan



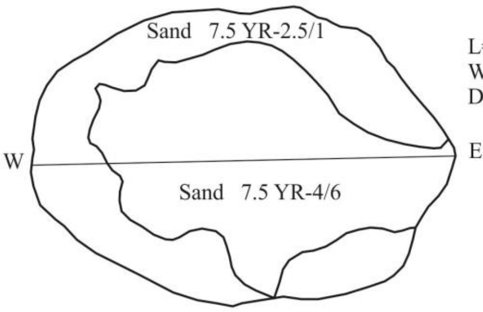
Profile

L= 88 cm
W= 65 cm
D= 43 cm



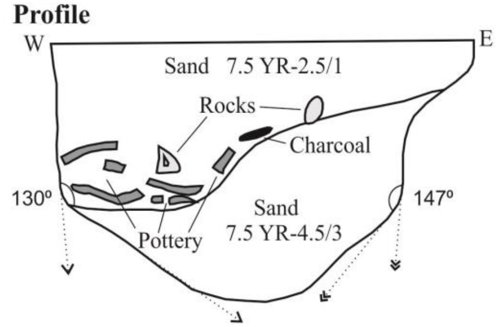
Feature 9 (D)

Plan



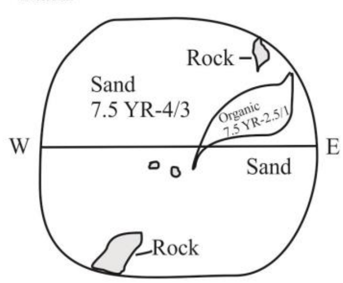
L= 108 cm
W= 130 cm
D= 80 cm

Profile



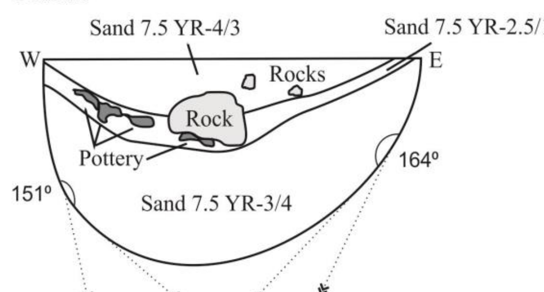
Feature 28 (D)

Plan



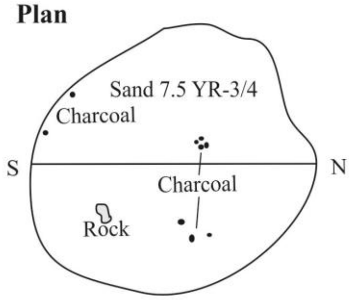
L= 143 cm
W= 150 cm
D= 80 cm

Profile



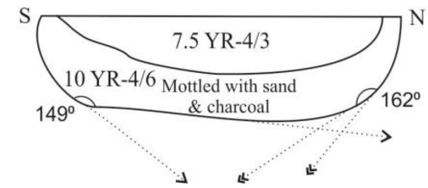
Feature 68 (D)

Plan



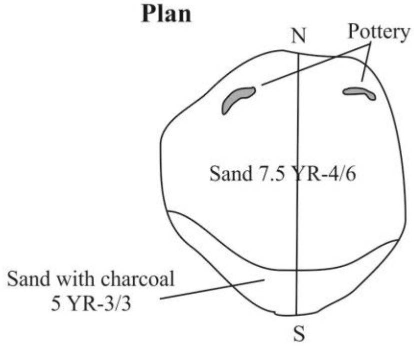
L= 95 cm
W= 88 cm
D= 21 cm

Profile



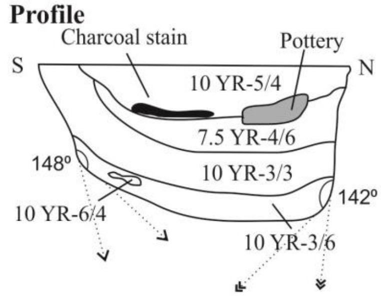
Feature 72 (D)

Plan



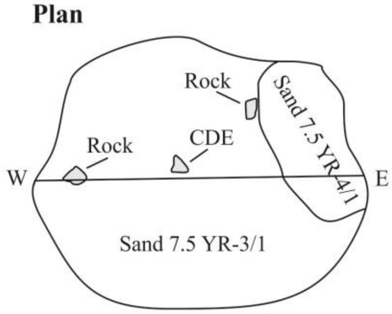
L= 112 cm
W= 99 cm
D= 55 cm

Profile



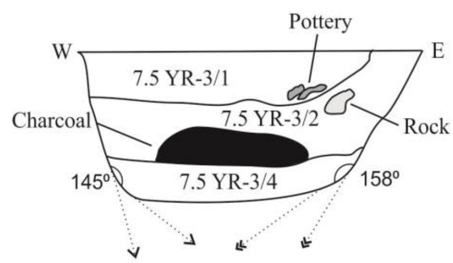
Feature 85 (D)

Plan



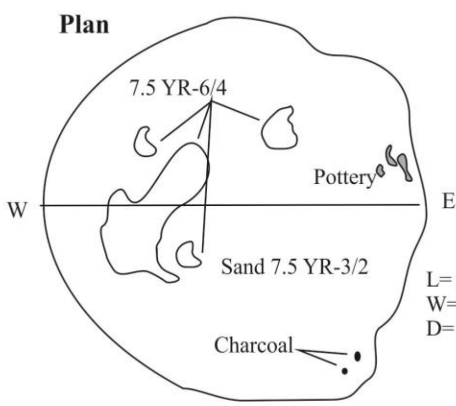
L= 80 cm
W= 95 cm
D= 40 cm

Profile



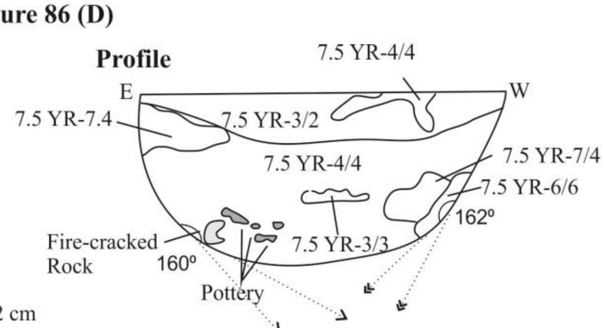
Feature 86 (D)

Plan

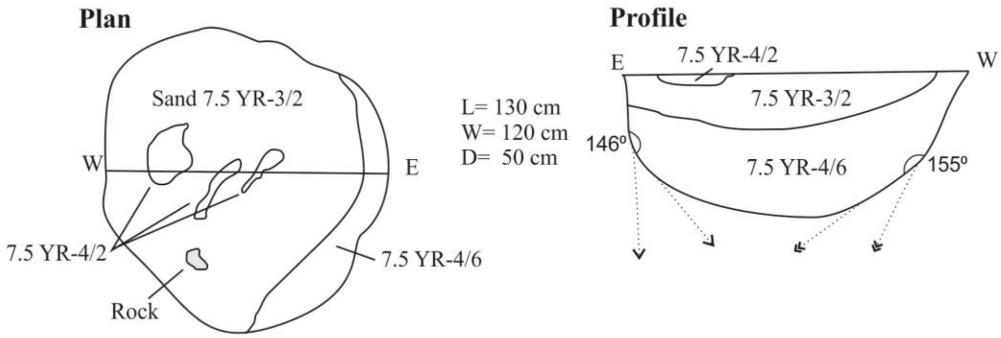


L= 92 cm
W= 90 cm
D= 43 cm

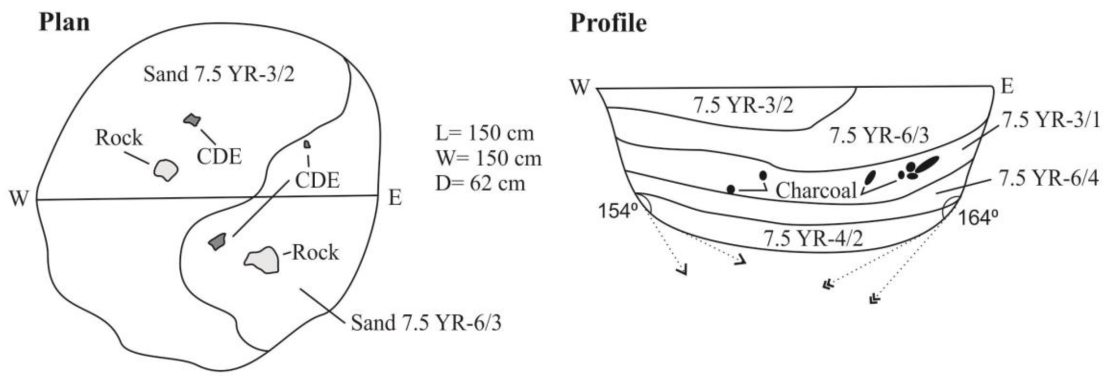
Profile



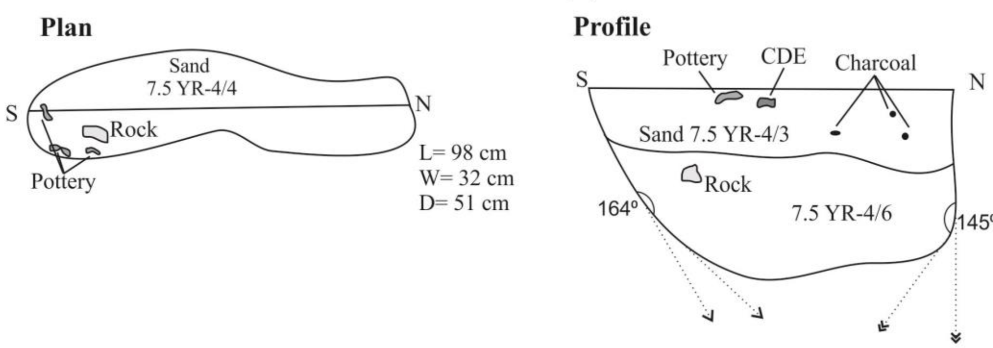
Feature 90 (D)



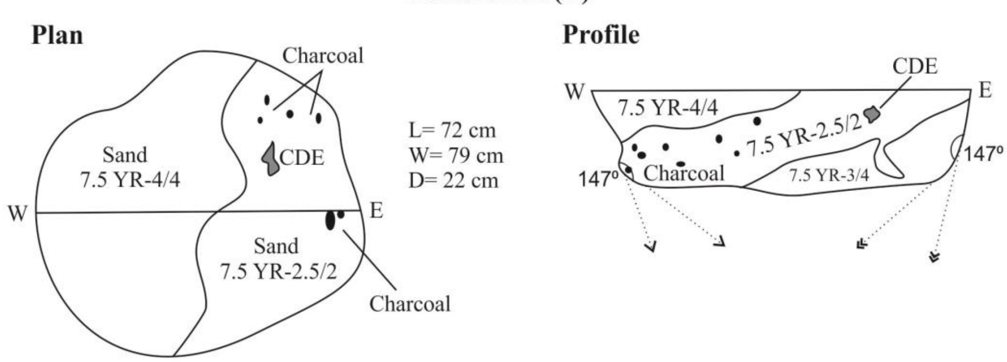
Feature 91 (D)



Feature 104 (D)



Feature 173 (D)



Appendix B: Figura Site Feature Information

Table 29: Figura Site Feature Information

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
1	100	80	70	560.00	5.600	A	circular	2	I	Out	8	1848	4	12	1835	1.14
2	60	63	13	49.14	0.491	B	circular	1	I	Out	1	9	1	0	7	4.85
3	88	90	32	253.44	2.534	D	circular	2	I	Out	1	233	3	6	230	2.81
4	23	27	10	6.21	0.062	B	circular	1	I	Out	8	2	0	0	2	2.70
5	100	112	65	728.00	7.280	A	oval	2	I	Out	8	979	0	10	962	1.72
6	50	65	63	204.75	2.048	A	circular	2	E	Out	9	70	0	1	70	1.03
7	100	90	15	135.00	1.350	D	oval	1	E	Out	9	63	1	2	61	6.00
8	40	40	13	20.80	0.208	B	circular	1	E	Out	9	0	0	0	0	3.08
9	108	130	80	1123.20	11.232	D	oval	2	E	Out	9	646	7	11	629	1.63
10	48	45	50	108.00	1.080	D	circular	2	I	Out	1	42	3	0	38	0.90
11	85	70	62	368.90	3.689	D	circular	3	I	Out	1	260	4	2	243	1.13
12	92	97	65	580.06	5.801	A	circular	4	I	Out	1	435	2	6	426	1.49
13	86	76	35	228.76	2.288	D	circular	1	I	Out	1	180	1	2	170	2.17
14	104	96	49	489.22	4.892	D	circular	1	E	Out	9	151	6	2	145	1.96
15	130	120	44	686.40	6.864	D	circular	1	E	Out	7	50	0	0	50	2.73
16	121	119	52	748.75	7.487	A	circular	2	E	Out	7	145	2	0	141	2.29
17	97	103	50	499.55	4.996	A	circular	1	E	Out	7	229	2	0	226	2.06
18	104	110	49	560.56	5.606	D	circular	1	E	Out	7	0	0	0	0	2.24

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
19	98	110	50	539.00	5.390	D	oval	1	E	Out	7	368	3	3	362	2.20
20	72	70	33	166.32	1.663	D	circular	1	E	Out	7	2	0	0	2	2.12
21	167	150	48	1202.40	12.024	A	oval	2	E	Out	7	556	1	6	553	3.13
22	73	68	17	84.39	0.844	B	oval	1	E	Out	7	311	2	2	309	4.00
23	70	75	54	283.50	2.835	A	circular	4	E	Out	6	602	8	3	575	1.39
24	110	110	82	992.20	9.922	A	circular	3	E	Out	6	1173	10	13	1155	1.34
25	140	130	80	1456.00	14.560	A	circular	2	E	Out	6	259	11	5	544	1.63
26	130	130	65	1098.50	10.985	A	circular	4	E	Out	6	119	0	1	119	2.00
27	103	105	54	584.01	5.840	A	circular	3	E	Out	6	228	5	1	222	1.94
28	143	150	80	1716.00	17.160	D	circular	2	E	Out	6	972	2	3	969	1.88
29	50	200	14	140.00	1.400	D	oval	1	E	Out	6	6	0	0	6	14.29
30	97	70	18	122.22	1.222	D	kidney	1	E	Out	6	104	1	1	64	3.89
31	75	63	12	56.70	0.567	B	circular	1	E	Out	9	0	0	0	0	5.25
33	40	42	16	26.88	0.269	B	circular	1	E	In	H6	17	1	0	16	2.63
35	25	40	11	11.00	0.110	B	oval	1	E	In	H6	0	1	0	14	3.64
37	48	58	7	19.49	0.195	B	circular	1	E	In	H6	51	0	0	51	8.29
38	95	118	71	795.91	7.959	D	circular	2	E	In	H6	35	3	1	32	1.66
39	54	73	7	27.59	0.276	B	kidney	1	E	In	H6	0	0	0	0	10.43
41	22	26	7	4.00	0.040	B	circular	1	E	In	H6	0	0	0	0	3.71
42	26	28	9	6.55	0.066	B	circular	1	E	Out	6	29	0	0	29	3.11

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
43	74	70	22	113.96	1.140	D	circular	1	E	Out	6	98	1	0	99	3.18
44	132	145	56	1071.84	10.718	D	circular	2	E	Out	6	1145	9	3	1132	2.59
45	35	35	8	9.80	0.098	B	circular	1	E	Out	6	8	0	0	8	4.38
46	68	64	8	34.82	0.348	B	circular	1	E	Out	6	492	1	2	490	8.00
47	43	40	8	13.76	0.138	B	circular	1	E	Out	9	13	0	0	13	5.00
48	66	60	32	126.72	1.267	D	circular	2	E	Out	9	6	0	0	6	1.88
49	32	31	33	32.74	0.327	B	circular	1	I	Out	1	22	0	0	22	0.94
50	68	65	19	83.98	0.840	B	circular	1	E	Out	5	3	0	0	3	3.42
51	65	57	24	88.92	0.889	B	circular	1	E	Out	9	30	0	0	30	2.38
54	90	126	34	385.56	3.856	D	irregular	2	I	Out	3	98	0	1	74	3.71
55	128	120	72	1105.92	11.059	A	circular	5	I	Out	3	451	5	3	445	1.67
56	88	89	49	383.77	3.838	A	circular	1	E	In	H6	3	0	0	3	1.82
57	116	119	50	690.20	6.902	D	circular	2	E	Out	H6	144	1	0	143	2.38
58	43	40	16	27.52	0.275	B	circular	1	E	Out	9	3	0	0	3	2.50
59	70	68	50	238.00	2.380	D	circular	3	E	Out	9	32	0	1	32	1.36
60	60	92	15	82.80	0.828	B	oval	1	E	Out	9	129	0	2	128	6.13
61	83	118	16	156.70	1.567	D	kidney	1	I	Out	8	10	0	0	10	7.38
62	90	80	9	64.80	0.648	B	irregular	1	I	In	H1	12	0	0	12	8.89
63	72	70	31	156.24	1.562	D	circular	1	I	In	H1	337	2	5	314	2.26
64	60	60	18	64.80	0.648	B	kidney	1	I	Out	H2	0	0	0	0	3.33

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
65	70	56	19	74.48	0.745	B	kidney	1	I	In	H2	216	1	0	183	2.95
66	90	90	30	243.00	2.430	D	irregular	2	I	Out	8	28	0	0	28	3.00
67	162	113	50	915.30	9.153	A	oval	3	I	Out	2	114	1	2	112	2.26
68	95	88	21	175.56	1.756	D	oval	2	I	Out	2	2	0	0	2	4.19
69	107	76	60	487.92	4.879	A	oval	2	I	Out	2	109	0	2	109	1.27
70	127	120	71	1082.04	10.820	A	circular	1	I	Out	2	714	4	1	710	1.69
71	146	70	59	602.98	6.030	D	oval	2	I	Out	2	0	0	0	0	1.19
72	112	99	55	609.84	6.098	D	circular	3	I	Out	2	583	0	1	583	1.80
73	65	65	29	122.53	1.225	D	irregular	1	I	In	H2	0	0	0	0	2.24
74	40	38	15	22.80	0.228	B	circular	1	I	In	H2	0	0	0	0	2.53
75	35	35	14	17.15	0.172	B	circular	1	I	In	H2	8	0	0	8	2.50
76	38	33	9	11.29	0.113	B	circular	1	I	In	H2	105	0	0	105	3.67
78	54	42	21	47.63	0.476	B	kidney	1	I	In	H2	551	1	0	550	2.00
79	43	34	15	21.93	0.219	B	oval	1	I	In	H2	198	1	1	196	2.27
80	83	69	32	183.26	1.833	D	irregular	1	I	In	H2	40	0	0	40	2.16
81	53	40	9	19.08	0.191	B	oval	1	I	In	H2	0	0	0	0	4.44
82	35	32	11	12.32	0.123	B	circular	1	I	In	H2	54	0	0	82	2.91
83	120	90	93	1004.40	10.044	D	oval	3	I	Out	H2	279	3	2	269	0.97
84	59	59	23	80.06	0.801	B	circular	1	I	Out	8	29	0	0	29	2.57
85	80	95	40	304.00	3.040	D	circular	3	E	Out	H6	371	1	1	367	2.38

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
86	92	90	43	356.04	3.560	D	circular	2	I	In	H1	1764	3	19	1756	2.09
87	41	40	37	60.68	0.607	B	circular	1	I	Out	8	0	0	0	0	1.08
88	63	42	23	60.86	0.609	B	oval	1	I	Out	1	0	0	0	0	1.83
89	56	52	20	58.24	0.582	B	circular	3	I	Out	1	112	2	4	110	2.60
90	130	120	50	780.00	7.800	D	circular	2	I	Out	2	0	0	0	0	2.40
91	150	150	62	1395.00	13.950	D	circular	4	E	Out	6	1305	9	9	1296	2.42
92	80	79	58	366.56	3.666	A	circular	3	I	Out	1	369	0	6	513	1.36
93	90	80	28	201.60	2.016	D	circular	2	I	Out	1	461	3	8	492	2.86
94	165	143	101	2383.10	23.831	D	oval	4	I	Out	1	3440	4	17	3416	1.42
95	113	109	36	443.41	4.434	D	circular	2	I	Out	1	396	2	8	393	3.03
96	50	36	14	25.20	0.252	B	oval	1	I	Out	1	0	0	0	0	2.57
97	70	44	43	132.44	1.324	A	oval	2	I	Out	1	4	0	0	4	1.02
98	269	120	66	2130.48	21.305	D	irregular	3	I	Out	1	2134	8	3	2123	1.82
99	28	30	10	8.40	0.084	B	circular	1	I	Out	1	0	0	0	0	3.00
100	96	70	60	403.20	4.032	A	oval	4	I	Out	1	922	1	2	918	1.17
101	32	32	11	11.26	0.113	B	circular	2	I	In	H2	25	0	0	25	2.91
102	135	117	23	363.29	3.633	D	oval	1	I	Out	1	608	2	6	598	5.09
103	88	60	50	264.00	2.640	D	oval	2	I	Out	1	77	0	0	73	1.20
104	98	32	51	159.94	1.599	D	oval	2	I	Out	1	2227	6	1	2193	0.63
105	25	25	7	4.38	0.044	B	circular	1	I	Out	1	0	0	0	0	3.57

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
107	63	60	20	75.60	0.756	B	circular	1	I	Out	8	0	0	0	0	3.00
108	34	34	19	21.96	0.220	B	circular	1	I	In	H4	0	0	0	0	1.79
109	44	42	10	18.48	0.185	B	circular	1	I	In	H4	68	0	0	68	4.20
110	40	34	12	16.32	0.163	B	circular	1	I	In	H4	0	0	0	0	2.83
111	40	31	12	14.88	0.149	B	circular	1	I	In	H4	6	0	1	6	2.58
112	28	28	13	10.19	0.102	B	circular	1	I	In	H4	0	0	0	0	2.15
113	30	28	7	5.88	0.059	B	circular	1	I	In	H4	0	0	0	0	4.00
114	88	65	43	245.96	2.460	A	oval	1	I	In	H3	379	0	7	379	1.51
117	88	88	19	147.14	1.471	D	circular	1	I	In	H3	10	0	0	10	4.63
118	220	134	39	1149.72	11.497	D	oval	1	I	Out	8	0	0	0	0	3.44
119	110	99	23	250.47	2.505	D	irregular	1	I	Out	8	99	2	2	95	4.30
120	40	38	12	18.24	0.182	B	circular	1	E	Out	9	0	0	0	0	3.17
121	61	56	17	58.07	0.581	B	circular	1	I	Out	1	1	0	0	1	3.29
122	88	77	19	128.74	1.287	D	oval	1	I	Out	3	1	0	0	1	4.05
124	109	98	32	341.82	3.418	D	kidney	2	I	Out	1	0	0	0	0	3.06
125	128	60	24	184.32	1.843	D	irregular	1	I	Out	1	1	0	0	1	2.50
126	123	105	25	322.88	3.229	D	irregular	1	I	Out	1	0	0	0	0	4.20
128	75	40	17	51.00	0.510	B	oval	1	I	Out	3	0	0	0	0	2.35
131	188	186	30	1049.04	10.490	D	irregular	1	E	Out	5	0	0	0	0	6.20
132	123	55	23	155.60	1.556	D	oval	1	E	Out	5	0	0	0	0	2.39

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
133	100	77	35	269.50	2.695	D	oval	3	E	Out	5	1	0	0	1	2.20
134	103	70	20	144.20	1.442	D	irregular	2	E	Out	5	24	0	0	24	3.50
136	184	108	22	437.18	4.372	D	irregular	1	E	Out	4	0	0	0	0	4.91
138	60	37	23	51.06	0.511	B	circular	1	E	Out	4	2	0	0	2	1.61
139	150	105	37	582.75	5.828	D	irregular	1	E	Out	9	0	0	0	0	2.84
140	115	80	61	561.20	5.612	A	irregular	2	E	Out	9	31	0	0	31	1.31
141	206	134	52	1435.41	14.354	D	irregular	1	E	Out	9	2	0	0	2	2.58
142	70	59	14	57.82	0.578	B	oval	1	E	Out	9	4	0	0	1	4.21
143	120	107	55	706.20	7.062	D	irregular	1	E	Out	9	3	0	0	3	1.95
144	168	68	13	148.51	1.485	D	irregular	1	E	Out	4	0	0	0	0	5.23
145	178	112	44	877.18	8.772	D	irregular	1	E	Out	4	0	0	0	0	2.55
147	333	162	82	4423.57	44.236	D	irregular	1	E	Out	4	72	1	0	71	1.98
148	253	123	25	777.98	7.780	D	irregular	1	E	Out	4	0	0	0	0	4.92
149	312	144	32	1437.70	14.377	D	irregular	1	E	Out	4	0	0	0	0	4.50
150	95	62	26	153.14	1.531	D	oval	2	E	Out	4	0	0	0	0	2.38
151	210	121	47	1194.27	11.943	D	irregular	2	E	Out	9	119	3	0	116	2.57
152	60	58	33	114.84	1.148	D	circular	2	E	Out	4	0	0	0	0	1.76
154	120	103	38	469.68	4.697	D	irregular	1	E	Out	9	0	0	0	0	2.71
155	166	125	40	830.00	8.300	D	oval	1	E	Out	5	1	1	0	0	3.13
156	37	44	26	42.33	0.423	B	irregular	1	E	Out	9	2	0	0	2	1.69

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
157	73	53	25	96.73	0.967	B	irregular	1	E	Out	5	3	0	0	3	2.12
160	81	70	56	317.52	3.175	D	irregular	3	E	Out	6	1	0	0	1	1.25
162	84	84	19	134.06	1.341	D	circular	1	E	Out	9	5	0	0	5	4.42
163	92	82	34	256.50	2.565	D	circular	1	E	Out	9	1	0	0	1	2.41
164	356	207	23	1694.92	16.949	D	irregular	1	E	Out	9	22	0	0	22	9.00
165	196	108	51	1079.57	10.796	D	irregular	2	E	Out	9	265	0	4	265	2.12
166	89	66	17	99.86	0.999	B	oval	1	I	Out	8	0	0	0	0	3.88
167	57	43	11	26.96	0.270	B	irregular	1	I	Out	8	0	0	0	0	3.91
168	224	135	21	635.04	6.350	D	irregular	1	E	Out	9	1	0	0	1	6.43
169	180	85	30	459.00	4.590	D	oval	2	E	Out	9	0	0	0	0	2.83
170	45	36	10	16.20	0.162	B	oval	1	I	Out	8	0	0	0	0	3.60
171	80	72	14	80.64	0.806	B	oval	1	I	Out	8	3	0	0	3	5.14
172	125	70	55	481.25	4.813	D	oval	2	I	Out	1	0	0	0	0	1.27
173	72	79	22	125.14	1.251	D	circular	2	I	Out	1	166	5	0	161	3.59
174	143	64	18	164.74	1.647	D	oval	1	I	In	H4	0	0	0	0	3.56
175	122	103	19	238.75	2.388	D	oval	1	I	In	H4	0	0	0	0	5.42
176	46	32	33	48.58	0.486	B	circular	1	I	In	H4	0	0	0	0	0.97
177	24	20	7	3.36	0.034	B	circular	1	I	In	H4	0	0	0	0	2.86
178	69	60	23	95.22	0.952	B	circular	1	I	Out	1	2	0	0	2	2.61
179	210	140	72	2116.80	21.168	D	irregular	4	I	Out	8	5	0	0	5	1.94

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
180	56	38	12	25.54	0.255	B	oval	1	E	Out	9	0	0	0	0	3.17
181	59	49	14	40.47	0.405	B	oval	1	E	Out	9	0	0	0	0	3.50
182	130	116	9	135.72	1.357	D	oval	1	I	Out	8	4	0	0	4	12.89
183	48	48	8	18.43	0.184	B	oval	1	I	Out	1	0	0	0	0	6.00
184	99	70	47	325.71	3.257	D	oval	1	I	In	H4	0	0	0	0	1.49
185	106	68	54	389.23	3.892	D	oval	4	I	In	H4	0	0	0	0	1.26
187	69	65	13	58.31	0.583	B	circular	1	I	In	H3	0	0	0	0	5.00
188	68	59	17	68.20	0.682	B	circular	1	E	Out	9	0	0	0	0	3.47
189	83	58	10	48.14	0.481	B	irregular	1	E	Out	9	0	0	0	0	5.80
190	77	48	13	48.05	0.480	B	oval	1	I	Out	8	0	0	0	0	3.69
191	48	46	12	26.50	0.265	B	circular	1	I	Out	H3	0	0	0	0	3.83
192	72	68	21	102.82	1.028	D	circular	2	I	Out	8	0	0	0	0	3.24
195	57	26	12	17.78	0.178	B	oval	1	I	Out	H3	0	0	0	0	2.17
196	72	58	25	104.40	1.044	D	oval	1	I	Out	8	0	0	0	0	2.32
197	46	40	21	38.64	0.386	B	circular	1	I	Out	H3	0	0	0	0	1.90
198	34	34	12	13.87	0.139	B	circular	1	I	Out	H3	0	0	0	0	2.83
199	154	150	20	462.00	4.620	D	irregular	1	I	Out	H3	0	0	0	0	7.50
202	45	45	8	16.20	0.162	B	irregular	1	I	Out	H3	0	0	0	0	5.63
203	303	243	43	3166.05	31.660	D	oval	2	I	Out	8	0	0	0	0	5.65
204	32	30	12	11.52	0.115	B	circular	1	I	Out	3	0	0	0	0	2.50

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
205	42	33	18	24.95	0.249	B	irregular	1	I	Out	H2	11	0	0	11	1.83
206	70	36	10	25.20	0.252	B	oval	1	I	Out	3	0	0	0	0	3.60
207	68	44	11	32.91	0.329	B	irregular	1	I	Out	3	0	0	0	0	4.00
209	104	70	46	334.88	3.349	D	irregular	1	I	Out	2	0	0	0	0	1.52
210	69	28	27	52.16	0.522	B	oval	2	I	In	H2	53	0	0	53	1.04
214	33	32	8	8.45	0.084	B	circular	2	I	Out	8	0	0	0	0	4.00
215	80	70	32	179.20	1.792	D	kidney	1	I	Out	8	0	0	0	0	2.19
216	106	48	13	66.14	0.661	B	irregular	1	I	Out	8	0	0	0	0	3.69
217	120	91	14	152.88	1.529	D	oval	1	I	Out	8	0	0	0	0	6.50
218	64	60	26	99.84	0.998	B	circular	1	I	Out	8	2	0	0	2	2.31
220	120	58	33	229.68	2.297	D	irregular	1	I	Out	1	0	0	0	0	1.76
223	45	45	10	20.25	0.203	B	circular	1	I	Out	3	0	0	0	0	4.50
224	221	140	38	1175.72	11.757	D	irregular	1	I	Out	3	0	0	0	0	3.68
225	89	80	28	199.36	1.994	D	circular	1	I	Out	3	0	0	0	0	2.86
226	109	77	25	209.83	2.098	D	irregular	1	I	Out	3	0	0	0	0	3.08
227	84	92	21	162.29	1.623	D	irregular	1	I	Out	8	0	0	0	0	4.38
228	99	99	50	490.05	4.901	D	circular	2	E	In	H6	73	3	1	70	1.98
230	102	87	14	124.24	1.242	D	circular	1	E	Out	H6	0	0	0	0	6.21
231	38	37	10	14.06	0.141	B	circular	1	I	Out	1	0	0	0	0	3.70
233	123	100	32	393.60	3.936	D	circular	3	E	Out	9	1	0	0	1	3.13

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
234	56	34	17	32.37	0.324	B	circular	1	E	Out	9	0	0	0	0	2.00
237	44	38	12	20.06	0.201	B	circular	1	I	Out	1	2	0	0	2	3.17
238	40	34	20	27.20	0.272	B	circular	1	I	Out	1	0	0	0	0	1.70
239	77	64	28	137.98	1.380	D	circular	1	E	Out	9	0	0	0	0	2.29
240	104	96	30	299.52	2.995	D	circular	1	E	Out	H6	0	0	0	0	3.20
241	200	80	24	384.00	3.840	D	kidney	1	E	In	H6	1	0	0	1	3.33
243	39	26	13	13.18	0.132	B	oval	1	I	Out	1	1	0	0	1	2.00
244	110	104	24	274.56	2.746	D	oval	1	I	Out	1	1	0	0	1	4.33
245	223	148	49	1617.20	16.172	D	kidney	1	I	Out	H1	1	0	0	1	3.02
246	58	58	12	40.37	0.404	B	circular	1	I	Out	1	0	0	0	0	4.83
247	38	34	19	24.55	0.245	B	oval	1	I	Out	1	0	0	0	0	1.79
248	77	74	17	96.87	0.969	B	circular	1	I	Out	1	0	0	0	0	4.35
249	29	23	20	13.34	0.133	B	oval	1	I	Out	8	1	0	0	1	1.15
250	52	33	20	34.32	0.343	B	oval	1	I	Out	1	0	0	0	0	1.65
251	47	43	17	34.36	0.344	B	circular	2	I	Out	8	0	0	0	0	2.53
252	160	77	25	308.00	3.080	D	kidney	1	I	Out	1	0	0	0	0	3.08
253	62	47	43	125.30	1.253	D	circular	1	E	Out	9	0	0	0	0	1.09
254	42	36	19	28.73	0.287	B	oval	1	I	Out	8	0	0	0	0	1.89
255	198	197	44	1716.26	17.163	D	irregular	2	I	Out	8	5	0	0	5	4.48
256	114	100	31	353.40	3.534	D	irregular	2	I	Out	1	17	0	0	17	3.23

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
257	48	46	23	50.78	0.508	B	circular	2	I	Out	1	0	0	0	0	2.00
259	71	38	10	26.98	0.270	B	oval	1	E	Out	9	0	0	0	0	3.80
260	32	26	7	5.82	0.058	B	circular	1	E	Out	9	0	0	0	0	3.71
261	28	26	15	10.92	0.109	B	circular	1	I	Out	8	1	0	0	1	1.73
263	150	125	33	618.75	6.188	D	kidney	1	I	Out	1	2	0	0	2	3.79
264	93	99	21	193.35	1.933	D	oval	1	I	Out	8	0	0	0	0	4.71
265	51	43	7	15.35	0.154	B	circular	1	I	Out	8	0	0	0	0	6.14
267	32	32	15	15.36	0.154	B	circular	1	I	Out	3	0	0	0	0	2.13
268	38	36	16	21.89	0.219	B	circular	1	I	Out	3	0	0	0	0	2.25
269	80	79	26	164.32	1.643	D	irregular	1	I	Out	3	7	0	0	7	3.04
270	44	36	22	34.85	0.348	B	circular	1	I	Out	3	0	0	0	0	1.64
271	62	49	14	42.53	0.425	B	oval	1	I	Out	3	1	0	0	0	3.50
272	29	27	9	7.05	0.070	B	circular	1	I	Out	1	0	0	0	0	3.00
273	84	80	16	107.52	1.075	D	irregular	1	I	In	H1	0	0	0	0	5.00
274	59	54	12	38.23	0.382	B	circular	1	I	In	H1	0	0	0	0	4.50
276	88	50	12	52.80	0.528	B	irregular	1	I	Out	3	0	0	0	0	4.17
278	150	140	26	546.00	5.460	D	circular	1	I	Out	1	2	0	0	2	5.38
279	65	59	17	65.20	0.652	B	circular	1	E	Out	9	0	0	0	0	3.47
280	42	42	11	19.40	0.194	B	circular	1	I	Out	1	3	0	0	3	3.82
281	102	54	17	93.64	0.936	B	oval	1	E	In	H6	0	0	0	0	3.18

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
282	158	140	62	1371.44	13.714	D	irregular	1	I	Out	1	4	0	0	4	2.26
283	92	64	29	170.75	1.708	D	irregular	1	I	Out	1	0	0	0	0	2.21
284	105	56	12	70.56	0.706	B	oval	1	I	Out	8	0	0	0	0	4.67
285	21	17	11	3.93	0.039	B	circular	1	I	In	H4	0	0	0	0	1.55
286	52	34	9	15.91	0.159	B	irregular	1	I	In	H4	0	0	0	0	3.78
287	47	43	12	24.25	0.243	B	circular	1	I	In	H4	6	1	0	5	3.58
288	22	16	12	4.22	0.042	B	irregular	1	I	In	H4	1	0	0	1	1.33
290	30	29	9	7.83	0.078	B	circular	1	I	Out	8	0	0	0	0	3.22
291	75	55	17	70.13	0.701	B	irregular	1	I	In	H2	0	0	0	0	3.24
292	92	73	8	53.73	0.537	B	irregular	1	I	In	H1	0	0	0	0	9.13
294	56	73	12	49.06	0.491	B	oval	1	I	Out	8	26	0	0	26	6.08
295	37	33	20	24.42	0.244	B	circular	1	I	Out	H3	0	0	0	0	1.65
296	41	37	5	7.59	0.076	B	circular	1	I	Out	H4	0	0	0	0	7.40
297	36	34	8	9.79	0.098	B	circular	1	I	Out	H4	0	0	0	0	4.25
298	71	45	36	115.02	1.150	D	oval	1	I	In	H4	3	0	0	3	1.25
301	45	44	6	11.88	0.119	B	irregular	2	I	In	H2	0	0	0	0	7.33
302	61	42	40	102.48	1.025	A	oval	2	I	In	H1					1.05
303	52	45	25	58.50	0.585	B	circular	1	I	Out	1	0	0	0	0	1.80
304	32	30	24	23.04	0.230	B	circular	2	I	Out	1	1	1	0	0	1.25
305	62	40	23	57.04	0.570	B	oval	1	I	Out	1	0	0	0	0	1.74

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts	# of Tools	# of Vessels	# of Refuse	Width-Depth Ratio
307	59	48	9	25.49	0.255	B	irregular	1	I	Out	8	0	0	0	0	5.33
308	80	68	14	76.16	0.762	B	kidney	1	I	In	H2	0	0	0	0	4.86
310	49	40	14	27.44	0.274	B	circular	1	I	In	H4	2	0	1	1	2.86
311	47	46	10	21.62	0.216	B	circular	1	I	In	H4	0	0	0	0	4.60
312	38	32	12	14.59	0.146	B	circular	1	I	In	H4	0	0	0	0	2.67
313	22	20	6	2.64	0.026	B	circular	1	I	In	H4	0	0	0	0	3.33
314	40	36	8	11.52	0.115	B	circular	1	I	In	H4	0	0	0	0	4.50
315	49	47	10	23.03	0.230	B	circular	1	I	In	H4	1	0	0	0	4.70
137 A	60	60	12	43.20	0.432	B	circular	1	E	Out	6	0	0	0	0	5.00
137 B	96	94	38	342.91	3.429	D	circular	2	E	Out	6	0	0	0	0	2.47
77 A	75	56	13	54.60	0.546	B	circular	1	I	In	H2	0	0	0	0	4.31
77 B	77	64	14	68.99	0.690	B	circular	1	I	In	H2	0	0	0	0	4.57
94 B	54	37	19	37.96	0.380	B	oval	1	I	Out	1	694	1	0	687	1.95

Table 30: Figura Site Feature Information Not Included in Analysis

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts
32	762	320	90	21945.60	219.456	midden	irregular		E	Out	9	1391
34	32	60	5	9.60	0.096	C	oval	1	E	In	H6	0
52	58	53	40	122.96	1.230	E	circular	1	E	Out	9	12
53	713	650	71	32904.95	329.050	midden	irregular		I	Out	3	86
106	56	34	7	13.33	0.133	E	oval	1	I	Out	1	23
115	60	55	12	39.60	0.396	F	circular	1	I	In	H3	35
116	56	51	20	57.12	0.571	F	circular	1	I	In	H3	777
123	185	119	10	220.15	2.202	C	oval	1	I	In	H3	0
127	334	220	54	3967.92	39.679	E	irregular	4	I	Out	1	135
129	195	110	9	193.05	1.931	C	irregular	1	I	Out	8	0
130	228	178	27	1095.77	10.958	E	irregular	1	I	Out	8	6
146	83	71	1	5.89	0.059	E	irregular	1	E	Out	4	14
159	30	17	34	17.34	0.173	E	oval	1	E	Out	9	0
161	662	441	70	20435.94	204.359	midden	irregular		E	Out	9	50
186	150	50	17	127.50	1.275	E	irregular	1	I	In	H3	0
193	78	70	4	21.84	0.218	C	circular	1	I	Out	8	0
208	202	160	16	517.12	5.171	E	irregular	1	I	Out	8	1
211	72	50	11	39.60	0.396	C	oval	1	I	In	H2	0
212	74	68	7	35.22	0.352	C	oval	1	I	In	H2	0

Feature #	Length (cm)	Width (cm)	Depth (cm)	Volume (L)	Hecolitre (hL)	Feature Type	Plan Shape	# of Layers	Interior/Exterior Palisade	In/Out of House	Area	# of Artifacts
213	87	50	1	4.35	0.044	E	irregular	1	I	Out	8	0
229	18	18	33	10.69	0.107	E	circular	3	E	In	H6	0
232	97	76	20	147.44	1.474	E	oval	1	E	Out	9	0
235	165	134	27	596.97	5.970	E	kidney	2	E	Out	9	11
266	226	226	3	153.23	1.532	C	irregular	1	I	Out	1	3
275	40	34	42	57.12	0.571	E	circular	1	I	Out	3	3
277	104	71	12	88.61	0.886	C	oval	1	I	Out	3	0
299	34	34	2	2.31	0.023	E	circular	1	I	In	H4	0
300	35	33	4	4.62	0.046	C	circular	1	I	In	H4	0
306	58	32	8	14.85	0.148	C	oval	1	E	Out	9	0

Curriculum Vitae

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	The University of Western Ontario London, Ontario, Canada 2010-2017 M.A.
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Honours and Awards:	Western Graduate Research Scholarship 2010-2012
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